Bushfire Hazard Assessment

Appendix M

Appendix M — Bushfire Hazard Assessment

M

Bushfire Hazard Assessment

Battery Recycling Facility
129 Mitchell Avenue Kurri Kurri

Prepared for Pymore Recyclers International Pty Ltd | 28 October 2016

Bushfire Hazard Assessment

Battery Recycling Facility

129 Mitchell Avenue Kurri Kurri

Prepared for Pymore Recyclers International Pty Ltd | 28 October 2016

Ground Floor, Suite 01, 20 Chandos Street
St Leonards, NSW, 2065

T +61 2 9493 9500
F +61 2 9493 9599
E info@emmconsulting.com.au

www.emmconsulting.com.au

Bushfire Hazard Assessment

Final

Report J15156RP1 | Prepared for Pymore Recyclers International Pty Ltd | 28 October 2016

Prepared by	**Mark Roberts**	Approved by	**Brett McLennan**
Position	Senior Environmental Consultant	Position	Director
Signature		Signature	
Date	28 October 2016	Date	28 October 2016

Document Control

Version	Date	Prepared by	Reviewed by
v1	28 October 2016	Mark Roberts	Brett McLennan

T +61 (0)2 9493 9500 | F +61 (0)2 9493 9599

Ground Floor | Suite 01 | 20 Chandos Street | St Leonards | New South Wales | 2065 | Australia

www.emmconsulting.com.au

Table of contents

Figures

Abbreviations

APZ	Asset protection zone
BCA	Building code of Australia
BHA	Bushfire attack assessment
DA	Development application
DCP	Development control plan
EIS	Environmental impact statement
EMM	EMM Consulting Pty Limited
FDI	Fire danger index
IPA	Inner protection area
LEP	Local environmental plan
LGA	Local government area
OPA	Outer protection area
PBP	Planning for bushfire protection
SEARs	Secretary's Environmental Assessment Requirements

1 Introduction

This bushfire hazard assessment (BHA) has been prepared by EMM Consulting Pty Ltd (EMM) for Pymore Recyclers International Pty Ltd's proposed used lead-acid battery (ULAB) recycling facility (the project) at 129 Mitchell Avenue, Kurri Kurri (the site). A BHA is required as the land is bushfire prone according to Cessnock City Council's (CCCs) bushfire prone land mapping (CCC 2015).

This BHA has been prepared in accordance with the NSW Rural Fire Service's (RFSs) *Planning for Bush Fire Protection Guideline* (RFS 2006) (PBP). It considers the bushfire hazard associated with the project and describes mitigation measures, in accordance with Appendix 4 of the PBP (submission requirements for development applications (DAs) on bushfire prone land).

1.1 Project overview

The facility would recycle approximately 60,000 tonnes per annum (tpa) of ULABs. The ULAB recycling plant would have four main processes – crushing, screening and separation; desulphurisation; crystallisation; and lead recovery. The entire process converts a ULAB into materials which are recycled for use in new products. Lead and plastics recovered are used in the production of new batteries. Sodium sulphate crystals, a by-product of ULAB recycling, can be readily used in other industries.

