



APPENDIX O

BUSHFIRE ASSESSMENT



Bushfire Assessment

**CSR Advanced
Manufacturing Hub
(Modifications 3 and 4)**

**235 Martin Road, Badgerys
Creek**

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(Ref: 18052)

report by
david peterson

0455 024 480
david@petersonbushfire.com.au
po box 391 terrigal nsw 2260
petersonbushfire.com.au

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1 Introduction

Street address:	235 Martin Road, Badgerys Creek	
Suburb:	Badgerys Creek	Postcode: 2555
Lot/DP no:	Lots 1 & 2 DP 1035249, Lot 1 DP 373863 and Lots 54-59 DP 3050	
Council:	Liverpool City Council	

1.1 Background

On behalf of their client CSR, Element Environment commissioned Peterson Bushfire to prepare a bushfire assessment for the proposed expansion of the existing brick making facility at the above address. The subject lots are identified as 'bushfire prone', however the proposed buildings will not be within the mapped bushfire prone area. Notwithstanding, a bushfire assessment has been requested to address any potential bushfire hazards that may be adjacent the area of proposed development.

Continued quarrying and brick making on the site has already been approved (Project Approval PA10_0014) however CSR wish to modify the approval to meet the changing needs of their brick and roof products manufacturing businesses. Two modifications (Modifications 3 and 4) to the Project Approval have been applied for under Section 75W of the *Environmental Planning and Assessment Act 1979* relating to increased quarrying, production, storage and transportation operations.

This report presents the assessment and recommendations to ensure compliance with the relevant bushfire protection legislation for development proposals on bushfire prone land.

This bushfire assessment has been prepared by a consultant accredited by the Fire Protection Association of Australia's BPAD scheme (Accreditation No. BPD-L3-18882).

1.2 Location and land description

The location of the CSR Manufacturing Hub is shown in Figure 1. The subject site is located at the end of Martin Road, Badgerys Creek. At approximately 200 hectares in size, the site spans between South Creek in the east to Badgerys Creek in the west. Both creek lines and associated flood prone land support bushfire prone vegetation, being the only vegetation in the locale. The northern and southern boundaries are bordered by cleared and managed lands.

The site is largely cleared featuring the existing PGH brick making facility and associated material stockpiles and dams surrounded by paddocks. Few scattered trees are on the site with the only extensive vegetation being that associated with the riparian areas along both the eastern and western boundaries.

1.3 Development proposal

A description of Modifications 3 and 4 is listed below. Figure 2 is a site plan showing the location of each proposed building element.

Modification 3

- Advanced Manufacturing - Brick Production
 - Removal of most of the existing brick manufacturing equipment and replacement with new brick manufacturing equipment in the existing brick making facility;
 - Increase in the building footprint of the existing brick making facility;
 - Increase in the building footprint of the existing administration building;
 - A NATA (National Association of Testing Authorities) Accredited Advanced Testing Laboratory;
 - Extension to the existing visitor's carpark;
 - An innovation centre;
 - A weighbridge;
 - Factory staff parking;
 - A new access road to the factory staff parking area and for bulk material deliveries and dispatch;
 - New rainwater tanks; and
 - A battery store.
- Advanced Manufacturing – Roof Products Production
 - Construction and operation of a roof products manufacturing facility on CSR owned land, outside the approved project boundary, immediately east of Pit 4;
 - Modification to the approved project boundary to include the proposed roof products manufacturing facility, located on the adjacent property; and
 - The processing of sandstone (overburden material not used in brick production) for use in the manufacture of roof products on-site.
- General
 - Re-commence operations at the site as approved in the Project Approval (PA10_0014), and expel the current mothballed status of the site;
 - Amendment to the extent of Pit 5 to include a 200m buffer zone to neighbouring residential properties required under the *Mining Act 1992*;

- An increase in the importation of raw materials from off-site for use in both the brick making and roof products manufacturing facilities; and
- Modifications to the approved noise bunds.

Modification 4

- Solar farm;
- The dewatering of Pit 1;
- Continued extraction of clay material in Pit 1 to a depth of 35 m; and
- The importation of Virgin Excavated Natural Material (VENM) to backfill Pit 1 and potentially other pits, to rehabilitate the site and facilitate future development.

