

BUSHFIRE ASSESSMENT REPORT

**-Sandy Hollow Solar Farm-
1333 Golden Highway
Sandy Hollow**



PREPARED BY:



JUNE 2019

PEAK LAND MANAGEMENT

Land management consulting services:

-Bushfire-

-Ecological-

-Environmental-

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Cover Photo: View of subject site.

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Document History

Document Id.	Prep. Date	Version	Submitted to:
Bushfire Assessment Report	17.5.19	1	Jacqueline O'Neill, ngh environmental
Bushfire Assessment Report	27.6.19	2	Stephanie Anderson, ngh environmental

AUTHOR DETAILS

Ted Smith is the director of PEAK LAND MANAGEMENT. He is a qualified Land Management Consultant with a Bachelor of Science Honours Degree majoring in Physical Geography. He has over 25 years experience commercially consulting with PEAK LAND MANAGEMENT PTY LTD and working within state government.

Ted has completed a Graduate Diploma in Design for Bush Fire Prone Areas from the University of Western Sydney and is a member of the Fire Protection Association of Australia (FPA of Australia), being a BPAD Accredited Bush Fire Practitioner Level 3.

CERTIFICATION

Ted Smith of PEAK LAND MANAGEMENT has carried out a bush fire assessment including a site inspection on the subject property. A detailed Bush Fire Assessment Report is attached which includes the submission requirements set out in *Appendix 2 & 4 of Planning for Bush fire Protection 2006* together with recommendations as to how the relevant specifications and requirements are to be achieved.

I hereby certify, in accordance with Section 4.14 of the *Environmental Planning and Assessment Act 1979 No 203*:

1. That I am a person recognised by the *NSW Rural Fire Service* as a qualified consultant in Bush fire Risk Assessment; and
2. That subject to the recommendations contained in the attached Bush Fire Assessment Report the proposed development conforms to the **relevant specifications and requirements** being the document entitled *Planning for Bush Fire Protection* prepared by the NSW Rural Fire Service in co-operation with the Department of Planning and any other document as prescribed by Section 4.14 of the *Environmental Planning and Assessment Act 1979 No 203*.



Signature

27th June, 2019

Date



TERMS AND ABBREVIATIONS

Abbreviation	Meaning
AHIMS	Aboriginal Heritage Information Management System
APZ	Asset Protection Zone
AS2419 -2005	Australian Standard – Fire Hydrant Installations
AS3959-2009	Australian Standard – Construction of Buildings in Bush Fire Prone Areas
BCA	Building Code of Australia
BPA	Bush Fire Prone Area (Also Bushfire Prone Land)
BPL	Bush Fire Prone Land
BPL Map	Bush Fire Prone Land Map
BPMs	Bush Fire Protection Measures
BRMP	Bushfire Risk Management Plan
BTA	Bushfire Threat Assessment
Defendable Space	An area within the asset protection zone that provides an environment in which a person can undertake property protection after the passage of a bush fire with some level of safety.
EPA Act	<i>NSW Environmental Planning and Assessment Act 1979</i>
EMP	Emergency Management Plan
FDI	Fire Danger Index
FMP	Fuel Management Plan
ha	hectare
IPA	Inner Protection Area
LEP	Local Environment Plan
LGA	Local Government Area
LMCC	Lake Macquarie City Council
OPA	Outer Protection Area
PBP 2006	Planning for Bushfire Protection 2006
RF Act	<i>Rural Fires Act 1997</i>
RF Regulation	Rural Fires Regulation
SEARs	Depart of Planning & Environment - Secretary's Environmental Assessment Requirements

1.0 INTRODUCTION

PEAK LAND MANAGEMENT has been engaged by nvh environmental to prepare a Bushfire Assessment Report for a proposed commercial Solar Farm development located at Lot 12 DP 1042612/ 1333 Golden Highway, Sandy Hollow (referred to hereafter as “subject site or proposed development”).

The project is a Regionally Significant Development, being assessed by Muswellbrook Shire Council.

Figures 1-4 show the subject site location, topographic map, development proposal, ecological constraints, and Appendix 1 shows photos of the subject site.

Under the *Environmental Planning and Assessment Act, 1979* (and its regulations), and the *Rural Fires Act 1997* (and its regulations), councils are required to assess and control new developments in bushfire prone land mapped areas. This land and surrounds have been part mapped as Bush Fire Prone (Fig 5), with the majority of the site not mapped where solar panels are proposed.

Recommendations are made despite this in order to provide a reasonable level of bushfire safety to the facility.