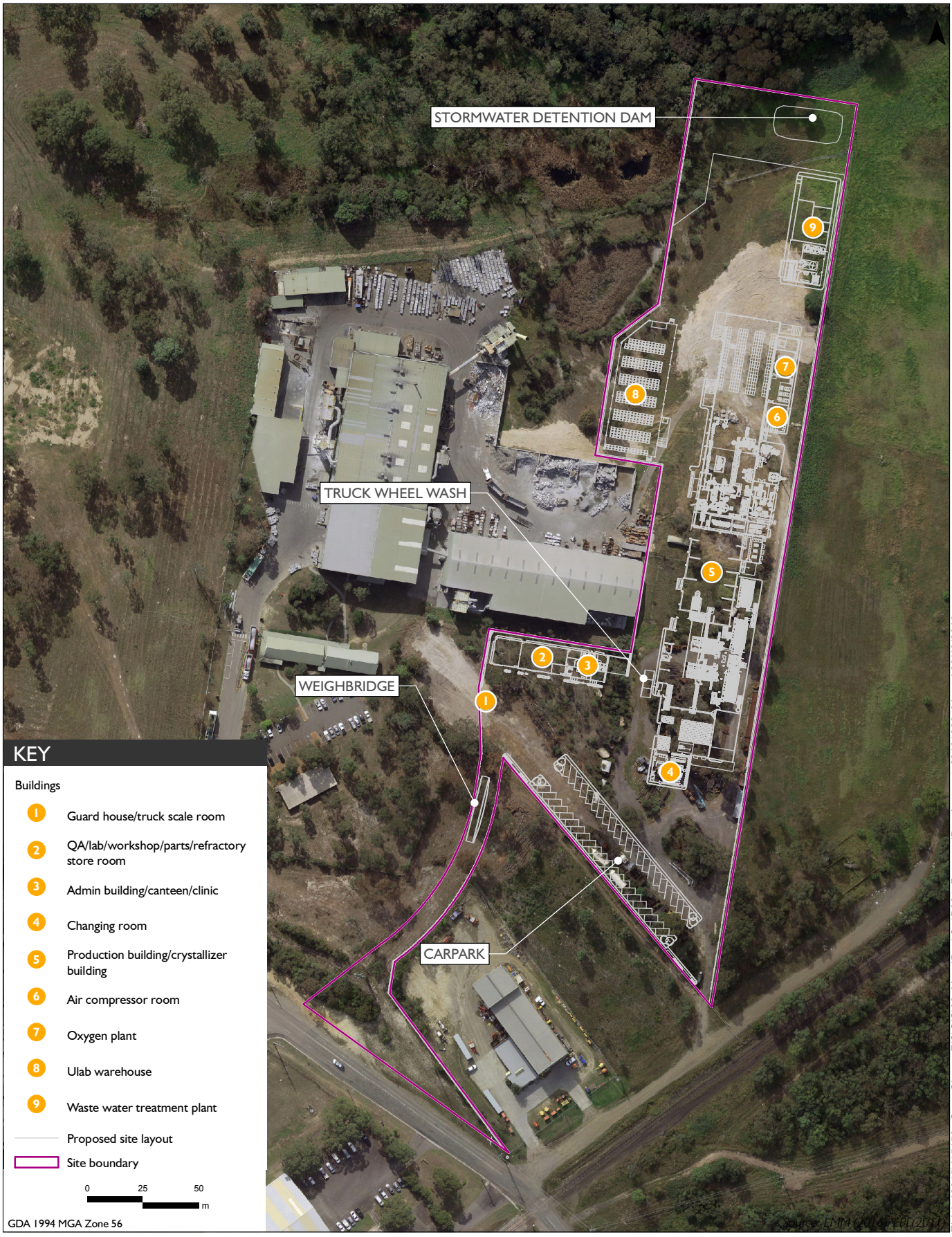
The project is State significant development (SSD) which requires development consent under Part 4, Division 4.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). A DA for SSD is required to be accompanied by an environmental impact statement (EIS). This BHA will be appended to the EIS for the project.

1.2 Development application and bushfire assessment statutory requirements

This BHA is appended to the EIS to enable the Minister for Planning to consider bushfire risks at the site.

Section 79BA of the EP&A Act requires developments on bushfire prone land to conform to the specifications in PBP.

Section 63(2) of the NSW *Rural Fires Act 1997* (RF Act) requires the owners of land to prevent the ignition and spread of bushfires on their land. The implementation of the recommended measures in this bushfire assessment will ensure that the risk of bushfire ignition and spread will be as low as practically possible.



T:\Jobs\2015\J15156 - SuperCharge EIS\GIS\02_Maps\BushfireIB004_ProposedDevelopment_20161028_01.mxd 28/10/2016

Indicative project layout

Kurri Kurri Battery Recycling Facility
Bushfire Hazard Assessment

Figure 1.1

1.3 Objective and scope

The project is categorised in section 1.1 of the PBP as 'other development', that is, development which is not an 'integrated development' such as residential/rural residential subdivision or special fire protection purposes. 'Other development' is required to satisfy the aim and objectives of the PBP.

The aim of the PBP is to:

> To use the NSW development assessment system to provide for the protection of human life (including fire-fighters) and to minimise impacts on property from the threat of bushfire, while having due regard to development potential, onsite amenity and protection of the environment (RFS, 2006).

