MALABAR COAL

Scoping Report

MAXWELL SOLAR FARM

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NGH Environmental Pty Ltd (ACN: 124 444 622. ABN: 31 124 444 622)

www.nghenvironmental.com.au e ngh@nghenvironmental.com.au

Sydney Region
18/21 mary st
surry hills nsw 2010 (t 02 8202 8333)

Canberra - NSW SE & ACT
8/27 yallourn st (po box 62)
fyshwick act 2609 (t 02 6280 5053)

Brisbane
8 trawalla st
the gap qld 4061 (t 07 3511 0238)

Newcastle - Hunter and North Coast
unit 2, 54 hudson st
hamilton nsw 2303 (t 02 4929 2301)

Wagga Wagga - Riverina and Western NSW
suite 1, 39 fitzmaurice st (po box 5464)
wagga wagga nsw 2650 (t 02 6971 9696)

Bega - ACT and South East NSW
89-91 auckland st (po box 470)
bega nsw 2550 (t 02 6492 8333)

CONTENTS

ABBREVIATIONS AND ACRONYMS

ABS	Australian Bureau of Statistics
ACHA	Aboriginal Cultural Heritage Assessment
ACHCRP	Aboriginal Community Consultation Requirements for Proponents
AEMO	Australian Energy Market Operator
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
ARAS	Archaeological Risk Assessment Services Pty Ltd
BC Act	*Biodiversity Conservation Act 2016* (NSW)
CCC	Community Consultative Committee
CCP	Community Consultation Plan
CL	Coal Lease
CoA	Conditions of Approval
DECCW	Department of Environment Climate Change and Water
DP&E	Department of Planning and Environment (NSW)
DPI	Department of Primary Industries
DRG	Division of Resources and Geoscience
EEC	Endangered Ecological Community (listed under NSW BC Act)
EIS	Environmental Impact Statement
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwth)
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
GW	Gigawatt
ha	hectares
Heritage Act	*Heritage Act 1977* (NSW)
ISEPP	*State Environmental Planning Policy (Infrastructure) 2007 (NSW)*
km	kilometres
kV	kilovolt
LEP	Local Environment Plan
LGA	Local Government Area
LLS	Local Land Services
m	metres
MAC	Mt Arthur Coal
MNES	Matters of National Environmental Significance under the EPBC Act
MOP	Mining Operations Plan
MW	megawatts
NEM	National Energy Market
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NSW	New South Wales

OEH	(NSW) Office of Environment and Heritage, formerly Department of Environment, Climate Change and Water
PAC	Planning Assessment Commission
PCT	Plant Community Type
PV	Photovoltaics
RAPs	Registered Aboriginal Parties
RET	Renewable Energy Target
RMS	Roads and Maritime Services
SEARs	Secretary's Environmental Assessment Requirements (issued by DPE)
ISEPP	State Environmental Planning Policy (Infrastructure)
SSD	State Significant Development, defined in the ISEPP
%	Per cent
^{0}C	Celsius

1 INTRODUCTION

1.1 PURPOSE OF THIS DOCUMENT

Maxwell Solar Pty Ltd (Maxwell) proposes to develop a solar farm, to be known as the Maxwell Solar Farm ('the proposal') at Maxwell Infrastructure, (previously named the "Drayton Mine"), approximately ten kilometres south-south east of Muswellbrook, New South Wales (NSW). This Scoping Report provides a description of the proposal by Maxwell to construct and operate the Maxwell Solar Farm, describes the site and its surroundings and the statutory framework for approval and identification of key potential environmental issues that may be associated with the Maxwell Solar Farm proposal. The report has been prepared to support a request to the Department of Planning and Environment (DP&E) for the Secretary's Environmental Assessment Requirements (SEARs) which would guide the preparation of an Environmental Impact Statement (EIS) for the proposal under Division 4.1, previously part 4, of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The new *Large-Scale Solar Energy Guideline for State Significant Development* (NSW Government, 2018) provides guidance on the planning framework and assessment process for State Significant large-scale energy projects, such as the Maxwell Solar Farm. The process in developing the proposal is consistent with the Guideline and the Scoping Report fulfils the scoping phase.

1.2 BACKGROUND

The Drayton Mine Extension Project was approved as a Part 3A project in February 2008. Since approval, the site has been subject to modifications, and is now subject to Consolidated Conditions of Approval (CoA's) issued following approval of Modification 2 – Tailings Emplacement, determined on the 17 February 2012. As part of the CoA, the site has been progressively rehabilitated in accordance with the Landscape Management Plan and the Mine Operation Plan (MOP), approved by the Department of Planning and Environment (DPE).

The proposed Maxwell Solar Farm would be located on land currently subject to Coal Lease No. 229 (CL 229), which is held in respect of Maxwell Infrastructure. It is also subject to an existing approval for the Drayton Mine Extension Project, granted by the Minster of Planning under Part 3A of the EP&A Act on 1 February 2008 (Part 3A approval). Additionally, this land is part of the premises regulated by Environment Protection Licence No. 1323 (EPL 1323), issued under the *Protection of the Environment Operations Act 1997* (POEO Act). The proposed Maxwell Solar Farm would be sited within part of the rehabilitated area of Maxwell Infrastructure. Malabar Coal Ltd is the owner of Maxwell and is also developing the Spur Hill Underground and Maxwell Underground Projects, refer to Figure 1-1, to the south and south west of the proposed Maxwell Solar Farm.

