



**BUSHFIRE ATTACK LEVEL**

**FOR**

**FUTURE DWELLINGS**

**WITHIN**

**STAGE 45A NORTHLAKES ESTATE**



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### **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.*



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## Executive Summary

This report provides an assessment of the Bushfire Attack Level (BAL) in accordance with AS3959-2009 Construction of Buildings in Bushfire Prone Areas for Stage 45A within the Northlakes Estate.

This report and mapping are not to be used to place wholesale restrictions on lots reflecting the resulting BAL mapping presented within. Future development of surrounding stages may result in lower BALs than detailed in this report.

This BAL report has shown that any future dwellings within the site will be able to meet the requirements of both AS3959-2009 and the addendum to Appendix 3 of Planning PBP 2006 (NSW Rural Fire Service NSW) and will meet complying development under the Code SEPP if the other development standards as detailed within the Codes SEPP are met.



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*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.*

*It should be noted that upon lodgement of a Development Application (DA) with Council or Rural Fires Service they may recommend additional construction requirements (BALs).*

*Although every care has been taken in the preparation of this report, North Lakes Estate and Firebird ecoSultants Pty Ltd accept no responsibility resulting from the use of this information.*



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## Terms & Abbreviations

<b>Abbreviation</b>	<b>Meaning</b>
APZ	Asset Protection Zone
AS2419 -2005	Australian Standard – Fire Hydrant Installations
AS3959-2009	Australian Standard – Construction of Buildings in Bush Fire Prone Areas
BAL	Bushfire Attack Level
BCA	Building Code of Australia
BPA	Bush Fire Prone Area (Also Bushfire Prone Land)
BPL Map	Bush Fire Prone Land Map
BPMS	Bush Fire Protection Measures
<i>EPA Act</i>	<i>NSW Environmental Planning and Assessment Act 1979</i>
FDI	Fire Danger Index
FMP	Fuel Management Plan
ha	hectare
IPA	Inner Protection Area
LMCC	Lake Macquarie City Council
LGA	Local Government Area
OPA	Outer Protection Area
PBP	Planning for Bushfire Protection 2006
RF Act	Rural Fires Act 1997
RF Regulation	Rural Fires Regulation



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# I INTRODUCTION

Firebird ecoSultants Pty Ltd has been engaged by North Lakes Pty Ltd to undertake a Bushfire Attack Level (BAL) report for Stage 45A within the Northlakes Estate hereafter referred to as the “site”. Refer to Appendix A for Sales Plan.

This BAL report assess the application of Australian Standard AS3959-2009 ‘Construction of Buildings in Bushfire Prone Land’ and Appendix 3 of Planning for Bushfire Protection 2006 (PBP, 2006). This report has been prepared to provide guidance to prospective purchasers of what Bushfire Attack Levels (BALs) may be required for future dwellings within the site.

## I.1 Site Particulars

<b>Locality:</b>	Stage 45A Northlakes Estate
<b>LGA:</b>	Lake Macquarie City Council (LMCC)
<b>Forest Danger Index:</b>	100
<b>Current Land Use:</b>	Approved subdivision



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## 2 METHODOLOGY

The Australian Standard for assessing the BAL and providing the detailed requirements for construction has been reviewed and amended with the latest version being adopted for use in bushfire prone areas of NSW in May 2010. This version is titled AS3959-2009 'Construction of Buildings in Bushfire Prone Areas' (standards Australia 2009, incorporating amendment 1 (November 2009) and amendment 2 (February 2011), with amendment 2 being used in this assessment.

In addition, the NSW method of determining the bushfire attack level, found in Appendix 3 of the document 'Planning for Bushfire Protection 2006' (NSW Rural Fire Service 2006) has also been reviewed and amended to come into line with the process within AS 3959. Therefore, in NSW the methodology with AS3959 is to be used to determine the bushfire attack level.

### 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 via a site inspection.

### 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.
- On site confirmation of slope measurements.



## 3 SITE ASSESSMENT

The following assessment has been undertaken in accordance with the requirements of PBP (RFS, 2006) and AS3959-2009.