The objectives of the PBP are as follows (RFS, 2006):

- afford occupants of any building adequate protection from exposure to a bushfire;
- provide for a defendable space to be located around buildings;
- provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;
- ensure that safe operational access and egress for emergency service personnel and residents is available;
- provide for ongoing management and maintenance of bushfire protection measures, including fuel loads in the APZ; and
- ensure that utility services are adequate to meet needs of firefighters (and other assisting in bushfire fighting).

2 Existing environment

This section determines if the project's buildings will be on bushfire prone land and describes vegetation and slope within 100 m of the buildings, as required by Appendix 4.1 of PBP.

2.1 Locality

The site is surrounded by the following land uses:

- South – Mitchell Road and industrial structures on lots with managed vegetation;
- East – cleared agricultural land;
- North – native vegetation along Swamp Creek; and
- West – industrial structures and managed vegetation associated with Weston Aluminium.

The proposal will be on the eastern section of Lot 796 DP 39877. The western section of the lot is currently occupied by Weston Aluminium and will be subdivided prior to construction.

2.2 Bushfire prone land

Bushfire prone vegetation is generally categorised into two categories. Category 1 (coloured orange) bushfire prone vegetation is the most hazardous vegetation category, and refers to forest, woodlands, heath and wetlands greater than 1 hectare (ha) in size. Category 2 (coloured yellow) bushfire prone vegetation refers to moist forests, shrublands, open woodlands, mallee, grasslands, and pockets of Category 1 vegetation less than 1 ha in size. Category 2 vegetation is at less risk from bush fire than Category 1 vegetation.

Land that directly adjoins bushland is also classified as Vegetation Buffer (coloured red). These are the areas in which developments and people are most likely to be affected by a bushfire burning in the adjacent land. The buffer area extends for a distance of 100 metres (m) from Category 1 areas and for a distance of 30 m from the Category 2 areas.

It should be noted that the RFS has introduced new three category bushfire prone vegetation mapping system. However, this is subject to a three year transition period and most local government areas (LGAs), including Cessnock, still have the two category system.

There is Category 1 bushfire prone vegetation in and adjacent to the south-west and south-east of the site (Figure 2.1), with the corresponding 100 m vegetation buffer extending into the site in those areas. There is a mix of Category 1 and Category 2 bushfire prone vegetation to the south of the site, with the corresponding 100 m and 30 m vegetation buffers extending into the site in those areas.

2.3 Vegetation

Dr David Keith compiled broad scale native vegetation classifications and maps between 2001 and 2004 for NSW (the Keith formations) (Keith 2004). The PBP uses the Keith formations to classify bushfire hazard vegetation (the PBP classifications).

The vegetation was surveyed on 18 February 2016 by an EMM ecologist, who identified the following communities:

- west, south and south-west of the site boundaries – Parramatta Red Gum – Narrow-leaved Apple – Prickly-leaved Paperbark Shrubby woodland in the Cessnock-Kurri Kurri area; and
- north and north-west of the site – Cabbage Gum – Rough-barked Apple grassy woodland on alluvial floodplains of the lower Hunter.

Additionally, the vegetation was classified on 2 March 2016 in accordance with the key in Keith (2004) by an EMM bushfire specialist, who identified the following vegetation classes:

- north and north-west of the site – forest; and
- west, south and south-west of the site boundaries – forested wetland.