1.4 Assessment requirements

The Secretary's Environmental Assessment Requirements (SEARs) for Modifications 3 and 4 do not list bushfire as an issue for assessment. This technical report has been commissioned by the client due to the bushfire prone land mapping affectation.

Development proposals on bushfire prone land are required to be assessed against the NSW Rural Fire Service (RFS) document *Planning for Bushfire Protection 2006* (NSWRFS 2006), referred to as 'PBP' within this report. As the proposal does not involve habitable dwellings (Class 1, 2 or 3) or Special Fire Protection Purpose (SFPP) development, the proposal is only required to comply with the aim and objectives of PBP.

As stated within Section 4.3.6.f of PBP, the National Construction Code (NCC) does not provide for any bushfire specific performance requirements for the development type proposed. As such the Asset Protection Zone and building construction requirements of PBP and AS 3959-2009 *Construction of buildings in bushfire-prone areas* (AS 3959) do not apply as deemed-to-satisfy provisions for bushfire protection. However, the aim and objectives of PBP still apply in relation to other matters such as access and the provision of water for fire-fighting.

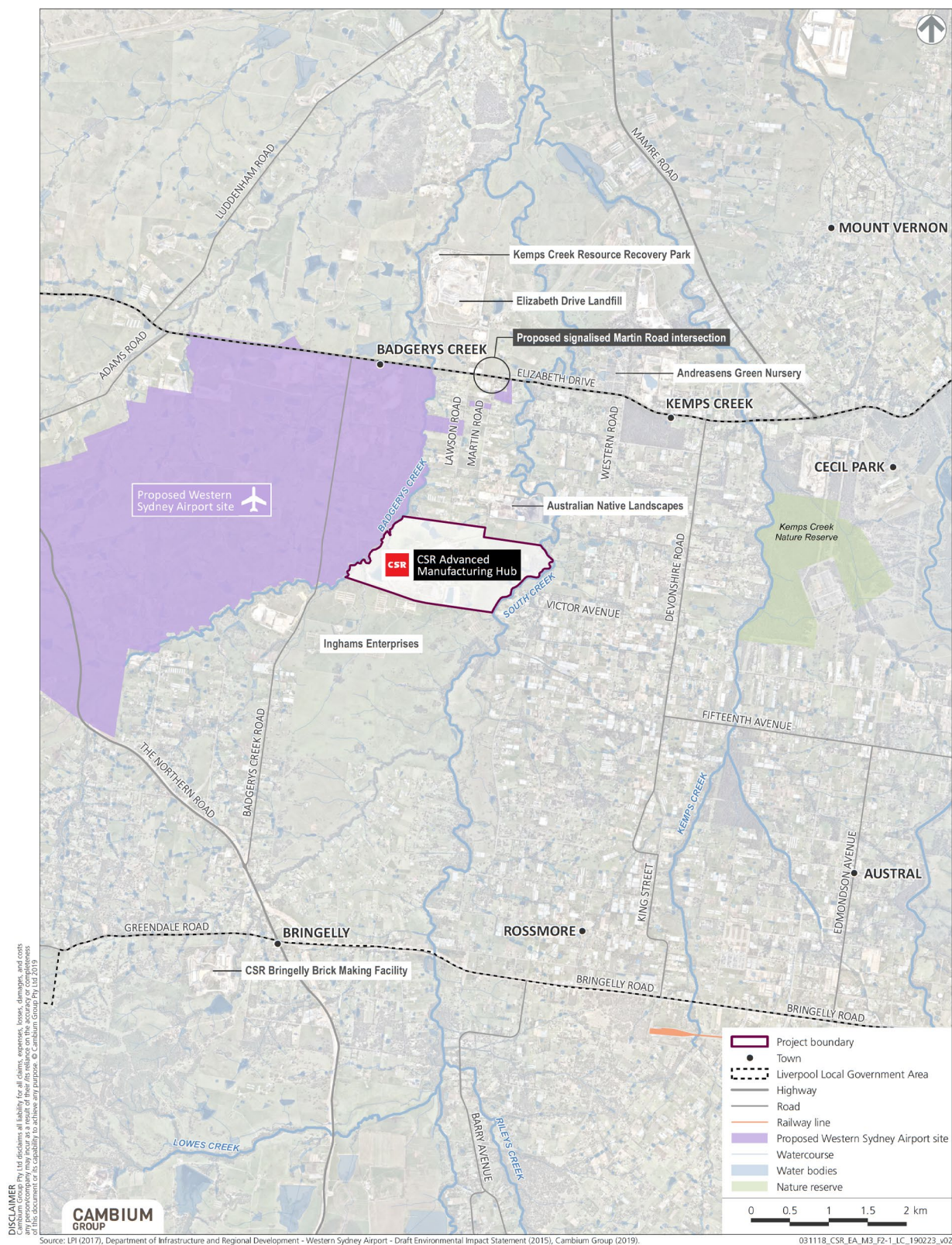


Figure 1: Location of site



2 Bushfire hazard

In accordance with PBP, the bushfire hazard has been evaluated through an analysis of a combination of slope and vegetation, as discussed in this section.

2.2 Predominant vegetation

Bushfire fuel is the vegetative material in the landscape that burns during a bushfire. Bushfire behaviour is influenced by fuel load, and the availability of the fuel which is mostly determined by the arrangement of the fuel and its moisture content. Fuel load and availability affects the intensity of a bushfire.