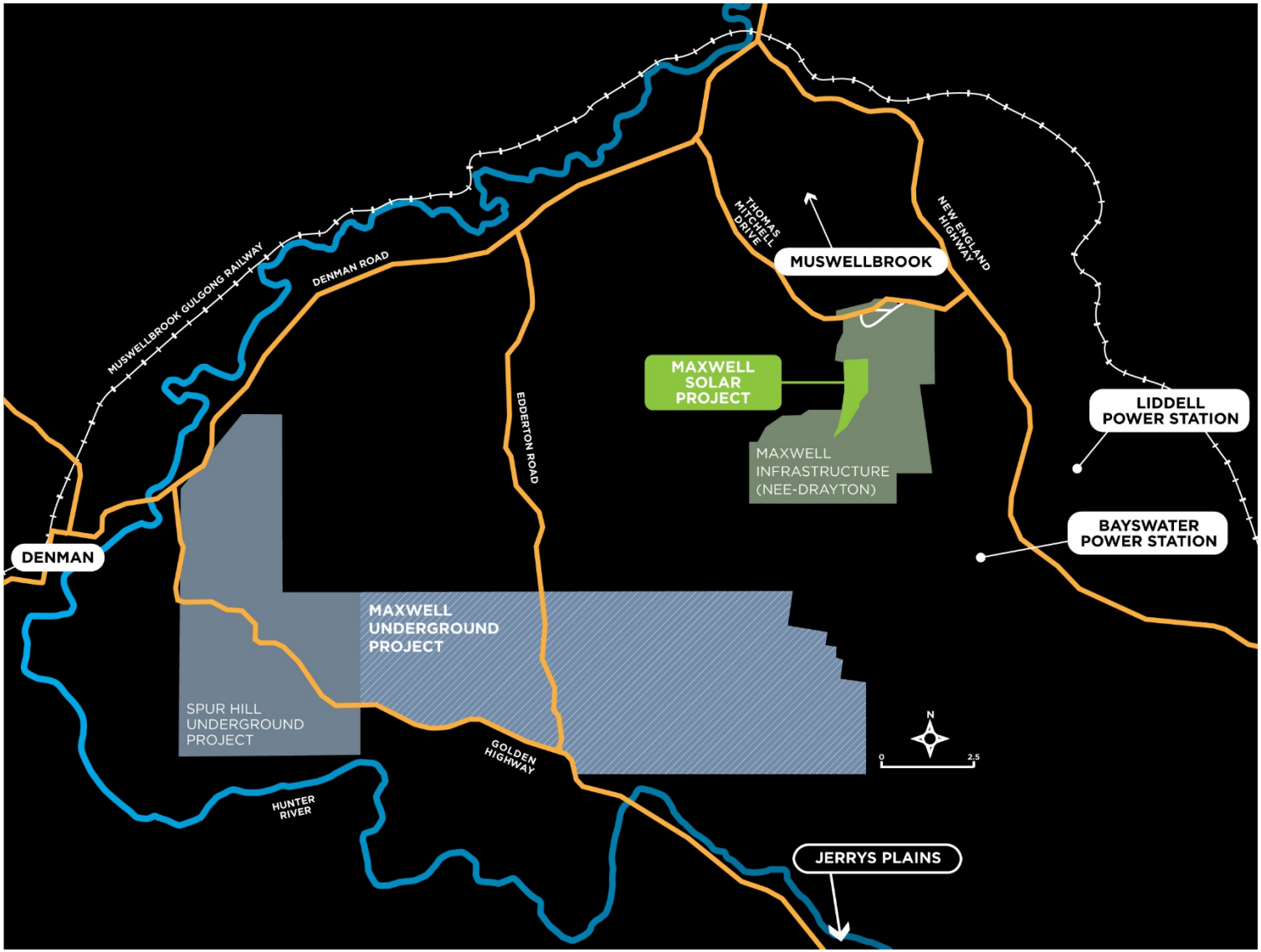

Figure 1-1 Location of Maxwell Solar Project, Maxwell Infrastructure, Spur Hill Underground Project and Maxwell Underground Project

Advice is currently being sought from DP&E on defining an approval pathway for the project while meeting the rehabilitation and other existing obligations for this land. This has included several meetings in person with DP&E and a letter provided to DP&E dated 16 November 2018 addressing requests for further information on the project, followed by an online meeting on 3 December 2018.

It is proposed that the land for the Maxwell Solar Farm be excised or removed from CL 229. The legal mechanism available for this to occur is the lodgement with the DRG of a completed Form AD6 "Application for full or partial cancellation of an authority" under Section 125 of the *Mining Act 1992.*

1.3 THE PROPOSAL

The Maxwell Solar Farm proposal site is located in the locality of Muswellbrook, and is approximately 10km south-south east of Muswellbrook town centre and 35km north west of Singleton, within the Muswellbrook Local Government Area (LGA) (Figure 1-2). The site would be accessed from Thomas Mitchell Drive, which is located on the northern boundary of Maxwell Infrastructure. The proposed Maxwell Solar Farm will study and confirm in the EIS one of two alternate connections to the Ausgrid network.

Option A is to connect to an existing 33kV substation located on the Maxwell Infrastructure Site. Connection would be via a proposed powerline corridor linking the substation to the proposed Maxwell Solar Farm. Option B is to connect to the network via a new 66kV switchyard, through the Mt Arthur feeder, which is currently under construction. This installation will also appear in the Maxwell Underground Development Application as the power supply to the Maxwell Underground.

Both options for power supply are depicted in Figure 1-3 below.

Figure 1-2 Regional locality

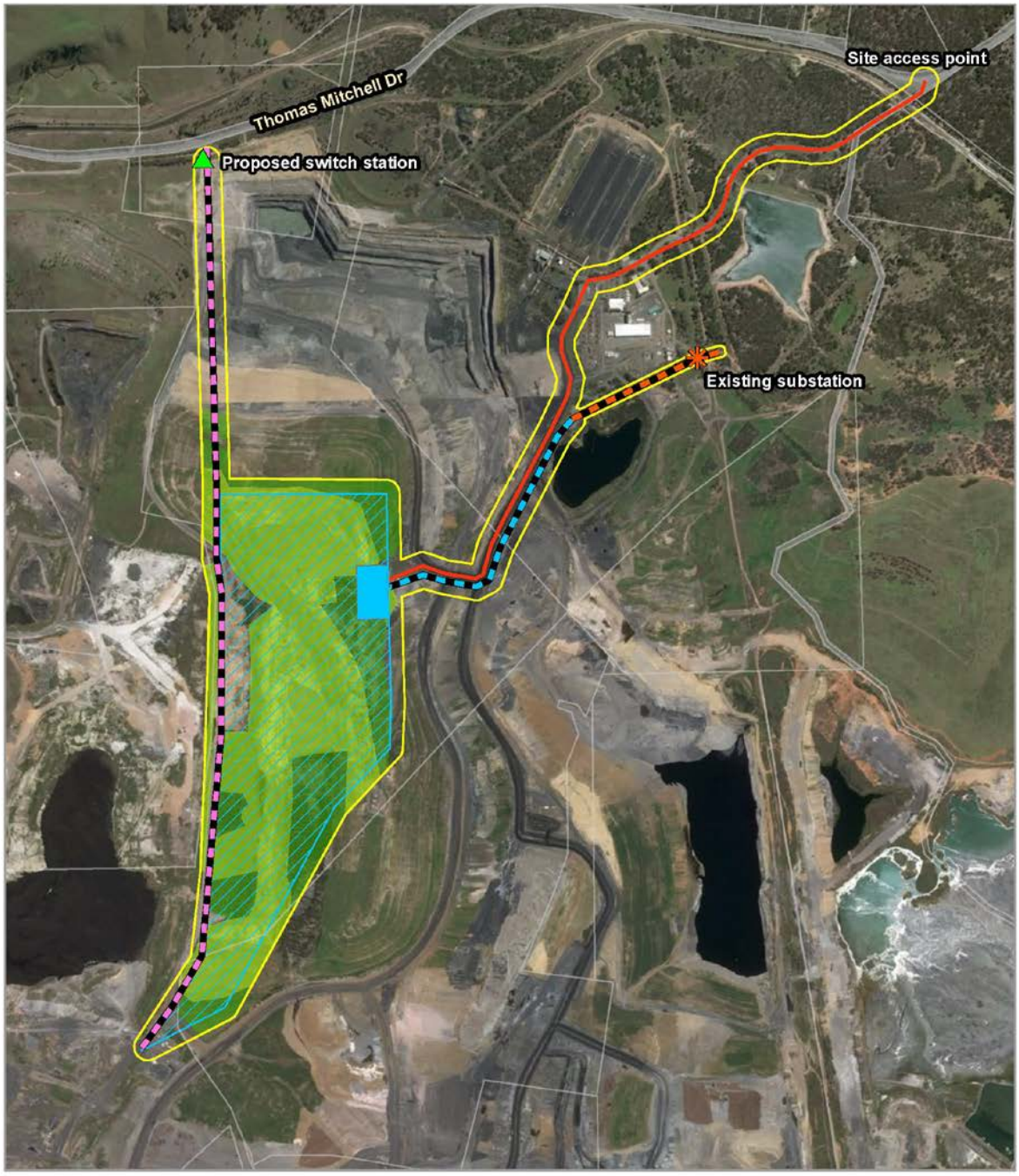

Figure 1-3 Project layout and constraints

1.3.1 Site description

The existing Maxwell Infrastructure Approval encompasses 1470 ha of which approximately 105 ha would be developed as the Maxwell Solar Farm (the proposal site), identified as within the following properties:

- Lot 6, DP701496
- Lot 14, DP701496
- Lot 21, DP545087
- Lot 64, DP850818.

The proposed location for the Maxwell Solar Farm was disturbed during open cut mining operations and currently under rehabilitation. There are existing Maxwell managed internal roads on site that provide access around the mine. Access to the site is via Thomas Mitchell Drive. To the east of the proposal site there are existing Ausgrid 33 kilovolt (kV) powerlines and a substation, which are privately owned and maintained as part of the existing site, as shown Figure 1-3.

Photographs of the site are provided in Appendix A.

There are 33 residences within three kilometres of the project boundary, as shown in Figure 1-4 below.