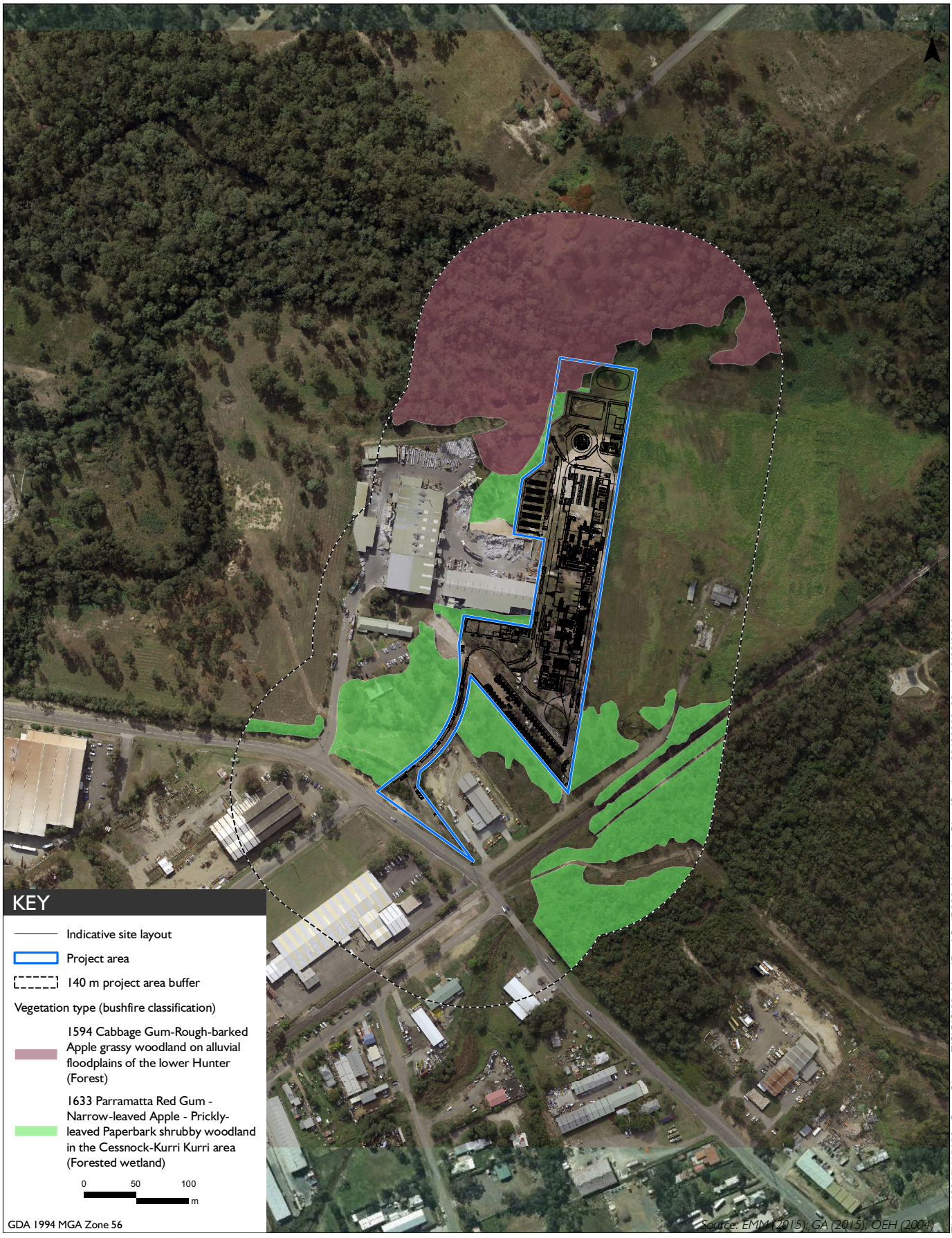
The PBP classification, distance and direction of native vegetation within 100 m of project buildings on bushfire prone land are shown on Figure 2.1.

2.4 Slope

Slope is an important contributor to a bushfire's rate of spread. A bushfire will spread quicker up a steep slope compared to a gradual slope or flat land. Slopes are classified according to the PBP, and are combined with vegetation classes in an area to determine appropriate asset protection zones_(APZs) (see Section 3.1). The slope over a distance of 100 m from the site boundary was determined using a digital terrain model (2 m height resolution). The slopes were classified according to the PBP:

- slope class i - all upslope vegetation (considered 0°);
- slope class ii - >0 to 5° downslope vegetation;
- slope class iii - >5 to 10° downslope vegetation;
- slope class iv - >10 to 15° downslope vegetation; and
- slope class v - >15 to 18° downslope vegetation.