The proposed development is predominantly a Class 8 building under the Building Code of Australia (BCA). As stated in Planning for Bushfire Protection Guidelines (PBP) 2006 it should be noted that *“Buildings of Class 5 to 8 and 10 of the BCA- The BCA does not provide any bush fire specific performance requirements and as such AS 3959 does not apply as a set of deemed to satisfy requirements. The general fire safety construction provisions are taken as acceptable solutions, but the aim and objectives of PBP 2006 apply in relation to other matters such as access, water and services, emergency planning and landscaping/vegetation management”*.

This report aims to address PBP 2006, in order to allow development assessment & approval.

Figure 1: Topographic map showing subject site and surrounds (imagery from Lands Department)

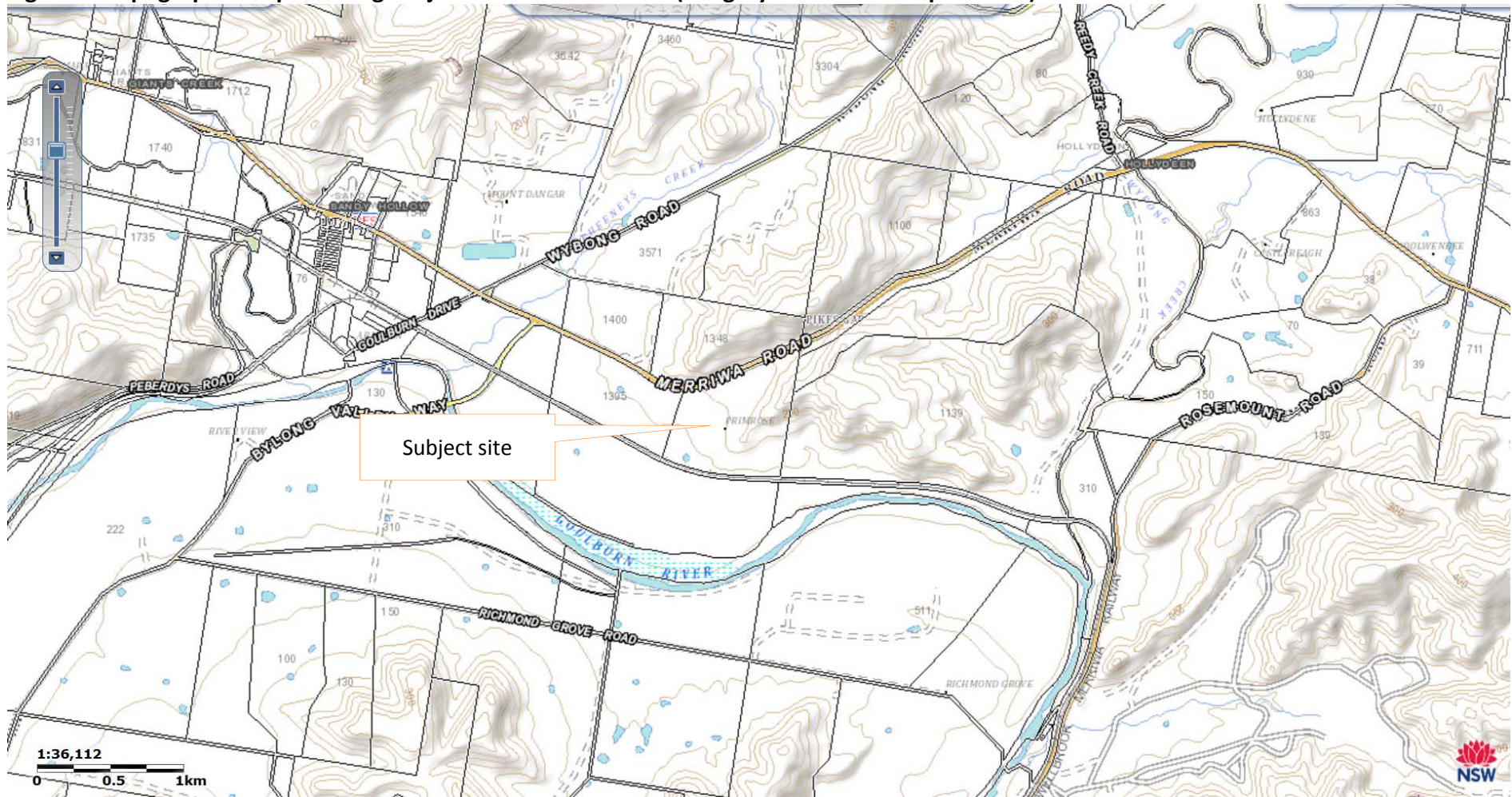
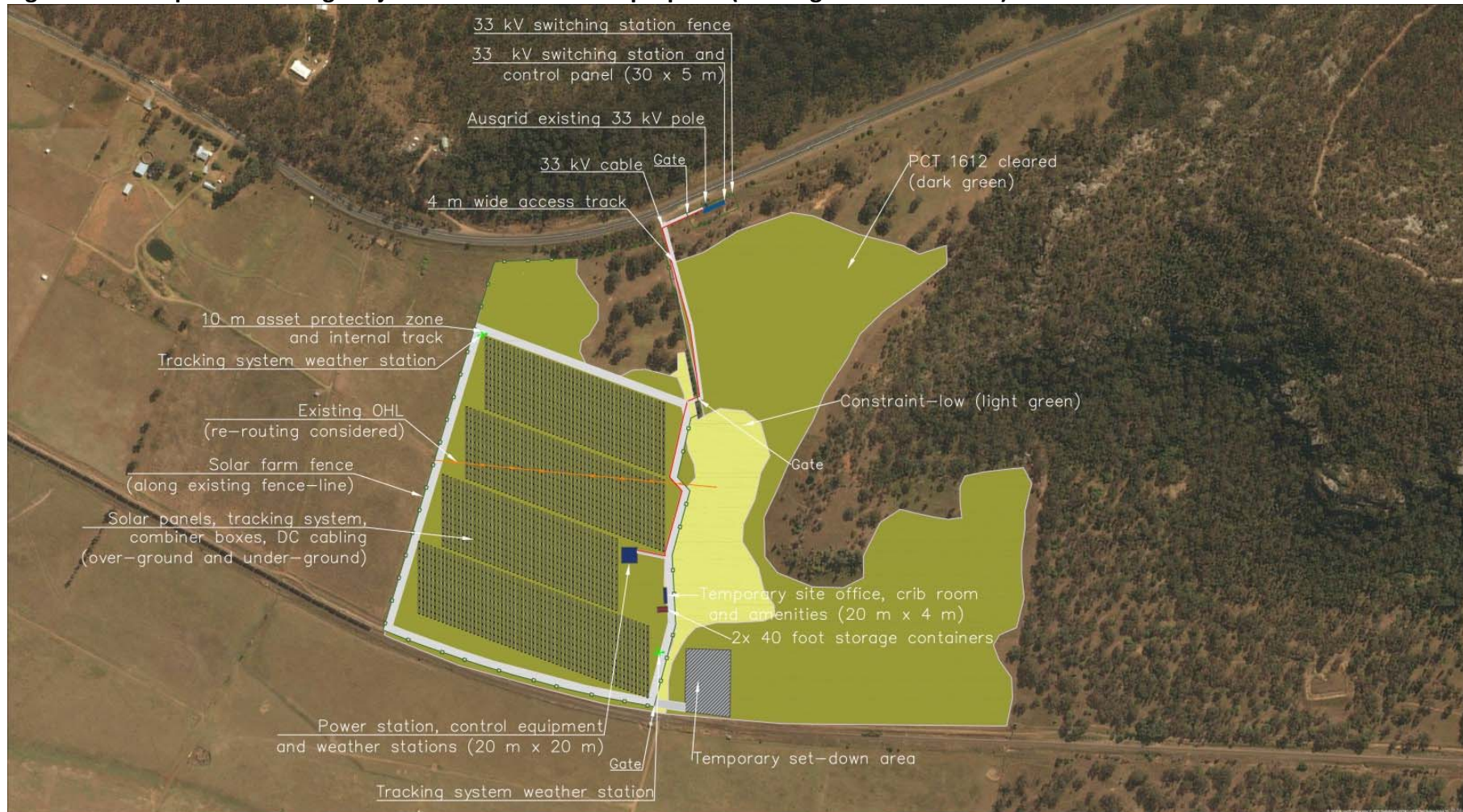


Figure 2: Aerial photo showing subject site and solar farm proposal (from ngh environmental).