### 3.1 Vegetation and Slope Assessment

An assessment of the slope affecting the bushfire behaviour was undertaken for a distance of 100m from the edge of the lot boundaries in the direction of the bushfire hazard. The slopes leading away from the site have been evaluated to identify both the average slope and by identifying the maximum slope present. These values help determine the level of gradient which will most significantly influence the fire behaviour of the site. Refer to Table 1 for Vegetation and Slope Assessment.

**Table 1 –Vegetation & Slope Assessment**

<b>Direction from Site</b>	<b>Vegetation Classification</b>	<b>Effective Slope</b>
North	Open Forest associated with the drainage reserve	Flat / upslope
East	N/A – Managed land	N/A
South	N/A – Managed land	N/A
West	N/A – Managed land	N/A





## 4 BUSHFIRE ATTACK ASSESSMENT

### 4.1 Bushfire Attack Assessment

To determine the bush fire attack and required Bushfire Attack Level (BAL) for the proposed subdivision the following steps were followed:

1. Determination of the vegetation types within 100m of the site, as assessed in section 3 of this report.
2. Determination of the distance between the vegetation and future dwellings has been assessed in section 4.2 of this report.
3. Determination of the effective slope as assessed in section 3 of this report.
4. A FDI of 100 was determined for LMCC LGA.

### 4.2 Determination of Bushfire Attack Levels

The results from the above steps were used to calculate the required BAL using Table 2.4.2 of AS3959-2009. The temporary 40mm APZs to the west of the site until such time this land is developed and the temporary APZs to the north of the site until such time this land is developed has been used in this assessment. Refer to Figure 4-1 BAL Map showing these APZs.

The results from this bush fire attack assessment are detailed below in Table 4-1– Bushfire Attack Level (BAL) Assessment and Figure 4-1 Bushfire Attack Level Map.

**Table 4-1: Bushfire Attack Level Assessment**

Lot Number	Vegetation Type & Direction from future dwellings	Average Slope of Land (degrees)	Separation Distance from Identified Vegetation	Bushfire Attack Level (BAL)	Construction Section
Lot 4551	Open Forest to the North	Upslope / cross-slope	35 - 48m	BAL-19	Sect 3 & 6 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
			>48m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3

Lot Number	Vegetation Type & Direction from future dwellings	Average Slope of Land (degrees)	Separation Distance from Identified Vegetation	Bushfire Attack Level (BAL)	Construction Section
Lot 4552	Open Forest to the North	Upslope / cross-slope	35 -48m	BAL-19	Sect 3 & 6 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
			>48m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 4553	Open Forest to the North	Upslope / cross-slope	>48m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 4554	Open Forest to the North	Upslope / cross-slope	>48m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 4555	Open Forest to the North	Upslope / cross-slope	>48m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 4556	Open Forest to the North	Upslope / cross-slope	>100m	BAL-LOW	No specific construction requirements in accordance with AS3959-2009
Lot 4557	Open Forest to the North	Upslope / cross-slope	>100m	BAL-LOW	No specific construction requirements in accordance with AS3959-2009
Lot 4558	Open Forest to the North	Upslope / cross-slope	>100m	BAL-LOW	No specific construction requirements in accordance with AS3959-2009
Lot 4559	Open Forest to the North	Upslope / cross-slope	>100m	BAL-LOW	No specific construction requirements in accordance with AS3959-2009
Lot 4560	Open Forest to the North	Upslope / cross-slope	>100m	BAL-LOW	No specific construction



Lot Number	Vegetation Type & Direction from future dwellings	Average Slope of Land (degrees)	Separation Distance from Identified Vegetation	Bushfire Attack Level (BAL)	Construction Section
					requirements in accordance with AS3959-2009
Lot 4561	Open Forest to the North	Upslope / cross-slope	>48m - <100m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 4562	Open Forest to the North	Upslope / cross-slope	>48m - <100m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 4563	Open Forest to the North	Upslope / cross-slope	>48m - <100m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 4564	Open Forest to the North	Upslope / cross-slope	>48m - <100m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 4565	Open Forest to the North	Upslope / cross-slope	>48m - <100m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 4566	Open Forest to the North	Upslope / cross-slope	>48m - <100m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 4567	Open Forest to the North	Upslope / cross-slope	>48m - <100m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 4568	Open Forest to the North	Upslope / cross-slope	35 - 48m	BAL-19	Sect 3 & 6 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
			>48m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 4569	Open Forest to the North	Upslope / cross-slope	35 - 48m	BAL-19	Sect 3 & 6 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
			>48m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP