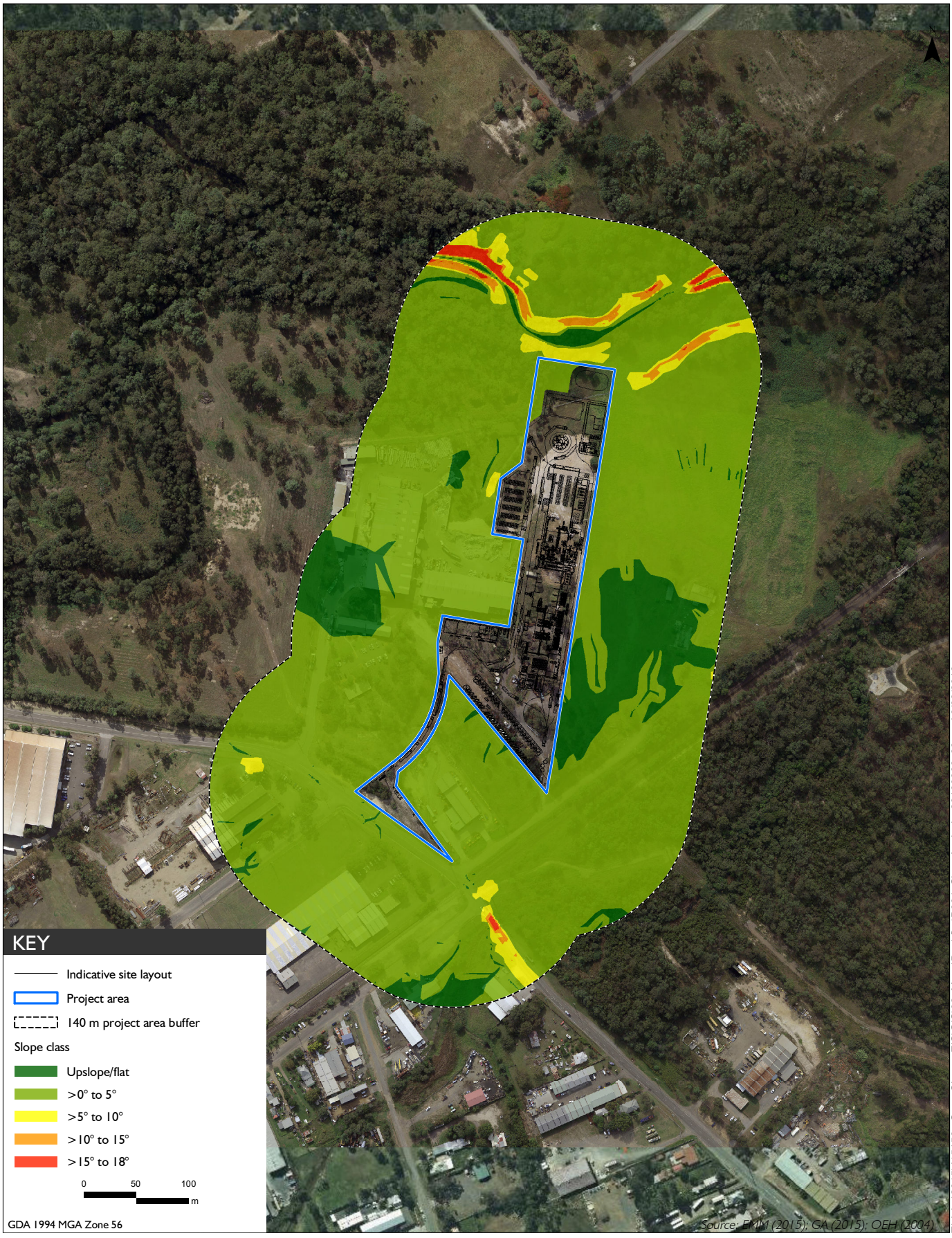
Project buildings on bushfire prone land will be constructed on flat areas. The majority of the site is surrounded by slope class ii and there are small areas of slope class iii along the shallow vegetated banks of Swamp Creek (Figure 2.2).



EMM

Vegetation classification

Kurri Kurri Battery Recycling Facility
Bushfire Hazard Assessment
Figure 2.1



EMM

Slope class

Kurri Kurri Battery Recycling Facility
Bushfire Hazard Assessment
Figure 2.2

3 Bushfire prevention and protection

This section identifies APZs, including appropriate widths, maintenance requirements and specifications for service and access provision as provided in Chapter 4 of the PBP.