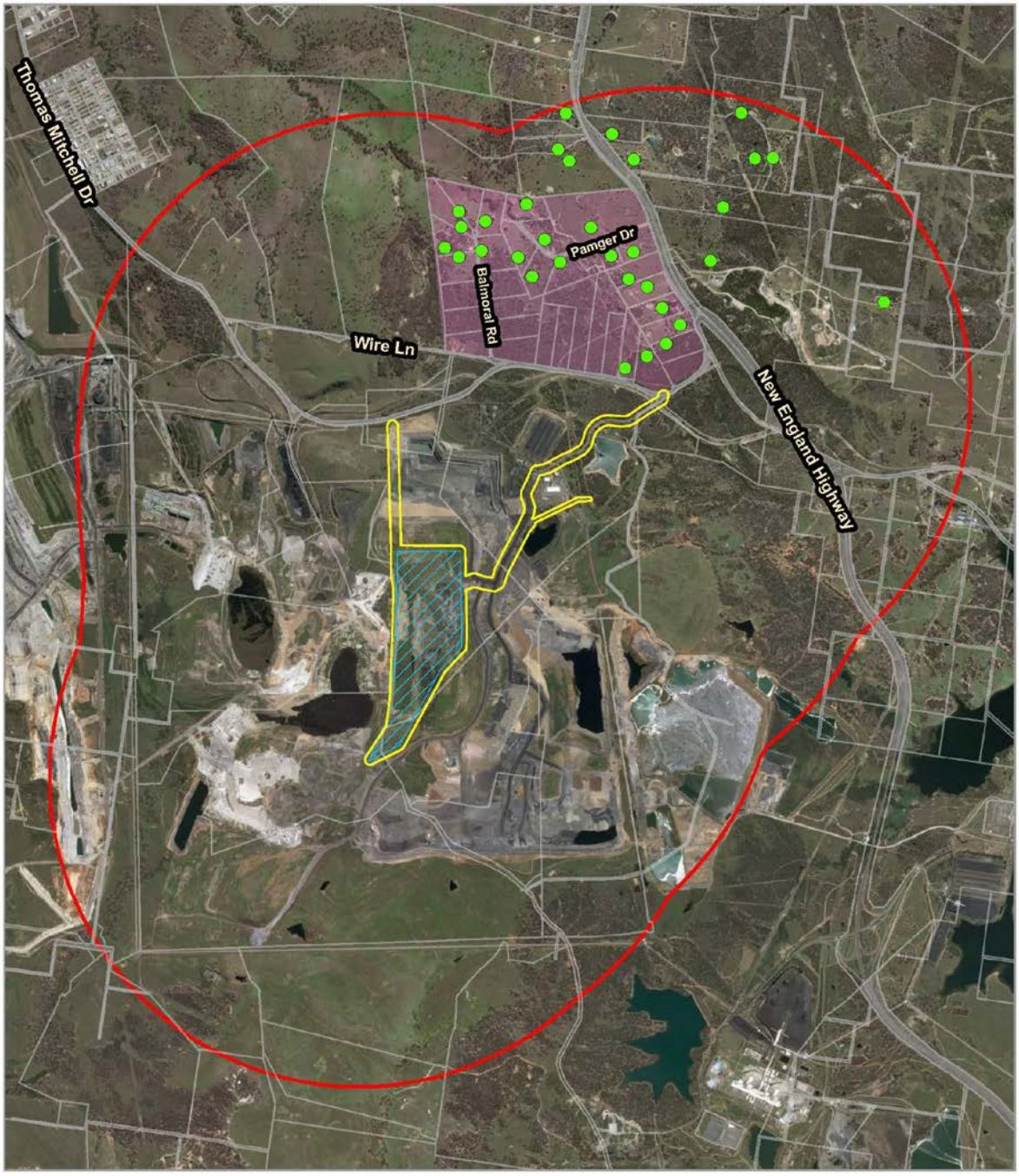

Figure 1-4 Residences within 3km of the project boundary, including both the 33kV and 66kV powerline options

1.3.2 Proposal description

The Maxwell Solar Farm would comprise the installation of a solar plant with a capacity of approximately 25 megawatts (MW) that would supply electricity to the Maxwell Infrastructure site and/or the Maxwell Underground site and/or the National Energy Market (NEM). Existing viable revegetated areas that occur on the array site would be retained where possible and tree clearing would be minimised through optimising the layout. An indicative Maxwell Solar Farm extent is illustrated in Figure 1-3. A more precise development area and layout would be informed by the detailed site investigations assessment, planning and design stage.

The proposal would include the following elements:

1. Flat plate photovoltaic (PV) modules in a fixed or tracking arrangement
2. Potential battery storage, estimated to be around 10 per cent of production, ie. 2.5MWh
3. Overhead line, overhead collection line or underground line from the proposed array to the existing Ausgrid 33kV powerlines to the east or to the 66kV powerlines to the north with a Switch Station at the northern end of the 66KV powerline.

Construction of the proposed development is expected to take 18 months if constructed in one stage; construction may be staged and therefore take longer than 18 months. The Maxwell Solar Farm is expected to operate for more than 25 years. The Maxwell Solar Farm would be decommissioned at the end of its operational life, removing all above ground infrastructure and then rehabilitating the site to a safe, stable and non-polluting landform.

A prefeasibility study developed an estimate of costs for the project. With the terrain and connection costs for the project, the cost for the solar farm is expected to be around $37 million.

2 ALTERNATIVES AND JUSTIFICATION

2.1 ALTERNATIVES CONSIDERED

During the site selection process for the proposed Maxwell Solar Farm, a number of alternative locations were considered. The site was initially chosen due to the close proximity to the substation and electricity infrastructure while avoiding impacting the future operation of a proposed transport corridor to the Maxwell Underground Project (which is located around 8 km to the south-west (see Figure 1-1). Minimising environmental and social impacts and maximising efficiency were major considerations in the evaluation of alternatives within the site. Environmental constraints were investigated (Appendix B) to assist with determining the preferred layout for the proposal. Along with environmental impact minimisation, the site area proposed for the location of the Maxwell Solar Farm on the Maxwell Infrastructure site was selected given it balanced a number of factors as outlined below:

1. Availability of a solar resource
2. Proximity to an existing electricity transmission network with good connection capacity
3. Availability of suitable land without impacting a proposed transport corridor to the Maxwell Underground Project
4. Suitability of the land in terms of factors that affect solar yield and construction costs (northerly aspect, low relief topography, major transmission corridor)
5. Suitability of the land in terms of environmental factors that constrain development (minimal native vegetation removal required, previously disturbed site, no previously identified heritage or other social values)
6. Single landowner.

Maxwell would finalise the infrastructure layout for the solar proposal once environmental constraints have been fully investigated through the EIS process. The proposal components are flexible providing for a number of alternative layout arrangements. The final layout would aim to balance solar yield and construction costs factors with environmental considerations. The EIS would include details on the evolution of the final layout, with regard to these factors.

2.2 STRATEGIC JUSTIFICATION

2.2.1 Climate change

The proposal would contribute to the NSW Renewable Energy Action Plan (NSW Trade and Investment, 2013), which supports the national target of 20 per cent (%) renewable energy by 2020. The proposal would also further the three goals of the Action Plan:

1. Attract renewable energy investment and projects;
2. Build community support for renewable energy; and
3. Attract and grow expertise in renewable energy.

The NSW 2021: A plan to Make NSW Number One (Department of Premier and Cabinet, 2011) has the following goal:

- *Contribute to the national renewable energy target … by promoting energy security through a more diverse energy mix, reducing coal dependence, increasing energy efficiency and moving to lower emission energy sources.*

The proposal would also contribute to the Commonwealth Government's objective to achieve an additional 33 gigawatt (GW) of electricity from renewable sources by 2020 under the Renewable Energy Target (RET).

The COP21, also known as the 2015 Paris Climate Conference, achieved a legally binding and universal agreement on climate, with the aim of keeping global warming below 2°C, chiefly by reducing greenhouse gas emissions. The proposal would form part of the Australian effort to help meet this target.

2.2.2 Electricity supply

Australian Energy Market Operator (AEMO) Integrated System Plan (2018) forecasts that grid-supplied electricity consumption will remain flat for the next ~20 years, despite economic and population growth. The overall need for power from the grid, will remain static due to counterbalancing impacts of distributed energy at consumers' locations. The electricity network was designed to deal with a small number of very large power generating stations. The localisation of power generation helps the grid to cope with supply from diversified renewable energy projects.