	Notes: Indicative preliminary design. Not for construction.	Project name:	Drawn by:	Checked by:				
		Sandy Hollow Solar Farm	TSP					
		Drawing title:	Scale:	Date:				
		Preliminary layout		15/04/2019				
		Dwg no.:						
		012						
			B	1/05/19	Updated based on review comments	TSP		
			Rev.	Date	Comments	By		
			Job No. 12					

Figure 3: Bushfire Prone Land Map (from NSW Planning Portal)

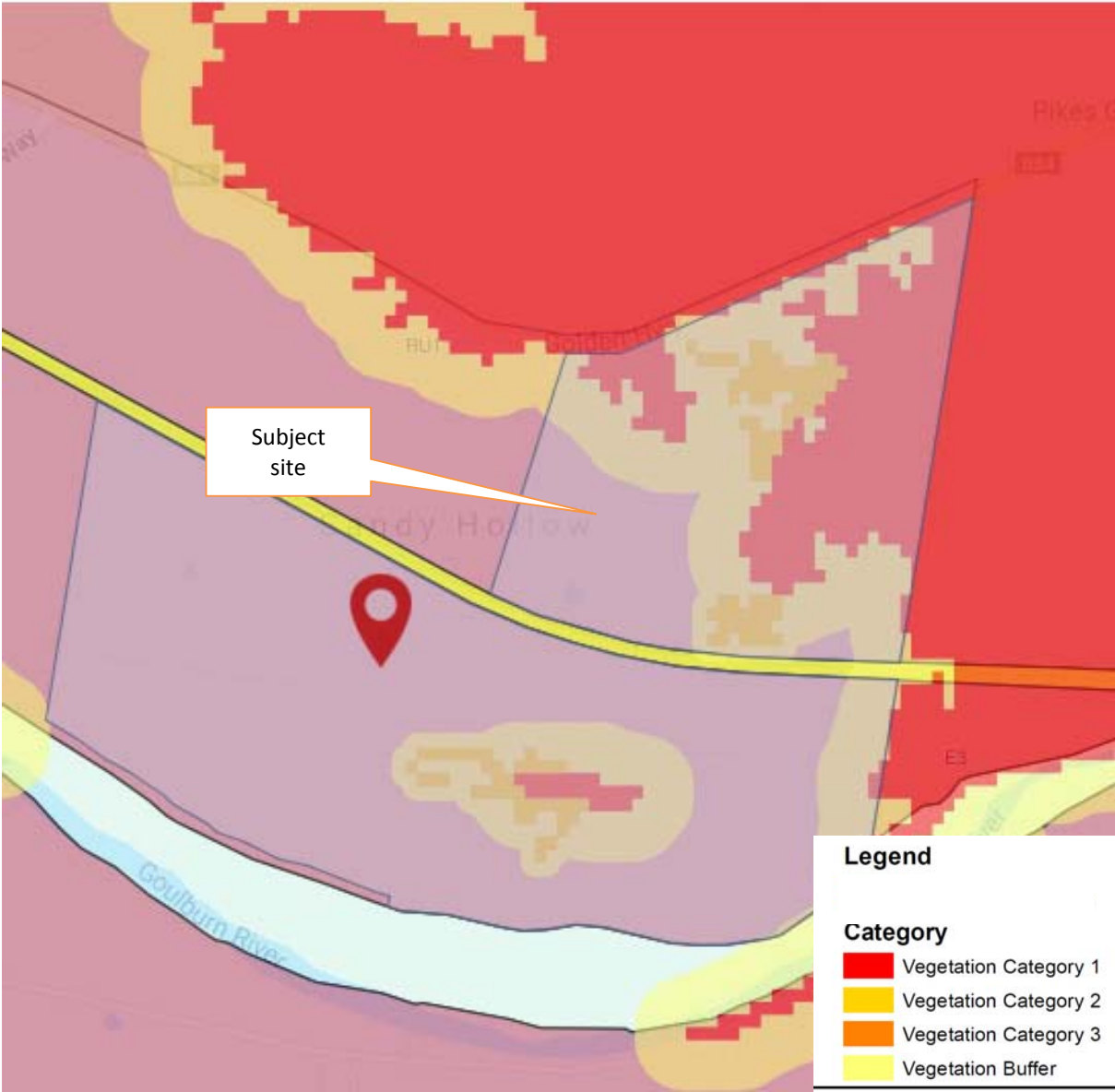
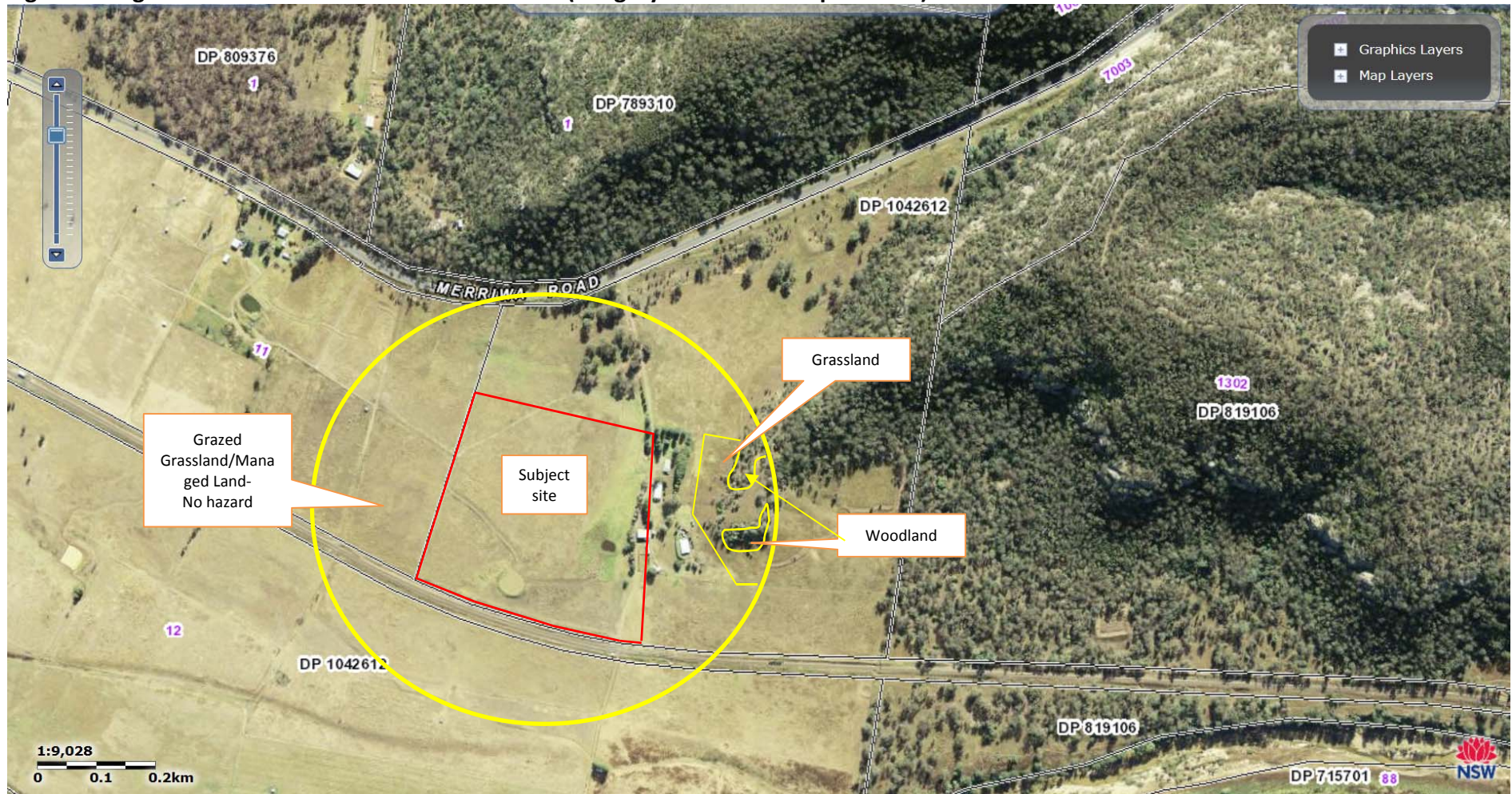