3.1 Asset protection zones

An APZ is also known as a fire protection zone and aims to protect human life, property and highly valued assets. It is a buffer zone between a bush fire hazard and buildings. The PBP does not provide APZ specifications for 'other development', including industrial buildings. However, such development is required to comply with the objectives of the PBP, including provision of buffers between buildings and bushfire prone vegetation. Appendix 2 of the PBP (see Section 1.2) provides a procedure for determining APZs for habitable buildings, which has been adopted in this bushfire assessment.

An APZ is the distance that buildings are set back from vegetation that represents a bushfire hazard (see Appendix 2 of the PBP). APZs are provided for the following reasons:

- to provide sufficient separation from buildings for safe fire fighting;
- to reduce radiant heat at buildings;
- to reduce the influence of convection driven winds;
- to reduce the threat of ember attack on buildings; and
- to allow for dispersal of smoke.

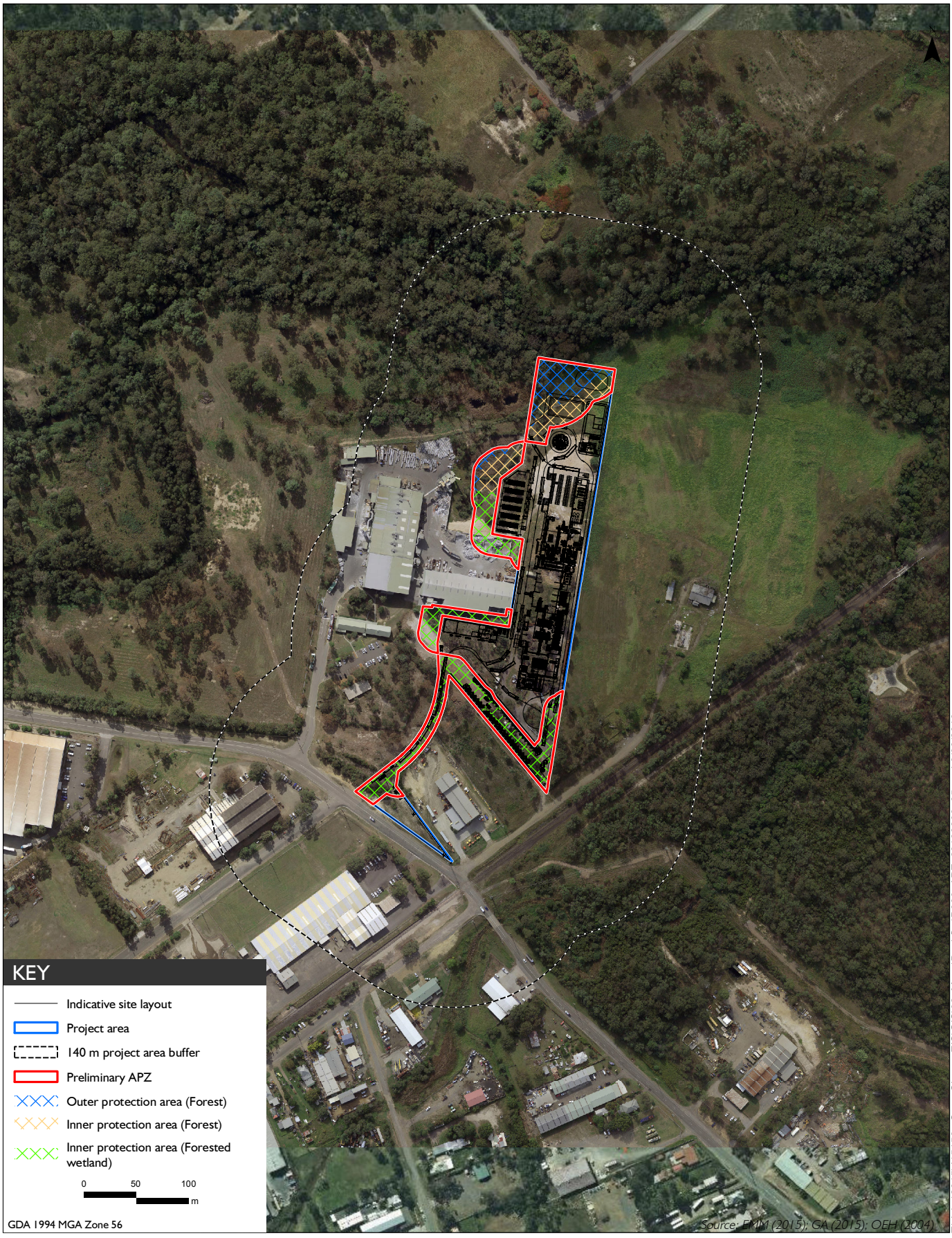
APZs are divided into an 'inner protection area' (IPA) and an 'outer protection area' (OPA) where there is adjacent forest vegetation. The IPA provides a defendable space and reduces heat intensities near buildings. The OPA helps reduce the length of flames, the speed of fire advance and the likelihood of fire spread by 'crowning'.