Lot Number	Vegetation Type & Direction from future dwellings	Average Slope of Land (degrees)	Separation Distance from Identified Vegetation	Bushfire Attack Level (BAL)	Construction Section
					Addendum Appendix 3
Lot 4570	Open Forest to the North	Upslope / cross-slope	35 - 48m	BAL-19	Sect 3 & 6 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
			>48m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 4571	Open Forest to the North	Upslope / cross-slope	35 - 48m	BAL-19	Sect 3 & 6 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
			>48m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 4572	Open Forest to the North	Upslope / cross-slope	35 - 48m	BAL-19	Sect 3 & 6 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
			>48m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 4573	Open Forest to the North	Upslope / cross-slope	35 - 48m	BAL-19	Sect 3 & 6 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
			>48m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 4574	Open Forest to the North	Upslope / cross-slope	35 - 48m	BAL-19	Sect 3 & 6 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
			>48m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 4575	Open Forest to the North	Upslope / cross-slope	35 - 48m	BAL-19	Sect 3 & 6 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3



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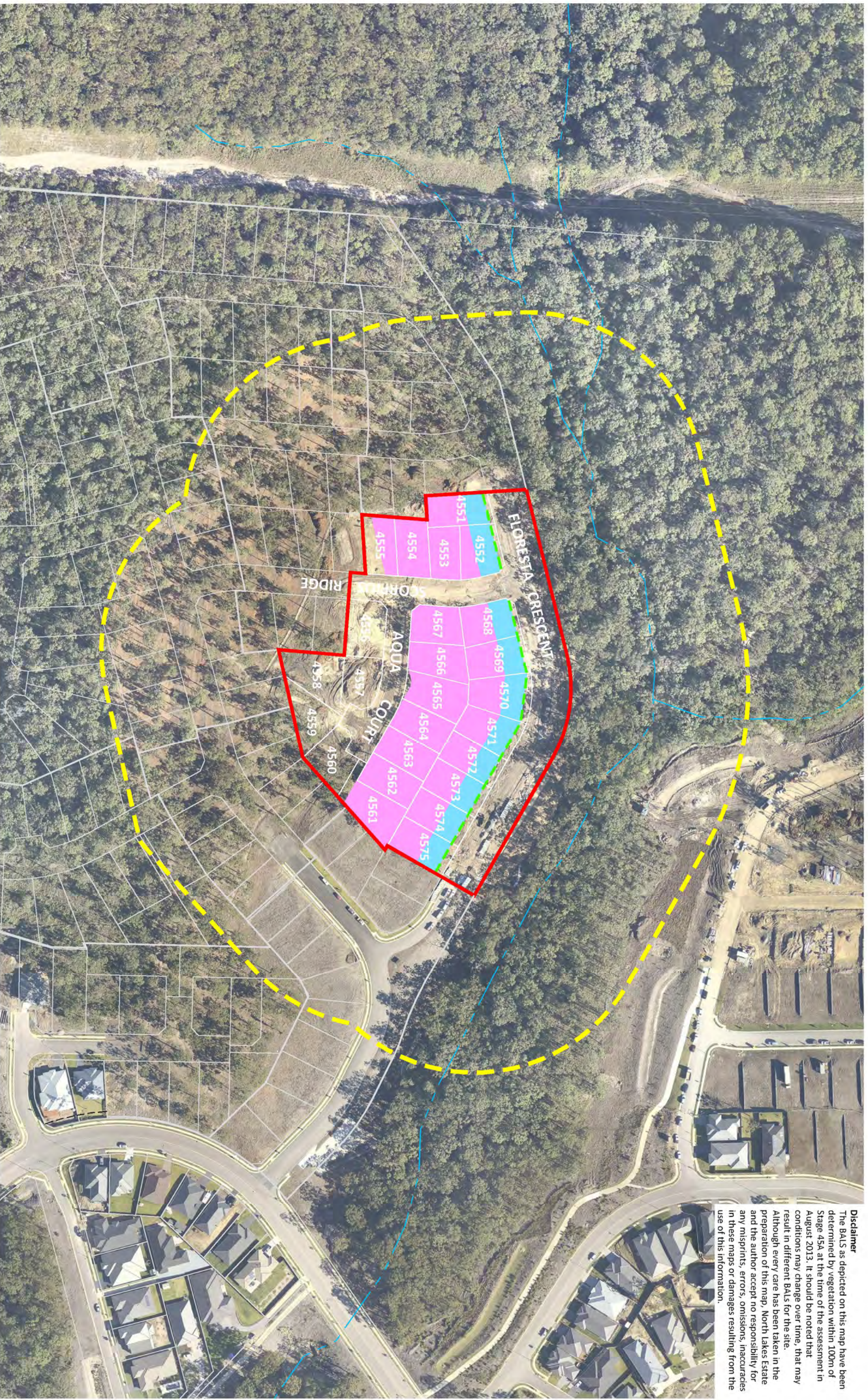
Lot Number	Vegetation Type & Direction from future dwellings	Average Slope of Land (degrees)	Separation Distance from Identified Vegetation	Bushfire Attack Level (BAL)	Construction Section
			>48m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3

