Bushfire

Services

Bushfire Protection Assessment

Proposed Diesel Storage Facility &
Refuelling Station
West Cliff Colliery
Appin
Wollondilly Shire Council

May 2008

Our Reference: B2080041

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Prepared 9 May 2008

for

BHP Billiton Illawarra Coal

PROJECT TEAM:

David Peterson

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PART A Introduction, property description and proposal

Name:	BHP Billiton Illawarra Coal Pty Ltd		
Postal Address:	C/- Cardno Forbes Rigby, 278 Keira Street, Wollongong NSW 2500		
Street or Property Name:	West Cliff Colliery		
Suburb, Town or Locality:	Appin	**Postcode:**	2560
Local Government Area:	Wollondilly Shire Council		
Type of Area:	**Urban** ☐ **Rural Residential** ☐ **Isolated Rural** ☐ **Other** ☒ **Industrial**		
Type of Development:	**Subdivision** ☐ **Dwelling** ☐ **Other** ☒ **Industrial**		

A.1. Introduction, development proposal and location

BHP Billiton Illawarra Coal Pty Ltd commissioned Bushfire and Environmental Services Pty Ltd (BES) to prepare a bushfire protection assessment (BPA) for the installation of a replacement diesel storage facility and refuelling station at West Cliff Colliery. The Colliery is located off Wedderburn Road approximately 4 km south of Appin (Figure 1).

The proposal is to replace the existing refuelling station at West Cliff Colliery. The exiting station is nearing the end of its operational life and poses an unacceptable threat to the environment from risk of leakage and to the safety of employees due to constrained and unsafe truck movements as a result of increasing demand and use (Cardno Forbes Rigby 2008).

The diesel storage facility and new refuelling station is proposed in an area alongside Wedderburn Road away from other truck movements (Figure 2). The storage facility will consist of a 105,000 litre above ground, self bunded facility with dimensions of 14.7 m long by 2.45 m wide by 3.20 m high (as shown in Figure 3). The facility will be equipped with up to date technology including overfill protection, alarms, bunding and will comply with BHP Billiton Fatal Risk Control Protocols, AS 1940-2004 'The Storage and Handling of Flammable and Combustible Liquids' (Standards Australia 2004) and NSW EPA requirements. The facility will also include a separate refuelling station for trucks and light vehicles. Figure 4 is a plan of the entire proposed facility.