APZs are determined by referring to tables A2.5 and A2.7 (for forest vegetation) in PBP, which compare predominant fire hazard vegetation formations, highest slope classes near subject buildings and fire weather at a site. The fire weather or 'fire danger index' (FDI) for Cessnock LGA is 100 (Table A2.3 in the PBP).

The resulting APZs for the project are (Figure 3.1):

- Forested wetlands: slope class ii: 20 m.
- Forest:
  - slope class ii: IPA – 15 m, OPA – 10 m; and
  - slope class iii: IPA – 20 m, OPA – 15 m.

A small portion of building 9 falls within the APZ to the north of the project area. This part of the building is not habitable and will contain water tanks and other water storage structures.



EMM

Preliminary asset protection zones

Kurri Kurri Battery Recycling Facility
Bushfire Hazard Assessment
Figure 3.1

3.1.1 APZs on adjacent land under separate ownership

The site is narrow due to the presence of existing structures on the western section of the lot associated without Weston Aluminium. Therefore, project buildings will be constructed close to the project area boundaries. Due to this, it will be necessary to implement some of the APZs on Weston Aluminium's land. Remnant vegetation on this land is actively managed with reduced over and under storeys. Accommodation of APZs within the site would significantly constrain the project.

Pymore is currently in negotiations with Weston Aluminium to purchase the section of lot where the project will be constructed. Further, Weston Aluminium has agreed to maintain vegetation subject to APZs on its land in accordance with the guidelines in Section 3.1.2 below. A formal agreement between Pymore and Weston Aluminium on the maintenance of the APZs will be entered into prior to construction of the project.

3.1.2 Maintenance of APZs

The APZs will be maintained in a manner that prevents accumulation of fine flammable debris on the ground so that fuel quantities are reduced, thus lessening flame heights and potential for crowning. General maintenance guidelines are described in Appendix 2 of PBP.

The IPAs will be maintained in the following manner:

- canopy cover will be kept at less than 15% of total surface area and located more than 2 m from the roof line of a building;
- garden beds and shrubs will not be located under trees and no closer than 10 m from any exposed windows or doors; and
- lower limbs of trees will be removed up to 2 m above the ground.

The OPAs will be maintained in the following manner:

- canopy cover will be kept at less than 30% of total surface area; and
- understorey will be mowed annually before the fire season (usually September) so that there are no shrubs or long grasses.

3.2 Services

Water, gas and electricity services will be located and installed in a manner that reduces the potential for them to contribute to fire hazard. Detailed design has not taken place for the project. However, the specifications given below will be incorporated into the detailed project design.

3.2.1 Water

The availability of water is a critical determinant of the survival of life and property during a bushfire. Water for fire fighting will be provided to the project as follows:

- existing fire hydrants in Mitchell Avenue;
- extinguishers and fire hydrants at buildings;

- 205 m^3 fire water tank on site with booster pump; and
- 600 m^3 dam on site.

The following requirements from Chapter 4 of PBP will be applied to water infrastructure:

- the tank will be manufactured of concrete or metal and will have its stands protected if it is raised;
- the hazard side of the tank will be protected if it is in the APZ;
- above ground pipes external to structures in the APZ will be metal including and up to taps;
- pumps in the APZs will be shielded; and
- Fire hydrants at buildings which will be spaced, sized and pressured in accordance with *Australian Standard 2419.1-2005 Fire Hydrant Installations – System Design, Installation and Commissioning*.