**\*These BALs have been determined based on the management of the land to the East, South and West to a distance of 100m until this land is developed.**

**To Note:** The construction requirements for the next lower BAL than that determined for the site may be applied to an elevation of the building where the elevation is not exposed to the source of the bushfire attack. An elevation is deemed to be not exposed to the source of bushfire attack if all the straight lines between that elevation and the source of bushfire attack are obstructed by another part of the building. However, this does not apply to BAL-12.

No BALs applies to any future dwelling built greater than 100m from the Open Forest.

This report and mapping are not to be used to place wholesale restrictions on lots reflecting the resulting BAL mapping presented within. Building location and design will influence the application of the required BALs. For example, a lot indicated as being affected by BAL-40 may have those facades that are not exposed to the bushfire threat constructed to a lower BAL (i.e. BAL-29), reducing the costs of construction and providing more flexibility in choice of external building materials. Refer to Appendix B for Summary of AS3959-2009 Construction Standards and Appendix C for Additional Building Requirements.



**Disclaimer**  
 The BALS as depicted on this map have been determined by vegetation within 100m of Stage 45A at the time of the assessment in August 2013. It should be noted that conditions may change over time, that may result in different BALS for the site. Although every care has been taken in the preparation of this map, North Lakes Estate and the author accept no responsibility for any misprints, errors, omissions, inaccuracies in these maps or damages resulting from the use of this information.

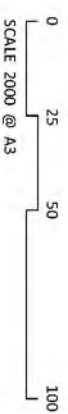
FIGURE 1-1: LOCALITY MAP

CLIENT  
 SITE DETAILS  
 DATE

North Lakes Pty Ltd  
 Stage 45A Northlakes Estate  
 15 September 2014

Legend

- Subject Site
- 100m Buffer
- 35m APZ
- BAL 19
- BAL 12.5
- Drainage



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## 5 CONCLUSION

This report provides an assessment of the Bushfire Attack Level (BAL) in accordance with AS3959-2009 Construction of Buildings in Bushfire Prone Areas for Stage 45A within the Northlakes Estate.

This report and mapping are not to be used to place wholesale restrictions on lots reflecting the resulting BAL mapping presented within. Future development of surrounding land to the west will result in lower BALs than detailed in this report.

This BAL report has shown that any future dwellings within the site will be able to meet the requirements of both AS3959-2009 and the addendum to Appendix 3 of Planning PBP 2006 (NSW Rural Fire Service NSW) and will meet complying development under the Code SEPP provided the other development standards as detailed within the Code SEPP are met.



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## 6 BIBLIOGRAPHY

NSW Rural Fire Service (RFS) 2006. Planning for Bushfire Protection: A guide for Councils, Planners, Fire Authorities, Developers and Home Owners. Australian Government Publishing Service, Canberra.

Standards Australia. 2009. Construction of buildings in bushfire-prone Areas, AS3959, Third Edition 2009, Incorporating Amendment 1, Standards Australia International Ltd Sydney





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# APPENDIX A      SALE PLAN



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# **APPENDIX B      SUMMARY OF AS3959-2009 CONSTRUCTION REQUIREMENTS**



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## **APPENDIX C**

# **ADDENDUM TO APPENDIX 3 OF PBP 2006 – ADDITIONAL BUILDING REQUIREMENTS**