Figure 1: Location of West Cliff Colliery

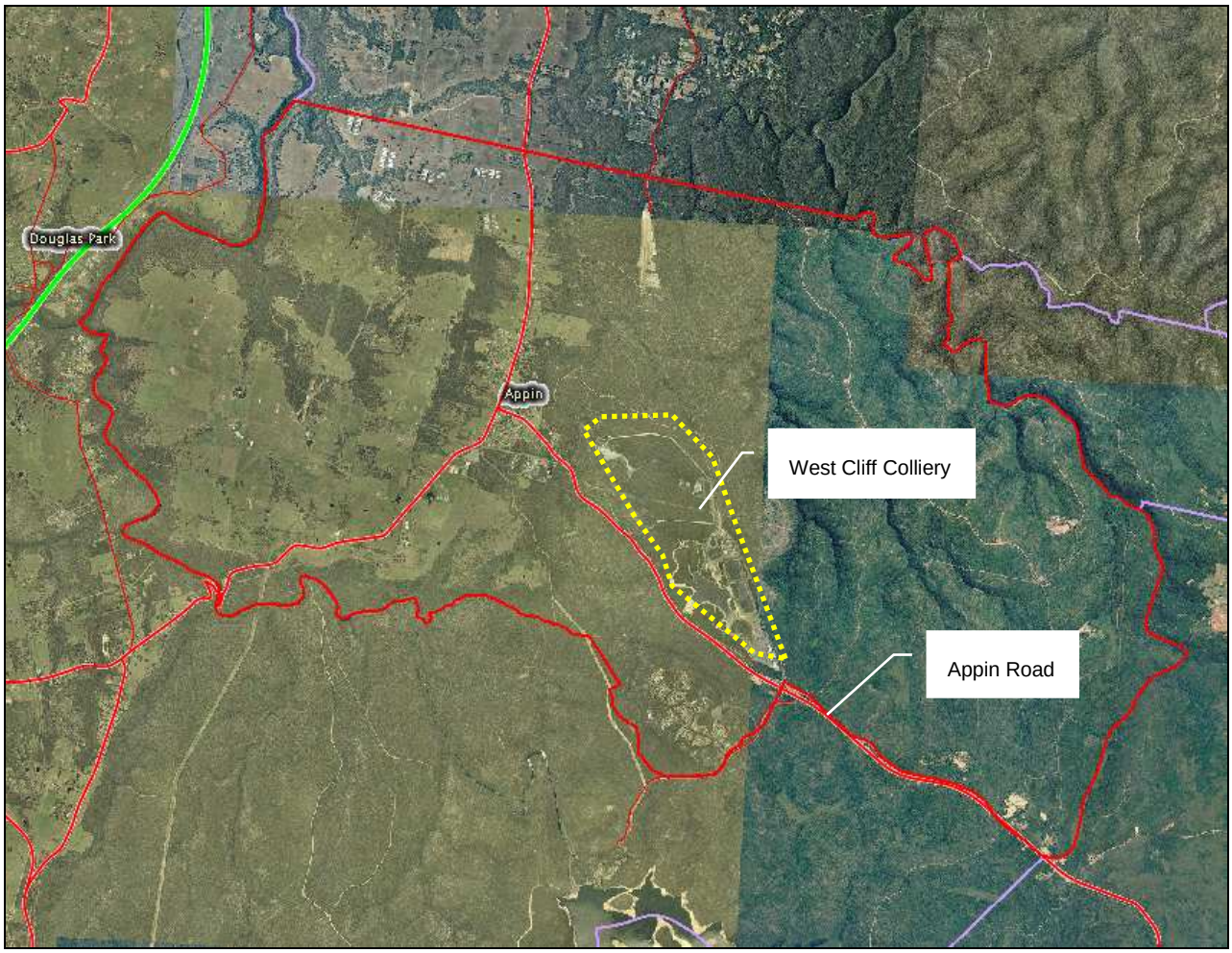

Figure 2: Proposed location of facility

Source: Cardno Forbes Rigby (2008)

Figure 3: Example of proposed diesel storage

Source: Cardno Forbes Rigby (2008)

Figure 4: Proposed diesel storage and refuelling facility

PART B Legislation and bushfire protection assessment requirements

The development site is identified as bushfire prone land by Wollondilly Shire Council. As the development will be assessed under Part 3A of the *Environmental Planning and Assessment Act 1979*, the Minister for Planning is to take into account bushfire risk, and proponents should consider the document 'Planning for Bushfire Protection' (NSW Rural Fire Service 2006) when undertaking environmental assessments (NSW Rural Fire Service 2006; pg 6).

'Planning for Bushfire Protection' (PBP), however, does not provide for any bushfire specific performance requirements for non-habitable buildings and industrial facilities, and as such there is not a set of deemed to satisfy provisions for the application of Asset Protection Zones (APZ) and building construction standards to these types of developments under PBP. Instead, the aim and objectives of PBP apply in relation to other matters such as access, water and services, emergency planning, and landscaping/vegetation management (NSW Rural Fire Service 2006; pg 46). An assessment of the development proposal against the aim and objectives of PBP is contained within Section D of this report.

PART C The bushfire environment

This section details the environmental and bushfire characteristics, such as vegetation, ecological, topographical and land use data, required to make informed decisions on the application of bushfire protection measures.

The proposed development site is situated amongst Sydney Sandstone Woodland common to the surrounding area and Dharawal State Conservation Area (NPWS 2006). This vegetation will lie to the north, east and south of the proposed facility as shown in Figure 2. The site is situated on the plateau and gently slopes downhill to the west towards the Colliery. Fire approaching the proposed facility would do so downslope.

The area has experienced large scale bushfire in the fire seasons of 1990-1991 and 2000-2001, and been threatened by nearby large fires during the seasons of 1981-1982 and 1992-1993 (NPWS 2006). The fire paths in the area are predominately from west to east under hot and dry westerly winds. It is noted that the proposed facility site is located on the western side of the bushland 'upwind' of the predominant fire weather in the region.

C.1. Vegetation types and coverage

In accord with PBP the predominant vegetation class has been determined for a distance of at least 140 m out from the proposed facility in the direction of the bushfire hazard, that is, generally to the north, east and south.

The bushland is Exposed Sandstone Scribbly Gum Woodland (NPWS 2006) common to the higher and exposed areas of the plateau. For the purpose of applying PBP 2006, the vegetation would be classified as 'open forest' due to the presence of high fuel loads within the heathy and shrubby understorey.

C.2. Slopes influencing fire behaviour

In accord with PBP the slopes that would most significantly influence fire behaviour was determined for a distance of at least 100 m out from the proposed building in the direction of the bushland. This assessment was made with a survey plan with 0.5 m contour intervals (Figure 4) and verified on the ground by BES.

The bushland is on a downslope of 1 degree to the south, and on an upslope of 1 degree to the north and west beyond Wedderburn Road.

PART D Assessment and recommended bushfire protection measures

This section discusses the assessment of the proposal against the aim and objectives of PBP as required for this type of development.