3.2.2 Electricity and gas

Electricity and gas services will be located so they do not contribute to the risk of fire to a building. The following guidelines will be followed during detailed project design (from Chapter 4 of PBP):

- it is preferable to place electrical transmission lines underground. However, If overhead electrical transmission lines are to be used, they will be installed and managed in accordance with Ausgrid (2010) *NS179 Vegetation Safety Clearances*;
- *AS/NZS 1596:2008 The Storage and Handling of LP Gas* will be followed for bottled gas installation and maintenance. Metal piping will be used;
- there will be minimum 10 m distance between fixed gas cylinders and flammable materials and shielding will be placed on the hazard side of the cylinders; and
- release valves on gas cylinders close to buildings will be directed away from the building and minimum 2 m from combustible material. Metal connections will be used.

3.3 Access

The project will be accessed and exited via a sealed driveway off Mitchell Avenue, which will be constructed to accommodate vehicles over 15 tonnes (t) such as fire fighting vehicles. It will have a minimum vertical clearance of 4 m to any overhead obstructions including branches.

3.4 Mitigating features

Appendix 4.1 requires a BHA to describe features that may mitigate the impact of a high intensity bushfire on a proposed development. Land to the east, south and west of the site is used for agricultural and industrial purposes and contains vegetation which is managed on an ongoing basis. The managed vegetation will reduce the intensity of fires if any are ignited in the vegetation as thinning is undertaken in the vegetation to the west and north and the agricultural land to the east is cleared.

3.5 Environmental impacts of mitigation measures

Appendix 4.1 requires a BHA to describe environmental impacts from the implementation of bushfire protection measures. Provision of the above measures will not have an environmental impact as built elements will be on existing cleared areas and the APZs will be in existing managed vegetation.

4 Bushfire construction levels

Section A4.1 of the PBP requires an assessment of whether specific buildings are capable of complying with the bushfire construction levels described in *Australian Standard 3959 – 2009 Construction of Buildings in Bushfire Prone Areas* (AS 3959 – 2009). The specific buildings are classified by the *Building Code of Australia* (BCA 2013) as class 1, 2, 3 and 4 buildings; and some class 9 and 10 buildings.

The project's buildings do not correlate to the above BCA classes and therefore does not have bushfire construction levels specified in AS 3959 – 2009. Notwithstanding, the PBP requires that such buildings comply with the general bushfire construction requirements in section 3 of AS 3959 – 2009. Project buildings will be constructed to comply with these requirements.

5 Conclusion

The project will be on bushfire prone land and this assessment describes measures to enable the project to comply with the objectives of the PBP. Specifically, APZs will be provided and managed to enable fire fighter access, passage for evacuees and to reduce radiant heat at project buildings. The risk of the project initiating a bushfire will be minimised through the implementation of management measures.

References

Ausgrid 2010 *NS179 Vegetation Safety Clearances*.

Australian Building Codes Board 2013 *Building Code of Australia* (BCA). Australian Government.

Australian Standard/New Zealand Standard 1596:2008 The Storage and Handling of LP Gas (AS/NZS 1596:2008).

Australian Standard 2419.1-2005 Fire Hydrant Installations – System Design, Installation and Commissioning (AS 2419.1-2005).

Australian Standard 3959 – 2009 Construction of Buildings in Bushfire Prone Areas (AS 3959 – 2009).

Cessnock City Council 2015 *Cessnock City Council Bushfire Prone Land*.

Keith D 2004 *Ocean Shores to Desert Dunes: The Native Vegetation of New South Wales and the ACT*. NSW Department of Environment and Conservation.

NSW Rural Fire Service (RFS) 2006 *Planning for Bushfire Protection*. NSW Government.

SYDNEY
Ground floor, Suite 01, 20 Chandos Street
St Leonards, New South Wales, 2065
T 02 9493 9500 F 02 9493 9599

NEWCASTLE
Level 5, 21 Bolton Street
Newcastle, New South Wales, 2300
T 02 4927 0506 F 02 4926 1312

BRISBANE
Level 4, Suite 01, 87 Wickham Terrace
Spring Hill, Queensland, 4000
T 07 3839 1800 F 07 3839 1866