2.2.3 Socio-economic benefits

Employment

The proposal would generate around 50 direct jobs during construction and indirect supply chain jobs. In addition, it would employ a small number of staff including service contractors during the operation and maintenance phase (expected to be approximately 25 years).

The employment benefits extend through the local supply chains to fuel supply, vehicle servicing, uniform suppliers, motels, B&B's, cafés, hotels, catering and cleaning companies, tradespersons, tool and equipment suppliers and many other businesses. In 2016/17, 14,820 Australians were directly employed in the renewable energy sector an increase of 3,680 jobs from the previous year (2015- 2016) (Australian Bureau of Statistics, 2016).

Economic Diversification

The proposal would diversify the use of land in the Muswellbrook local government area. The proposal would add to the current land uses and provide business in the broader area with an additional source of income and economic activity.

3 CONSULTATION

Community and stakeholder consultation is integral to the proposal. In 2017, DP&E updated their guidelines for community and stakeholder engagement which describe how expectations for engagement have increased and stressing the importance of early engagement during the scoping phase. Maxwell is committed to engaging with the local community and ensuring that information is widely available for the proposed Maxwell Solar Farm.

A Community Consultation Strategy (CCS) has been prepared to provide a framework to further engage with the community and stakeholders about the proposal and to provide opportunities to offer input into the assessment and development process. Stakeholders have been identified as those potentially being impacted by the proposal or having an interest in the project. The plan going forward is to continue to engage with the following groups:

Table 3-1 Community and stakeholders

Stakeholder group	Defining characteristics
1. Adjacent and near neighbours	Residents of the Antiene Subdivision north of the proposal site
2. Adjacent Businesses including mines	Hunter Valley Energy Coal Pty Ltd operates the Mt Arthur Mine to the West and AGL Ltd operates Liddell power station to the East.
3. Local Businesses	No local businesses are located within 3 km of the site. There are maintenance facilities, a takeaway shop and industrial offices located approximately 5 km north west of site along Thomas Mitchell Drive.
4. Representative bodies	Representatives of groups such as: • The Maxwell Infrastructure and Spur Hill Community Consultative Committees (CCCs) • Muswellbrook Shire Council • Local state and national Members of Parliament
5. Media	Outlets to ensure a clear message is delivered, like local radio, television, newspapers, project website.
6. Broader community	The project is likely to be of interest to the broader local and regional community.
7. Aboriginal Stakeholders	The project is of interest to Registered Aboriginal Parties within the region.

Consultation to date

Consultation to date has included meetings with NSW Department of Planning and Environment and press releases to local and other members of parliament, Muswellbrook Shire Mayor, Singleton Council and local media outlets.

The Community Consultative Committee (CCC) for the Maxwell site, the CCC for the neighbouring Spur Hill Underground Coal Project, and the community more broadly, have already been consulted on the proposal

and have indicated their support. Issues raised have focussed on whether the solar farm would be visible, with discussion on potential for noise impacts during construction.

Two community Information sessions were held on 21 and 22 November 2018 for both the Maxwell underground project and the Maxwell Solar farm. Forty-eight community members completed their details on the attendance sheet at the information sessions. A manned stall with information and pictures was dedicated to the Maxwell Solar Farm. Questions about the solar farm were general in nature and inquisitive, including its location and size. No issues or objections were raised with the proposal. No comments were left regarding the solar farm in the attendance sheet.

Consultation with residents located within the Antiene subdivision to the north of the proposal site will continue, as outlined in the Maxwell Solar Project Community Consultation Strategy (2018). Four residents of the Antiene area are members of the CCC for the Maxwell site and have been directly consulted through that process. Residents were invited to the community consultation sessions, with none of those residents choosing to attend. Residents of Antiene have also received two Maxwell community newsletters with information on the Maxwell Solar Farm. All residents will be consulted directly and during the preparation of the EIS.

4 PLANNING CONTEXT

4.1 NSW LEGISLATION

4.1.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) and its associated regulations and instruments set the framework for development assessment in NSW. The proposal would be assessed under Division 4.1, previously Part 4, of the EP&A Act.

4.1.2 State Environmental Planning Policy (State and Regional Development) 2011

Clause 20 of Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011* defines 'State Significant Development' as including:

Development for electricity generating works or heat or their co-generation (using any energy source, including gas, coal, biofuel, distillate, waste, hydro, wave, solar or wind power) that has a:

(a) Capital investment value of more than $30 million, or

(b) Capital investment value of more than $10 million and is in an environmentally sensitive area of State significance.'

The proposal would have an estimated capital investment cost of $37 million. This estimate is based on a prefeasibility study by Maxwell; it is noted that the costing includes terrain and connection costs and an allowance for the complexities of the construction on an existing operational mine site. The proposal is therefore classified as 'State Significant Development' under Division 4.1 of the EP&A Act.

State Significant Developments (SSD) are major projects which require approval from the Minister for Planning and Environment. While the Minister for Planning and Environment is the consent authority for

SSD, the Minister may delegate the consent authority function to the Independent Planning Commission (IPC), the Secretary or to any other public authority.

An Environment Impact Statement (EIS) is prepared in accordance with environmental assessment requirements issued by the Secretary of the Department of Planning and Environment (SEARs). In determining the SEARs, the Secretary must consult with relevant public authorities and would have regard to the need to assess key issues raised by those public authorities. A scoping report is required to be submitted with the request for the SEARs.

4.1.3 State Environmental Planning Policy (Infrastructure) 2007

Clause 34(7) of *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) provides that development for a 'solar energy system' may be carried out by any person with consent on any land (except land in a prescribed residential zone). A solar energy system includes a Photovoltaics (PV) Electricity Generating System. The proposal is therefore permissible with consent on any land, except land in a prescribed residential zone.

4.1.4 Roads Act 1993

The *Roads Act 1993* (Roads Act) provides for the classification of roads and for the declaration of the Roads and Maritime Services (RMS) and other public authorities as roads authorities for both classified and unclassified roads. It also regulates the carrying out of various activities in, on and over public roads. The need for upgrade works on local roads would be considered as part of the traffic assessment conducted for the proposal. If required, approval from the roads authority (RMS and/or Council) would be sought under section 138 of the Roads Act. Muswellbrook Shire Council, and RMS if required, would be consulted during the design and preparation of the EIS.

4.1.5 Biodiversity Conservation Act 2016

The NSW government introduced new biodiversity legislation for the consideration and assessment of biodiversity impacts. The *Biodiversity Conservation Act 2016* (BC Act) and *Local Land Services Act 2013* (LLS Act) commenced on the 25th August 2017 and has replaced the *Threatened Species Conservation Act 1995*.

The proposal would require assessment under Section 7.9 of the BC Act. A preliminary assessment of potential impacts has been conducted in Section 5 of this report.

4.1.6 National Parks and Wildlife Act 1974

Under the *National Parks and Wildlife Act 1974*, the Director-General of the National Parks and Wildlife Service is responsible for the care, control and management of all national parks, historic sites, nature reserves, Aboriginal areas and state game reserves. The Director-General is also responsible under this legislation for the protection and care of native fauna and flora, and Aboriginal places and objects throughout NSW. Under Section 89J of the EP&A Act, an Aboriginal Heritage Impact Permit under Section 90 of the *National Parks and Wildlife Act 1974* would not be required for a State Significant Development. The potential impacts to Aboriginal heritage and native fauna and flora are discussed in Section 5 of this report.

4.1.7 Heritage Act 1977

This Act aims to conserve heritage values. The Act defines 'environmental heritage' as those places, buildings, works, relics, moveable objects and precincts listed in the Local or State Heritage Significance. Heritage items are listed in the environmental heritage schedule of the local Council's Local Environmental Plan or listed on the State Heritage Register, a register of places and items of particular importance to the people of NSW. Under Section 89J of the EP&A Act, an approval under Part 4 or a permit under Section 139 of the *Heritage Act 1977* would not be required for a State Significant Development. The proposal is unlikely to directly or indirectly affect any items of heritage significance (refer to Section 5).