Figure 4: Vegetation assessment within 140m of site (imagery from Lands Department)



2.0 SITE DESCRIPTION AND SURROUNDING LANDUSE

The site is located in a rural area, which is grazed by cattle permanently.

The proposal is shown in Figure 2 and is described by ngn environmental:

“Vernon Trust proposes to construct a photovoltaic solar farm at Sandy Hollow. The development site is agricultural land with a history of clearing for grazing. The proposal involves the development of a solar farm and switching station across the northern section of the lot. The solar farm would include installation of photovoltaic (PV) cells, with a capacity of approximately 6MW, on a tracking system supported on pole driven steel posts. The development comprises approximately 16 hectares. The solar farm would connect to the existing 33kV line (Denman to Merriwa) via a new switching station. The proposed works will involve ground surface disturbances, changes to land uses and the local visual environment. This development application relates to land at 1333 Golden Highway, Sandy Hollow. The land is legally identified as Lot 12 DP 1042612. The land is situated on the southern side of the Golden Highway.”

An overview of the key infrastructure items to be established for the project relevant to bushfire include:

- each solar panel would be fixed to a metal mounting structure;
- above ground DC cabling;
- underground DC cabling;
- underground AC cabling would run from the PCUs to the solar substation;
- internal vehicle access tracks including a 10m wide Asset Protection Zone around the solar panel development and perimeter road;
- perimeter safety fencing;
- a permanent all weather access and access road; and
- temporary site compound, lay-down area, and equipment storage areas.

There will be no overnight accommodation, being a temporary site office building during construction only.

3.0 VEGETATION

The predominant vegetation type within 140m is Grassland and Woodland assessed as per AS 3959 and PBP 2006 (Figure 4, Appendix 1 - photos).

The subject site is located in a grazed rural area, with low bushfire risk present. No vegetation has been mapped as bushfire prone over the site or within 50m of it under Muswellbrook Shire Councils Bushfire Prone Land Map (Fig 3), however the site is partially within the 100m buffer zone. The subject development site is to be developed and most remaining grassland removed or slashed regularly.

The areas mapped as Grassland within 140m had grass over 100mm high at time of inspection, being grazed by Kangaroos only, with no cattle present at time of inspection, and have therefore been assessed as unmanaged Grassland. Grassland is recognised under PBP 2006, with 10m wide recommended Asset Protection Zones.

Areas mapped as managed land/grazed paddocks are continuously grazed and/or slashed and have managed grass understorey. Scattered trees are present in some of these areas with managed understorey, and no canopy connection to surrounding forested land, and are assessed as managed land (equivalent to an Asset Protection Zone).

Some small pockets of remnant Woodland are present to the east of the subject proposal site, over 120m away, which are mapped as Woodland, although these areas are also grazed, but have connectivity to surrounding bush land and sparse understorey present.

4.0 SLOPE

Slope assessment has been carried out around the subject site under hazardous vegetation out to 100 metres as specified under the Guidelines Assessment Procedure. The angles have been measured in the field by an inclinometer. Table 1 shows the results.

5.0 ENVIRONMENTAL FEATURES

A full Ecological Assessment is being carried out by Ngh environmental. They state:

“The majority of the proposal area is within cleared areas subject to historical agricultural land use, however small areas of remnant woodland occur and border the proposal boundary and road reserve. The clearing currently proposed (13.75ha) would trigger the Biodiversity Offsets Scheme (BOS) thresholds, however the clearing and operational impacts of the proposal are unlikely to generate a significant impact to any listed community, species or population should the woodland areas be avoided. No TECs or threatened flora species were observed at the site and in consideration of the disturbance through the proposal area, there is limited available habitat. Significant impacts are unlikely given the small area of marginal and degraded habitat.”

6.0 ABORIGINAL FEATURES

An Aboriginal archeological survey/or AHIMS search has been undertaken by the proponent, which showed no AHIMS sites or any Aboriginal features over the subject site.

Ngh environmental state:

“There were 47 sites AHIMS sites within a 1km buffer of the study site, however the closest was 930m from the development footprint, and the Aboriginal heritage due diligence assessment concluded that the proposal would not impact an Aboriginal places, sites or items”.

7.0 BUSHFIRE ASSESSMENT

The legislation as it relates to this site calls for asset protection zones (APZ) to be established around the proposed development, provision of adequate access, design staging and citing of the development and provision of appropriate water supply for bushfire fighting purposes.

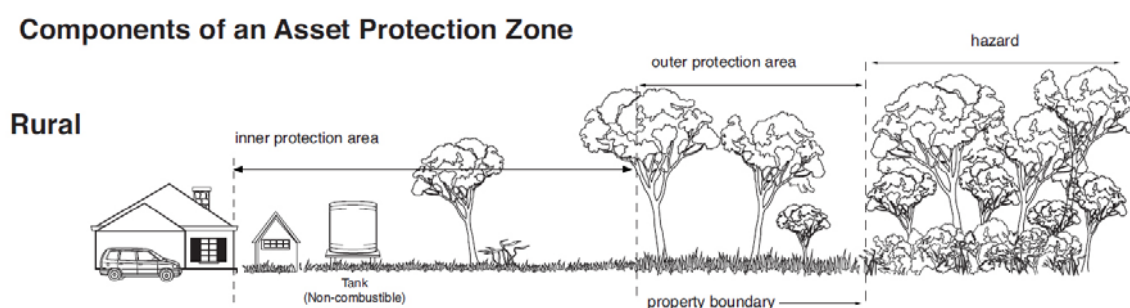
7.1 Setbacks including asset protection zones

Table 1 shows the bushfire threat assessment for the subject site. Figure 5 shows a graphical representation of the recommended Asset Protection Zone.