In accordance with PBP the predominant vegetation class has been determined for a distance of at least 140 m out from the proposed development. Only the proposed Monier roof products manufacturing facility (Modification 3) and solar farm (Modification 4) will have bushland within 140 m, being a 2 hectare remnant of Alluvial Woodland situated alongside a flood channel of South Creek to the south-east. The Monier warehouse will be greater than 100 m from the woodland.

Generally speaking, the paddocks that will surround the proposal have the potential to pose a grassland hazard depending on the management regime and rates of growth and curing. CSR intend to continue the grazing lease within the paddocks eastwards down to South Creek which will reduce the chance of fire spread through the paddocks towards the facility.

2.3 Effective slope

Steeper slopes can significantly increase the rate of spread of fires, and it has been shown that with each 10 degree increase or decrease in slope a corresponding doubling or halving, respectively, in the rate of spread can be expected (McArthur 1967). Slope is a major factor determining the direction and rate of fire spread.

In accordance with PBP the effective slope underneath the woodland remnant to the south-east, the surrounding paddocks and the riparian vegetation along the eastern and western boundaries is within the PBP slope class of 'downslope 0-5 degrees'. The gentle gradient underneath the remnant woodland and surrounding paddocks equates to a lesser rate of fire spread influenced by topography. Variables such as fuel distribution and wind direction and speed would therefore be the primary factors influencing rate of spread at this site.