4.1.8 Crown Lands Act 1989

The objects of this Act are to ensure that Crown land is managed for the benefit of the people of New South Wales. Under Part 3 of the Act, the Minister for Lands must be satisfied that the land has been assessed prior to any allocation action, i.e. reservation, dedication, sale, lease, licence or permit. The purpose of a land assessment is to ensure decisions made in relation to Crown land are in accordance with the principles of Crown land management by (amongst other matters) including an assessment of the capabilities of Crown land and the identification of suitable land uses.

Preliminary searches do not indicate Crown land to be present within the proposed Maxwell Solar Farm site. This would be further investigated in the EIS and the Department of Industries (Lands) would be consulted during the assessment process.

4.2 LOCAL GOVERNMENT

4.2.1 Muswellbrook Local Environmental Plan 2009

The site is located within the Muswellbrook Local Government Area and is therefore subject to the provisions of the *Muswellbrook Local Environmental Plan 2009* (the LEP). The proposed Maxwell Solar Farm site is located on land zoned Primary Production (RU1). While a PV electricity generating system is not permissible in this zone, the provisions of the ISEPP override the LEP and it is permissible on the land with consent, as discussed in Section 4.1.3..

No subdivision would be required for the development. The existing substation, proposed switchyard (as part of the 66kV, if required), existing and proposed extension of the 33kV powerline and proposed 66kV powerline, would all be located within the subject land, which would continue to be privately owned and maintained. The electricity works would be ancillary to the solar farm development and would be covered under ISEPP, as discussed above.

Land Use Zone Objectives

The LEP states that the consent authority must have regard to the objectives for development in a zone when determining a development application. The objectives of the RU1 zone are to:

- To encourage sustainable primary production by maintaining and enhancing the natural resource base
- To encourage diversity on primary industry enterprises and systems appropriate for the area
- To minimise the fragmentation and alienation of resource lands

- To minimise conflict between land uses within this zone and land uses within adjoining zones
- To protect the agricultural potential of rural land not identified for alternative land use, and to minimise the cost to the community of providing, extending and maintaining public amenities and services
- To maintain the rural landscape character of the land in the long term
- To ensure that development for the purpose of extractive industries, underground mines (other than surface works associated with underground mines) or open cut mines (other than open cut mines from the surface of the flood plain), will not:
    a. Destroy or impair the agricultural production potential of the land or, in the case of underground mining, unreasonably restrict or otherwise affect any other development on the surface, or
    b. Detrimentally affect in any way the quantity, flow and quality of water in either subterranean or surface water systems, or
    c. Visually intrude into its surroundings, except by way of suitable screening.
- To protect or conserve (or both):
    a. Soil stability by controlling development in accordance with land capability, and
    b. Trees and other vegetation, and
    c. Water resources, water quality and wetland areas, and their catchments and buffer areas, and
    d. Valuable deposits of minerals and extractive materials by restricting development that would compromise the efficient extraction of those deposits.

4.3 COMMONWEALTH LEGISLATION

4.3.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act provides an assessment and approval process for actions likely to cause a significant impact on Matters of National Environmental Significance (MNES). These include:

- World Heritage properties
- National Heritage places
- Wetlands of international importance (listed under the Ramsar Convention)
- Listed threatened species and ecological communities
- Migratory species protected under international agreements
- Nuclear actions (including uranium mines)
- Commonwealth marine areas
- The Great Barrier Reef Marine Park
- A water resource, in relation to coal seam gas development and large coal mining development.

Approval by the Commonwealth Environment Minister is required if an action is likely to have a significant impact on a MNES. Assessments of significance based on criteria listed in Significant Impact Guidelines 1.1

issued by the Commonwealth (Commonwealth of Australia 2013) are used to determine whether the proposed action is likely to have a significant impact (i.e. is likely to be considered a 'controlled action').

A search of the Commonwealth Protected Matters Search Tool (5-kilometre buffer, undertaken on 17 September 2018) indicated four threatened ecological communities, 25 threatened species and 14 migratory species within the search area. The search also indicated 1 wetland of international importance located greater than 50km upstream.

A summary of the EPBC Act search report is provided in Appendix C.

Surveys to determine the presence and likelihood of impact to these entities have already been undertaken; as summary of findings is provided in section 5.2.1.

5 PRELIMINARY ENVIRONMENTAL ASSESSMENT

5.1 METHODOLOGY

A preliminary environmental risk analysis has been conducted to assist in the identification of key environmental matters that would require detailed assessment within the EIS. Risks were identified for both the construction and operation phase of the proposal and analysed in relation to their possible consequence and likelihood of occurrence. From this analysis, some environmental matters were deemed to be key issues on the basis that they had the potential, without appropriate mitigation measures, to have a significant impact on the environment.

A summary of the key environmental issues is provided in Section 5.2. The intent of the discussion is to demonstrate an understanding of the issues that require further environmental assessment and likely mitigation measures for these key issues. The potential impacts and management of other (less significant) issues are discussed in Section 5.3.

The following environmental risks are considered to be key aspects:

- Biodiversity;
- Visual amenity;
- Aboriginal heritage;
- Land use and resources; and
- Noise (during construction).

5.2 ASSESSMENT OF KEY ENVIRONMENTAL MATTERS

5.2.1 Biodiversity

Overview

The potential ecological constraints within the study area have been identified based on the following information sources:

- Existing threatened species listings under the BC Act and EPBC Act
- Existing records of threatened species sightings in the study area, as recorded in the Bionet Database (OEH)
- Department of Environment & Energy Protected Matters Search Tool (nationally threatened species listed on the EPBC Act)
- Site survey by a qualified NGH Environmental ecologist.

Database searches

A search of the EPBC Act Protected Matters Search was conducted on 18 September 2018, using a 10km by 10km grid over the proposal site. This search identified 29 threatened species, 4 endangered ecological communities (EECs) and 14 listed migratory species (some of which are included within the threatened bird species) that are either known to occur of have the potential to occur in this area.

A search of the NSW Bionet was conducted on the same date, the search was conducted for the Muswellbrook LGA. The results were then clipped using a 10km buffer of the site. This search identifies species listed under the BC Act. The search identified 29 threatened fauna species (16 birds and 13

mammals) and five threatened flora species within 10km. One threatened species, the Eastern Bentwing-bat, has been recorded foraging within the proposal site in 2016.

A search of the Department of Primary Industries (DPI) WeedWise database identified approximately 150 priority weeds for the Muswellbrook LGA.

Site inspection

The proposed Maxwell Solar Farm is to be located on approximately 105ha of mine rehabilitation. This area was previously an open cut mine to a depth of greater than 80 metres. The open cut has since been re-filled with rock, profiled, and rehabilitated with topsoil and seeded. A field survey was undertaken by an NGH Environmental Ecologist on 31 August 2017 which included the identification of potential biodiversity constraints and vegetation mapping within the proposal site. Rapid assessment survey was undertaken to classify potential Plant Community Types (PCT), however PCTs could not be determined based on the lack of diagnostic floristic species within exotic dominated and rehabilitated overburden. Further preliminary vegetation surveys were undertaken by Colin Driscoll from Hunter Eco on 26 and 27 September 2018 (Appendix D). These surveys were via rapid assessment with no floristic plot data gathered. Table 5-1 shows the areas of vegetation within the proposed Maxwell Solar Farm boundary.

Table 5-1 Vegetation within the solar farm boundary (Source: Hunter Eco, 2018)

Vegetation	Area (ha)
Woodland	21
Pasture	67
Not rehabilitated	17

Vegetation on site primarily consists of rehabilitated pasture including exotic groundcover such as Kikuyu (*Pennisetum clandestinum*) and Rhodes grass (*Chloris gayana*) with occasional derived/regenerating native species i.e. *Acacia* species. Rehabilitated woodland areas have been planted and consist of *Eucalypt* species, primarily those not native to NSW (i.e. Eucalyptus *cladocalyx)*. The potential north battery location and storage contains components of native over-storey and mid storey species. There were no threatened species observed and habitat for threatened species is regarded minimal considering the previous disturbance history and land use of the site, however, may be used on occasion for foraging by transient and more mobile species.