Table 1: Bushfire Threat Site Assessment for proposal

DIRECTION TO BUSHFIRE HAZARD	MOST SIGNIFICANT GRADIENT	PREDOMINANT VEGETATION TYPE WITHIN 140m as per PBP 2006	Distance to hazard (from proposed development)	Recommended Asset Protection Zone (from PBP,2006)
East	Upslope	Grassland	81m	10m
East	Upslope	Woodland	130m	10m

Figure 5: Components of an Asset Protection Zone (from PBP 2006)



7.2 Water supplies and utilities

The subject site is not serviced by reticulated town water supplies. Two small dams of approximately 0.1 megalitre water capacity are to be removed over the site, and replaced with a stormwater detention basin constructed immediately south of the solar array with an estimated volume of 1,700m³ (1.7 megalitres). Access to irrigation water supply is also available.

The proposed development will have a non combustible 20 000 litre water tank with Storz fitting, and other fire fighting equipment in compliance with Australian Standards.

The subject site is serviced by above ground power to the site. There are no permanent proposed gas tanks/bottling.

7.3 Access

The site is accessed from the Golden Highway, a major sealed public through road/highway.

A perimeter access maintenance track will be provided around the development, which will be also part of the managed proposed 10m wide Asset Protection Zone.

An unsealed good quality PBP, 2006 complying property access road to the existing homestead over the property will be retained.

There is ample room for fire fighting vehicles to access and turn around on site.

7.4 Construction standards

No construction standards are applicable for this development as it is a commercial development, with no habitable buildings proposed.

PBP, 2006 states “Buildings of Class 5 to 8 and 10 of the BCA- The BCA does not provide any bush fire specific performance requirements and as such AS 3959 does not apply as a set of deemed to satisfy requirements. The general fire safety construction provisions are taken as acceptable solutions, but the aim and objectives of PBP 2006 apply in relation to other matters such as access, water and services, emergency planning and landscaping/vegetation management.”

This report has addressed PBP, 2006 aims and objectives.

7.5 Other fire protection measures/Evacuation Plan/Landscaping

The subject site has adequate managed grounds and the proposed Asset Protection Zone will be managed to an IPA standard.

An Emergency Evacuation Plan is required, nominating an emergency meeting point, and preferred evacuation route, and methodology for ensuring all occupants are safe and accounted for. In regards to bushfire, the threat at this site is considered low, being possible ember and smoke attack only assuming the Asset Protection Zone is maintained over the site and surrounds. Therefore the safest place would be to stay within the development as it will protect occupants from embers in the air/ and smoke if all windows and doors are shut, or to evacuate to the caretakers residence.

All landscaping within the 10m Asset Protection Zone should be in accordance with Asset Protection Zone requirements as detailed within the Rural Fire Service document NSW Rural Fire Service, 2005. *Standards for Asset Protection Zones*.

Other non compulsory measures which are recommended to improve bushfire safety include:

- Local Fire & Rescue Brigade informed of proposal once approved regarding its operation, water supplies, and layout;
- Gutters cleaned annually (if relevant);
- All doors closed during bushfire in local area;
- The interior of any buildings will have all necessary fire safety provisions (sprinklers, fire extinguishers, etc) as required by the relevant Australian Standards and legislation.

8.0 BUSHFIRE RECOMMENDATIONS

In order to gain development approval the following supporting information should be considered:

It is recommended that:

- ❑ **Asset Protection Zone:** - At the commencement of building works and in perpetuity the entire solar development site (ie solar panel area, Asset Protection Zone and around buildings only) including nominated 10m wide Asset Protection Zone (see Fig 2) should be managed as an Inner Protection Area Asset Protection Zone as outlined within section 4.1.3 and Appendix 5 of Planning for Bushfire 2006 and the NSW Rural Fire Service's document Standards for Asset Protection Zones.

In summary PBP 2006 states “it should consist of mown grass, concrete, pavers, pebbles, small clumps of vegetation, isolated trees, etc. Lawns and garden should be maintained so that they do not become overgrown, vegetation does not grow over or touch the dwelling, and canopy of trees do not touch or become continuous with the surrounding bushland (at least 2-5 metres between tree canopies).