The aim of PBP is to "*use the NSW development assessment system to provide for the protection of human life (including firefighters) and to minimise impacts on property from the threat of bushfire, while having due regard to the development potential, on-site amenity and protection of the environment*."

The development proposal meets the aim of PBP by virtue of the nature of the development (a minor addition to an industrial facility). As discussed further below, the proposed development would not significantly decrease the existing level of bushfire protection for workers and emergency personnel. The development is also not considered an asset that requires specific bushland building setbacks or construction standards under PBP.

Objective 1 of PBP is to "afford occupants of any building adequate protection from exposure to bushfire".

The proposal does not consist of a dwelling or building, and the development is not expected to offer protection for people from a passing fire front. Workers and employees are also not expected to defend the facility from fire and would be evacuated should a bushfire threaten the site. This objective is satisfied.

Objective 2 is to "provide for defendable space to be located around buildings".

The proposed roads accessing the refuelling facility (see Figure 4) will act as defendable space for the facility and diesel storage. These roads can be used by fire services to attend to fire at the facility. This objective is satisfied.

Objective 3 is to "provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition".

The facility will be constructed from non-combustible materials are will not be at risk from material ignition. This objective is satisfied.

For the purposes of storage and handling, diesel is not classified as a dangerous good by the criteria of the Australian Dangerous Goods (ADG) Code, but is considered as a Class 1 combustible liquid (BP Australia 2002). If exposed to the outside elements, a diesel fire could occur if it is ignited (flash point 61-150 degrees Celsius). The diesel storage facility is therefore proposed to comply with AS 1940-2004 'The Storage and Handling of Flammable and Combustible Liquids' (see Figure 3 for example). The storage vessel will not be exposed to external elements and Section 5.9.4 of AS 1940-2004 requires above ground tanks to be fire rated to a standard of FRL 240/240/240 or equivalent.

Should the diesel become otherwise exposed to an approaching bushfire and ignited in the form of a leak, such as a diesel bund fire in the proposed containment area (see Figure 4), the resultant fire would produce a similar radiant heat at a 50 m distance compared to the ambient bushfire radiant heat expected under a worst-case design fire under PBP. Modelled tests of a diesel bund fire of 62 m in diameter capable of containing 1.5 ML of diesel have shown the distance at which 10 kW/m^2 of radiant heat is experienced at 2 m height is only 50 m (KBR 2005). Ten kW/m^2 is the upper threshold of radiant heat flux acceptable for evacuation operations of 'Special Fire Protection Purpose' developments under PBP, such as retirement villages and hospitals. A PBP design fire under PBP approaching the proposed facility site through the surrounding vegetation would produce a radiant heat flux ranging from 8 to 12 kW/m^2 at 50 m depending on a fuel load range of 20 to 30 tonnes per hectare. It is noted that a smaller fire in initial stages of development with less radiant heat may also ignite a spill. It is also important to note that the bund fire example is extreme and contains 30% more diesel volume than proposed to be stored onsite and at least twice the diameter of the proposed spillage containment area. Nevertheless, it demonstrates the effects of a diesel fire at the site.

The proposed facility is also greater than 450 m to the nearest buildings to the northwest and west, and over 900 m from the central area of the Colliery to the south. The facility is surrounded by stockpiles to the west and roads and bushland to the east. On a consequence basis alone there would be no impact to life and property and no incident escalation at the site.

The diesel storage will have a vegetation separation distance ranging from 20 m to 40 m due to the proposed surrounding roads.

Objective 4 is to "ensure that safe operation access and egress for emergency service personnel and residents is available".

As the proposed development provides for large truck movements, there is adequate access to proposed assets for firefighting operations. There is adequate access to Wedderburn Road in the chance that the site is evacuated due to bushfire. This objective is satisfied.

Objective 5 is to "provide for ongoing management and maintenance of bushfire protection measures, including fuel loads in the asset protection zone (APZ)".

There is no specific asset protection zones incorporated into the development. This objective is satisfied.

Objective 6 is to "ensure that utility services are adequate to meet the needs of firefighters (and others assisting in bushfire fighting)".

Utility services such as water supply are existing as part of the Colliery. Section 11 of AS 1940-2004 requires the facility to comply with aspects of fire protection such as the provision of fire extinguishers. This objective is satisfied.

PART E Conclusion and summary

In the author's professional opinion the recommendations within this report will provide an appropriate standard of bushfire protection for the proposed development consistent with aim and objectives of 'Planning for Bushfire Protection' (NSW Rural Fire Service 2006).

There is no additional bushfire protection measures recommended within this report. The report assesses the proposed development against the aims of objectives of PBP and demonstrates that these are satisfied.

David Peterson
Senior Bushfire Planner

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