Rehabilitated woodland areas contained were fragmented and consisted of a low juvenile canopy of primarily of Sugar Gum (*E. cladocalyx*), a mid layer of *Acacia* species, and scattered exotic grass species and herbs. Pasture in one continuous area was dominated by Rhodes Grass (*Chloris gayana*) and Kikuyu (*Cenchrus cladestinus*) mixed with several weeds such as Galenia (*Galenia pubescens*) and Onion Weed (*Asphodelus fistulosus*).

The vegetation across the proposed Maxwell Solar Farm area is primarily exotic and does not represent any plant community type (PCT) listed in the NSW Vegetation information System (VIS) database. The NSW Biodiversity Assessment Method (BAM) specifically excludes the use of the credit calculator for assessing vegetation integrity of non-natural vegetation.

Potential impacts

The following impacts upon biodiversity have been considered as having potential to occur during the construction and operation of the proposal:

- Clearing, removal and disturbance of vegetation including rehabilitated sites

- Clearing of limited habitat (including disturbance to potential foraging, sheltering and breeding habitat)
- Loss of connectivity and nesting sites
- Introduction and spread of invasive species and weeds
- Increase risk of competition with regenerating native plants
- Disturbance or displacement of fauna
- Microclimate impacts due to shading, water availability, temperature etc
- Movement barrier and collision hazard by perimeter fencing.

Despite the Maxwell Solar Farm vegetation being predominantly exotic it does have the potential to provide habitat for threatened fauna species, in particular woodland birds and raptors. The pasture and woodland could provide foraging habitat for the Square-tailed Kite (recorded nearby) or Little Eagle, and the woodland could provide habitat for small woodland birds such as Diamond Firetail, Hooded Robin, Scarlet Robin or Flame Robin.

Further assessment

SSD projects have a mandatory component that a Biodiversity Development Assessment Report (BDAR) be undertaken. However, as a PCT cannot be determined and therefore the BAM calculator cannot be utilised, as well as the project being unlikely to have a significant impact on native vegetation and/or threatened species habitat or communities, the proponent will be seeking a waiver from the Secretary of OEH for the need to undertake a BDAR for this project, and instead prepare a Biodiversity Assessment to support the EIS. The application for the waiver will be submitted following receipt of SEARs from the Department, as recommended by OEH in recent consultation with OEH staff from the Newcastle office.

As part of the EIS, the detailed ecological surveys and further investigation and assessment will be undertaken in the format of a general flora and fauna assessment and would include any Tests of Significance, if required. If any significant impacts are identified for the project (highly unlikely), then a BDAR would be prepared.

5.2.2 Visual amenity

Overview

The proposal site is located within the Muswellbrook locality with the proposed Maxwell Solar Farm site located within a mining and agricultural region surrounded by heavy industrial and mining purposes. Areas of the proposal are typically hidden by the undulating topography of the land which currently provides screening to old mine workings. However, at a limited number of locations where intervening hills do not screen the proposed Maxwell Solar Farm, there are glimpses of the site.

Forested areas to the north of Thomas Mitchell Drive provide important screening to the rural residential areas to the north and east of the proposal site. Some woodland/open forest areas south of Thomas Mitchell Drive and in the north eastern site boundary also provide screening to operational areas.

A combination of gentle topography and a minor spur immediately to the north west of the proposal site provide screening to most areas in the west. The exception is the elevated area adjacent to Roxburgh Road. However, this viewing zone is over 10 km away and the proposal would be seen in the context of the surrounding and existing land use.

The south of the proposed Maxwell Solar Farm includes the sensitive vineyard and horse stud areas in the vicinity of Saddler's Creek. These areas are screened from the proposed Maxwell Solar Farm by spurs radiating from Mount Arthur and the viewing zoning is over 10 km from the proposal site.

Further assessment

Visual amenity for any development is a concern for residents in the LGA. There are limited views of the proposed Maxwell Solar Farm due to the amount of screening by vegetation and topography.

A visual impact assessment, including viewshed analysis and community consultation input, would be prepared as part of the EIS to investigate visual impacts and mitigation options.

5.2.3 Aboriginal heritage

Extensive searches of the Aboriginal Heritage Information Management System (AHIMS) were produced on 28 November 2018 and 17 December 2018 and identified 753 Aboriginal sites within two kilometres of the proposal area. Of these sites 37 remain valid while 36 of the registered Aboriginal heritage sites have been destroyed or deleted, as outlined in Appendix E and shown in Figure 5-1. Archaeological Risk Assessment Services Pty Ltd (ARAS) was engaged to undertake an Aboriginal Cultural Heritage impact assessment in relation to the Drayton Mine extension project and Anglo Coal have developed a Cultural Heritage Management Plan in consultation with the Registered Aboriginal Parties (RAPs). There were 480 Aboriginal objects located within the study area for the extension of the mine.

The site of the proposed Maxwell Solar Farm, and associated infrastructure would be constructed in areas subject to a high level of modification from past activities including mining operations. Conversely, unmodified areas near waterways and areas located on crests of hills (to the south-east of the study area), where works are not proposed, are likely to have higher potential for significance. Mount Arthur (483 m Australian Height Datum (AHD)) is located to the south-west of Maxwell. Two drainage lines, Ramrod Creek and Bayswater Creek, are mapped within the site but during the site inspection it was evident that no natural drainage lines were present.

Aboriginal consultation

The consultation with Aboriginal stakeholders will be undertaken in accordance with clause *80C of the National Parks and Wildlife Amendment (Aboriginal Objects and Aboriginal Places) Regulation 2010* and OEH's Aboriginal Community Consultation Requirements for Proponents (ACHCRP) 2010 (DECCW 2010a).

A brief summary of the consultation process includes:

1. Initial notification and registration of Aboriginal people who hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places in the study area.
2. Provide Registered Aboriginal Parties (RAPs) with information about the scope of the proposed project and the proposed cultural heritage assessment process.
3. Gather information about cultural significance and visually inspect areas with RAP field representatives.
4. Prepare and finalise a report with input from RAPs.
5. Report finalisation.