Please note that isolated paddock trees, woodlots, conservation areas can be retained as they are relatively small in size and of a low risk, so long as vegetation does not touch the proposed solar array panels, and access is maintained around the perimeter.

- ❑ **Water and Utilities:** - The intent of measures is to provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building. To achieve this, the following conditions should apply:
 - Water, electricity and gas shall comply with section 4.1.3 of ‘Planning for Bush Fire Protection 2006’.
 - The proposed development is to have a non combustible 20 000 litre dedicated water tank with Storz fitting, and other fire fighting equipment in compliance with Australian Standards. Dedicated fire fighting water supply from either this tank or detention basin dam, is specifically for fire tanker refilling/on site fire fighting.
- ❑ **Access:-** The intent of measures for property access is to provide safe access to/from the public road system for fire fighters providing property protection during a bush fire and for occupants faced with evacuation. To achieve this, the following conditions shall apply:
 - ❑ The internal property access road, and perimeter access road, shall conform to PBP 2006. Property Access roads should have a minimum 4m vertical clearance to any overhanging obstructions, and be 4m wide with 1m traversable grassed shoulders, unsealed/sealed all weather traversable road. Road grade should be less than 10⁰, short steep sections are acceptable if sealed and <15⁰. Two way traffic flow around the perimeter of the site which enables safe access & egress for emergency services and allow crews to work with equipment about the vehicle is to be provided by the proposed perimeter road & Asset Protection Zone.

- ❑ **Evacuation and Emergency Management:** - The intent of measures is to provide suitable emergency and evacuation (and relocation) arrangements for occupants of special fire protection purpose developments. To achieve this, the following conditions shall apply:
 - ❑ A Bush Fire Emergency Management and Evacuation Plan shall be prepared consistent with 'Development Planning- A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan December 2014' and Australian Standard AS3745 2010 'Planning for Emergencies in Facilities'.

The Plan shall be prepared in consultation with NSW RFS District Fire Control Centre. The Plan shall include:

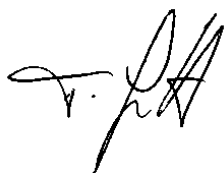
- 24/7 contact details including alternative telephone contact;
- Site infrastructure plan;
- Fire fighting water supply plan;
- Site access and internal road plan;
- Construction of asset protection zones and their continued maintenance;
- Location of hazards (Physical, Chemical and Electrical) that will impact on fire fighting operations and procedures to manage identified hazards during fire fighting operations;
- Such additional matters as required by the NSW RFS District Office (Plan review and update).

The following information is provided for the proponent in order to improve Bush fire safety if desired. It is not compulsory under PBP, 2006:

- ❑ A petrol or diesel or solar powered fire fighting pump and 30m hose reel with steel nozzle is recommended, and can be mounted on a 4WD with water tank. This can be used for grass fire/ember attack fighting by the proponent in the advent of a fire.
- ❑ Landscaping- Whole of solar panel & building site to be developed and therefore not applicable. If scattered trees are retained and visual screening used these are acceptable as part of the Asset Protection Zone, assuming vegetation does not touch the solar array/impepe perimeter access track/road/meets Asset Protection Zone requirements.

The bushfire risk is considered to be adequately managed in regards to the proposal over the site, in conjunction with approval conditions from the relevant statutory authorities.

Report prepared by:



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PEAK LAND MANAGEMENT PTY LTD

DISCLAIMER: Whilst every effort is made to present clear and factual information based on fieldwork and current legislation no guarantee is made that the development or its occupants are safe from bushfire, or will be approved, as this is in the hands of the approving statutory authorities/certifier. No warranty or guarantee, whether expressed or implied, is made with respect to the observations, information, findings and inclusions expressed within this report. No liability is accepted for losses, expenses or damages occurring as a result of information presented in this document.

9.0 REFERENCES

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Websites

www.rfs.nsw.gov.au

[nearmap](#)

[Lands Department- SIX Maps](#)

[NSW Planning Portal](#)

APPENDIX 1: PHOTOS OF SITE AND SURROUNDS

Property access road from Golden Highway



Managed Grassland to north-east of subject site



Managed Grassland over subject solar panel building footprint –looking south-west



Managed Grassland over subject solar panel building footprint –looking south



Managed Grassland to north of subject solar panel building footprint. Scattered trees can be retained.



Managed Grassland to south of subject site



Managed Grassland to west of subject site



Existing buildings to east of subject solar panel footprint with managed land surrounds



Woodland in background to east



Existing buildings to east of subject solar panel footprint with managed land surrounds