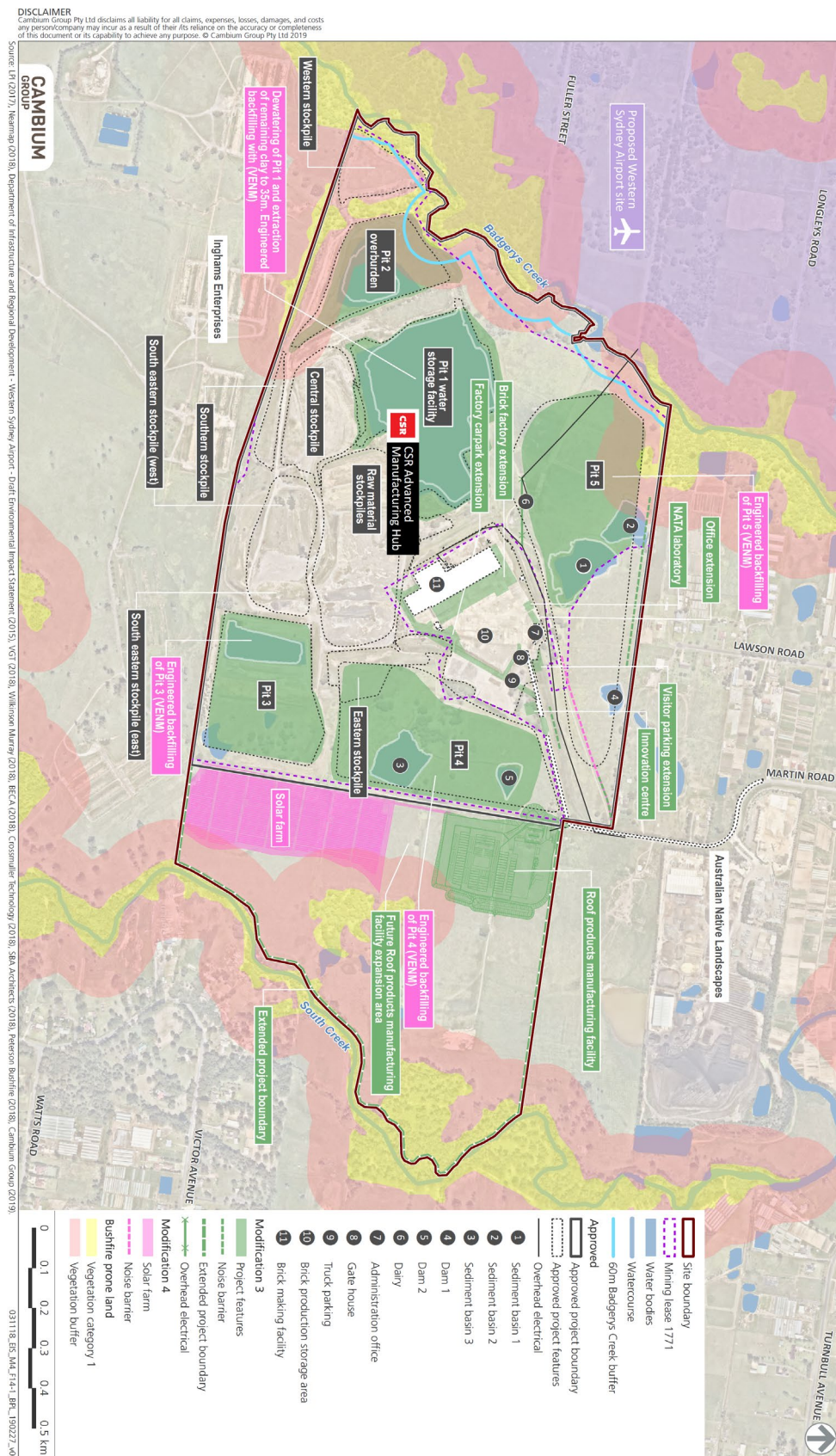


Figure 3: Bushfire prone land mapping

3 Bushfire protection measures

PBP requires the assessment of a suite of bushfire protection measures that in total provide an adequate level of protection for development proposals on bushfire prone land. The measures required to be assessed are addressed below.

3.1 Defendable space

For habitable development types such as dwellings, an asset protection zone (APZ) dimension is related to the vulnerability of an asset typically in terms of combustibility of external materials or the nature of the occupants. The resulting APZ would stipulate a construction standard under *AS 3959-2009 Construction of buildings in bushfire-prone areas* (AS 3959).

As the proposal does not include a dwelling or habitable building, PBP does not list an APZ requirement. However, PBP does require the consideration of a managed hazard-separation area for fire-fighting purposes referred to as 'defendable space'. A defendable space is defined by PBP as *"an area within the asset protection zone that provides an environment in which a person can undertake property protection after the passage of a bushfire with some level of safety"*. Therefore, the defendable space dimension is defined by the ability to gain access around an asset and conduct defensive fire-fighting operations. Relying on a defendable space in lieu of an APZ is deemed acceptable whereby construction materials are typically non-combustible and meet building and structural fire requirements.

All buildings proposed in Modifications 3 and 4 will have a defendable space between them and the adjacent grassland and woodland areas. The defendable space is simply a thoroughfare around buildings so fire-fighters can gain access to conduct property defence between an approaching grassfire and a building. The existing and proposed layout allows sufficient access around the buildings that has been designed for the maneuverability of large vehicles used in day-to-day operations of the facilities.

The defendable space will be cleared of vegetation and therefore satisfies the fuel management performance requirements of an Asset Protection Zone (APZ) as described by PBP. Additional vegetation management is not required.

3.2 Building construction

As introduced in Section 1.3, building construction provisions within AS 3959 do not apply to developments of the type proposed as a deemed-to-satisfy requirement under the NCC. Due to the type of development and compliance with NCC requirements for building and structural fire, it is generally accepted that buildings will survive bushfire attack. In addition, staff will not reside at the site and will be familiar with the access routes should an evacuation be necessary.