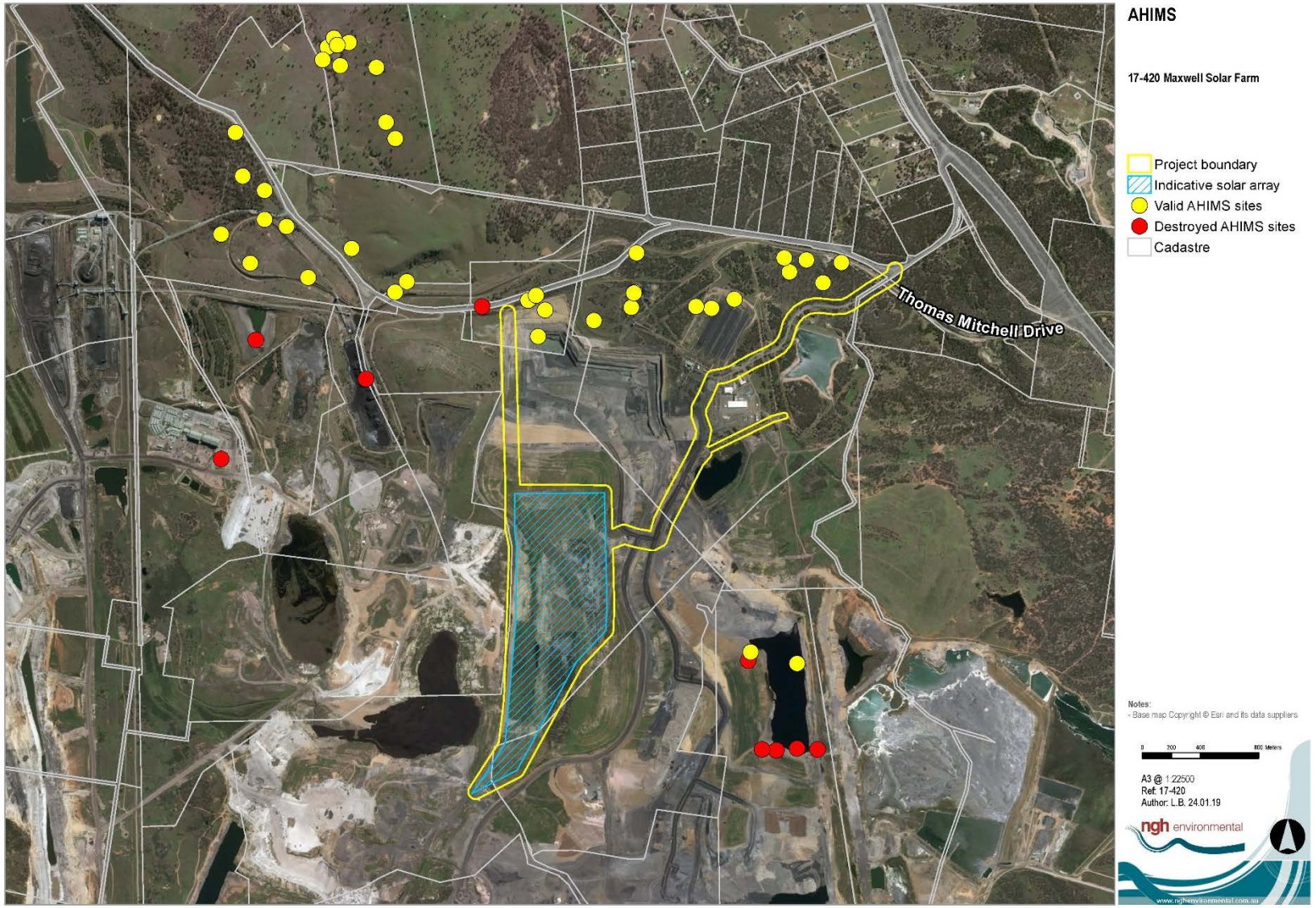

Figure 5-1 Registered AHIMS sites within 1.5km of the proposed Maxwell Solar Farm site

Potential impacts

The following impacts upon Aboriginal heritage have been considered as having potential to occur during the construction of the proposal:

- Uncovering an unexpected or unidentified Aboriginal heritage item.

Further assessment

An Aboriginal Cultural Heritage Assessment (ACHA) of the development footprint and stakeholder consultation process would be completed as part of the EIS. The ACHA will include significance assessments of any Aboriginal heritage sites that may be affected by the proposal, and will be completed in accordance with the frameworks and principals outlined in the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011) and The Burra Charter (Australia ICOMOS, 2013).

5.2.4 Land use and resources

The proposed Maxwell Solar Farm site is located within a mining and agricultural region surrounded by:

- Bayswater Power Station and Liddell Power Station to the southeast and east;
- The Antiene subdivision and grazing agricultural land to the north and northeast; and
- Mt Arthur Coal (MAC) to the west, southwest and northwest.

The Maxwell Solar Farm would be within an existing mining operation, Maxwell Infrastructure, within the rehabilitation zone of the mine.

The town of Muswellbrook is approximately 10 km north of the proposed site. The southernmost residential areas of Muswellbrook are located more than 5 km to the north of the site.

The proposed Maxwell Solar Farm operation is not considered to be incompatible with local land use activities. Construction, particularly the location of site access, should be considered with regard to local houses towards the north.

The Wollemi National Park is approximately 17 km south of the site and is not visible from the site. No formalised amenity areas (such as picnic areas) are located in close proximity of the proposal site.

There are no current exploitation licences relevant to the proposal area as indicated in the MinView database (DPE, 2018). There are current coal titles for the proposal site held by Maxwell Ventures (Management) Pty Ltd.

Potential impacts

The following impacts upon land use and resources have been considered as having potential to occur during the construction or operation of the proposal:

- Change in use of part of the rehabilitation area to Maxwell Solar Farm, which in the long term would be rehabilitated in line with existing rehabilitation obligations
- Relocation of the proposed vegetation corridor (part of the mine approval) further east to allow for the Maxwell Solar Farm development
- Further potential development of Maxwell Infrastructure.

Further assessment

The impact on the change in use of part of the rehabilitation area, land use risk and potential future development of the mine would be assessed in detail in the EIS.

5.2.5 Noise

The site is located south of Thomas Mitchell Drive and west of the New England Highway, approximately 10 km south-east of Muswellbrook. The western boundary of the proposal site adjoins MAC, while the southern and eastern boundaries adjoin AGL's Liddell and Bayswater Power Stations. These adjacent industrial properties to the west, south and east do not contain any noise sensitive receivers. All residences in these directions are sufficiently distant that no noise or vibration impacts are likely to occur.

The Antiene rural residential area exists to the north of the mine and is access from the south via Thomas Mitchell Drive and Balmoral Road and from the north via the New England Highway and Pamger Drive, with Maxwell Infrastructure owning many of the closest residential properties. Closest privately-owned residences are located approximately 1.4 km from the proposed Maxwell Solar Farm site; the residential subdivision as indicated in Figure 1-4, and includes privately-owned residences as well as residences owned by Maxwell Infrastructure and a wildlife refuge.

Potential impacts

Noise impacts would, for the most part, only occur during construction (generated by construction related vehicles and machinery) and are likely to be minor due to the distance and topography of the site. Minimal noise is likely to be generated during operation. Maxwell would adopt mitigation measures during construction, such as daylight only working hours and regular vehicle and machinery maintenance, to reduce the risk of adverse noise impacts.

During the operation of the Maxwell Solar Farm, potential noise impacts are associated with the potential solar tracking system, transformer station and switchgear and any maintenance works undertaken on site. Noise impacts during the operation of the Maxwell Solar Farm are expected to be negligible.

Further assessment

A construction noise assessment will be undertaken as part of the EIS to assess potential noise impacts. The assessment will be undertaken in accordance with the *NSW Interim Construction Noise Guideline* (DECCW, 2009).

5.3 OTHER ENVIRONMENTAL MATTERS

There are a range of potential environmental matters associated with the proposal which are not considered to be key matters. These are considered secondary matters for investigation, given the characteristics of the proposal and the availability of appropriate safeguards for mitigation. These matters are outlined in Table 5-2. The impacts and any required mitigation relating to these matters would be addressed at an appropriate level of detail in the EIS.

Table 5-2 Other environmental matters

Existing environment	Potential impacts	Management and mitigation
Soil and water		
The site is in proximity to four final voids which are used as water storages in the post-mining landscape. First and second order ephemeral creeks drain away from the proposal site and include Ramrod Creek, Saddlers Creek, Bayswater Creek and Saltwater Creek. Lake Liddell to the east and Plashett Reservoir to the south both act as receiving water bodies to surface water and groundwater flow. The site has been disturbed and rehabilitated during mining operations. Excavated topsoil from the mine workings has been stockpiled and used for the rehabilitation. The two main soil landscapes that occur within the proposal site are dark clays and yellow duplex soils and are associated with the Brays Hill Soil Landscape. Most component soils of the Brays Hill Soil Landscape, including the dark clays and yellow duplex soils identified on site, are moderately to strongly structured clays of high fertility.	Construction activities would include minor excavations and vegetation removal which have the potential to cause soil erosion and sedimentation and dust issues.	The design would provide all weather access to the proposal area during construction and operation to avoid erosion/sedimentation impacts and tracking of soil after rain events. The EIS would provide consideration of soil impacts and proposed mitigation measures during construction and operation.
Historic heritage		
A search of the NSW Heritage Register on 31 October 2018 for the Muswellbrook LGA identified 8 listed items under the NSW Heritage Act and 205 items listed under the Muswellbrook LEP and by state agencies. The closest listed heritage items are located at 710 Denman Road, approximately 9 km northwest of the proposed Maxwell Solar Farm site. A search of the Australian Heritage database on the same date and for the Muswellbrook LGA found one commonwealth listed item, Muswellbrook Post Office. This item is located over 9 km north of the proposed Maxwell Solar Farm site. No other listed items were found for the Muswellbrook LGA. The site is highly disturbed from past mining operations and rehabilitation. The land is not identified in Schedule 5 of the Muswellbrook LEP 2009 as an item of Environmental Heritage.	There is a low risk of impact to heritage items.	The heritage status of the proposal area would be assessed during fieldwork undertaken as part of the archaeological assessment. Appropriate management measures would be implemented if required.