For comparative assessment purposes, a Bushfire Attack Level (BAL) assessment has been undertaken to provide an understanding of the level and type of bushfire attack future development could experience in a worst-case scenario should the surrounding paddocks experience a grassfire. The BAL assessment provides a platform on which to develop any

further recommendations specific to the bushfire threat, modes of bushfire attack (such as embers or wind which are not addressed by NCC for structural fire protection) or proposed buildings, if deemed appropriate.

Assuming the surrounding paddocks could act as a grassland hazard (e.g. if management practices such as grazing were to cease) the resulting BAL for buildings located within 50 m of grassland is BAL-12.5. BAL-12.5 is the lowest level for buildings within 100 m of a hazard, and is predominantly concerned with protection from ember attack. Given the construction type of the buildings and the low threat presented by the surrounding lands, it is determined that there is insufficient risk to warrant the application of specific bushfire construction requirements in this case.

3.3 Access

The assessment of access is to consider the adequacy of public road access, property access roads and defendable space.

The site is accessed by Martin Road to the north which complies with the public road design and construction standards specified by PBP. Although it is the only vehicular access into and out of the site, Martin Road is deemed adequate in providing the required level of access for fire-response and egress for evacuation as it leads away from the bushfire hazard and threat (eastern and western boundaries) and is flanked by cleared and managed lands. It is highly unlikely that Martin Road will be severed by the impacts of fire.

The existing and proposed property access roads are such that adequate access will be provided for emergency vehicles and will be suitable for defendable space requirements. The layout complies with PBP property access road requirements. Additional access provisions are not required to support the proposed development.

3.4 Water supply and utilities

Water supply

The development will require fire hydrants to be installed to comply with *AS 2419.1 – 2005 Fire Hydrant Installations - System Design, Installation and Commissioning* (AS 2419) so that all sides of a building envelope are within 70 m of a hydrant by lay of the hose (or 90 m with a tanker parked in-line maximum 20 m from the hydrant).

Electrical supply

Where overhead electrical transmission lines are installed, the vegetation clearance distances are to comply with *ISSC 3 Guideline for Managing Vegetation Near Power Lines* (Industry Safety Steering Committee 2005).

Gas supply

Any gas services are to be installed and maintained in accordance with *AS/NZS 1596-2008 The storage and handling of LP gas*.

4 Conclusion and recommendations

4.1 Conclusion

The proposal consists of Modifications 3 and 4 of the approved expansion (Project Approval PA10_0014) of the Badgerys Creek Brick Making Facility (CSR Advanced Manufacturing Hub). The bushfire hazard consists of remnant woodland at least 100 m from the closest building. The remainder of the surrounding lands consist of the existing portion of the facility and cleared paddocks.

Planning for Bushfire Protection 2006 does not require specific asset protection zone measures or construction standards under *AS 3959-2009 Construction of buildings in bushfire prone-areas* for the development type proposed. Nonetheless, the development will have adequate separation and defendable space between it and any potential grassland hazard that may eventuate within the surrounding paddocks.

The existing and proposed access ways provide adequate defendable space to allow fire-fighting operations to occur, whilst also providing a platform for rapid operational response and, in the unlikely event, evacuation.

4.2 Recommendations

The recommendations made within this assessment are repeated below:

1. The development will require fire hydrants to be installed to comply with AS 2419.1 – *2005 Fire Hydrant Installations - System Design, Installation and Commissioning* (AS 2419) so that all sides of a building envelope are within 70 m of a hydrant by lay of the hose (or 90 m with a tanker parked in-line maximum 20 m from the hydrant).
2. Where overhead electrical transmission lines are installed, the vegetation clearance distances are to comply with *ISSC 3 Guideline for Managing Vegetation Near Power Lines* (Industry Safety Steering Committee 2005).
3. Any gas services are to be installed and maintained in accordance with *AS/NZS 1596-2008 The storage and handling of LP gas*.

4.3 Compliance with *Planning for Bushfire Protection 2006*

This assessment demonstrates that the proposal, together with the recommendations, complies with *Planning for Bushfire Protection 2006* (refer to Section 3 – Bushfire Protection Measures).



David Peterson



References

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