Existing environment	Potential impacts	Management and mitigation
Access and traffic		
Access to the site from Thomas Mitchell Drive is via the New England Highway to the east Denman Road to the north west. These roads currently experience moderate to high levels of traffic with speed limits varying from 80 to 100km/h. The Thomas Mitchell Drive/New England Highway intersection is a basic T-intersection with dedicated left turn lanes.	Construction traffic may impact traffic along local roads. Maintenance access tracks during operation would also be required across the proposal area and along the easement of the proposed transmission line.	Construction traffic impacts would be considered in the EIS and take into consideration existing traffic volumes and any requirements from RMS. Consultation would be undertaken before construction with RMS, the local council and road users regarding the works that may affect roads or traffic. The design would also consider any requirements from RMS and other relevant stakeholders on access arrangements to the proposal area, including transmissions line, if any modifications to the current access to the site is required. The level of service associated with both intersections and traffic during construction and operation, in conjunction with the mine's operation, would be subject to further assessment as part of the EIS. A Traffic Management Plan would be developed as part of the CEMP.

Existing environment	Potential impacts	Management and mitigation
Contamination		
A search of the NSW OEH Contaminated Sites Register on 19 September 2018 did not identify any sites within the Muswellbrook LGA. During the site inspection, it was noted that there are areas of potential contamination surrounding the proposal site including diesel storage facilities and refuelling areas as well as magazine (explosive) storage areas.	There is potential that contaminants may be uncovered during excavation activities at the proposal area, or the accidental spill or release of chemicals due to incorrect storage and use.	Risk associated with contamination at the proposal area are considered low and therefore no detailed investigation is likely to be required within the EIS. The mitigation measures would require a CEMP be prepared to manage any contamination identified or created during construction.
Air quality		
The air quality in the study area is expected to be moderate and typical of an industrial and mining area. Sources of air pollution in the area include mining activities, traffic on unsealed roads, local building and construction activities, farming, and animal grazing and to a lesser extent, traffic from the other local roads and other sources such as wood-burning fires.	The construction of the proposal is not anticipated to have a significant impact on air quality and would mostly be related to dust during dry periods and vegetation removal. Impacts to air quality during operation would be negligible due to the expected standard of vehicles and maintenance, and lack of sensitive receptors.	The mitigation measures would require a CEMP be prepared to manage air quality impacts during the construction phase. There is an opportunity to improve local air quality by maintaining ground cover vegetation under the panels.
Hazard and risk		
The proposal area has been predominantly cleared for mining uses, and areas are identified as fire prone under the Muswellbrook LEP.	The proposal is unlikely to be affected by bushfire, or pose a significant bushfire risk. Battery storage on site can present a risk, as defined under SEPP 33.	Bushfire impacts and risks relating to Battery storage would be assessed in the EIS.
Social and economic impacts		
The proposal area is located within the Muswellbrook LGA. In 2016 Muswellbrook LGA had a population of 16,086. The main classes of employment in 2016 were technicians, trades and machinery operators and drivers.	The proposal would generate economic benefits during construction and operation. Other socio-economic impacts would include traffic and access, noise, air quality	The EIS would assess potential social and economic impacts of the proposal.

Existing environment	Potential impacts	Management and mitigation
	and visual impacts. Solar farms also pay higher local council rates than farm land, providing an additional economic benefit.	
Workforce accommodation would be required for potentially 100 staff members during peak construction periods with an average of 50 staff over the construction period. A large majority of these may already reside locally. For visiting workers, accommodation can be sought from Muswellbrook or other towns within a 50 km radius, including Scone, Singleton and Denman.	The proposal would generate economic benefits during construction, bringing business to hotel and motels for long-term accommodation. Accommodation demand may in the short term, during construction, displace tourism for the region.	The EIS would assess potential social and economic impacts of the proposal.
Utilities		
Electricity network TransGrid manages and operates the high voltage electricity transmission network in NSW, and have restrictions on development within powerline easements. TransGrid guidelines state that activities and encroachments are prohibited within a transmission line easement, including 'the installation of fixed plant or equipment', and 'the placing of obstructions within 20 metres of any part of a transmission line structure or supporting guy wire'.	The proposed works would involve works adjacent to these utilities. The Maxwell Solar Farm would need to connect to the AusGrid electricity network.	The EIS would assess the proposal against the setback and approval requirements of TransGrid. The Maxwell Solar Farm would be designed to comply with required setback, approval and consultation requirements of TransGrid. Consultation with TransGrid has already commenced.
Waste management		
The proposal would generate several waste streams and utilise a variety of materials during the construction phase.	During construction, excavated material and green waste would be generated as waste. Packaging from panels and other components would require disposal. Limited operational waste would be associated with the proposal.	A Waste Management Plan would be incorporated into the CEMP, applying the principles to avoid, re-use and recycle to minimise wastes.
Cumulative Impacts		
	In the future there may be further mining works on site and further rural/residential	Early consultation with the community regarding cumulative impacts will be

Existing environment	Potential impacts	Management and mitigation
	development in the surrounding area, however, no approval has been sought for these at this stage. Key cumulative impacts during construction may include traffic, stress on local business for supply and demand (in particular staff accommodation), noise and air quality impacts and waste, as the existing mining operations occur concurrently with the construction of the proposed Maxwell Solar Farm. Key cumulative impacts during operation may include traffic impacts, availability of land.	conducted. Further assessment/investigation of cumulative impacts will be required, and the EIS would assess potential impact and risk

6 CONCLUSION

This Scoping Report has outlined the proposal and established the environmental and planning context of the proposal. The proposal would be assessed under Division 4.1, previously Part 4, of the EP&A Act and classed as State Significant Development under *State Environmental Planning Policy (State and Regional Development) 2011.*

The report has been prepared to assist the development of Secretary's Environmental Assessment Requirements (SEARs) for the proposal, which will guide the preparation of the Environmental Impact Statement (EIS).

The report identifies the following key environmental aspects associated with the proposal, based on preliminary investigations:

- Biodiversity
- Visual amenity
- Aboriginal heritage
- Land use and resources
- Noise (construction).

These matters will be assessed in detail in the EIS. It is likely that other matters such as soil and water values, traffic impacts and natural hazards can be readily addressed by appropriate standard mitigation and management measures. The relevance and importance of matters would be reviewed throughout the EIS process.

7 REFERENCES

Australia ICOMOS. (2013). *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance.*

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Department of Premier and Cabinet. (2011). *NSW 2021: A plan to make NSW number one.*

DPE. (2018). *MinView Web Map.* NSW Department of Planning and Environment.

EPA. (2000). *NSW Industrial Noise Policy.*

Hansen Bailey. (2011). *East Pit Tailings Emplacement & Explosive Storage Facility Environmental Assessment.*

NSW Government. (2018). *Large-Scale Solar Energy Guideline for State Significant Development.* Sydney: Crown Copyright.

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OEH. (2011). *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW.* Office of Environment and Heritage.

APPENDIX A SITE PHOTOGRAPHS

Plate 1 Spotted Gum-Ironbark-Grey Box woodland in Great North Pit, approximately five years since establishment (Source: Malabar Coal, 2018)

Plate 2 Rip lines in bare areas within the Sugar Gum Woodland (Source: Malabar Coal, 2018)

Plate 3 Rehabilitated land (Source: Malabar Coal, 2018)

APPENDIX B FATAL FLAWS ANALYSIS

newcastle
7/11 union st
newcastle west nsw 2302
t 61 2 4929 2301

sydney
unit 18, level 3
21 mary st
surry hills nsw 2010
t 61 2 8202 8333

bathurst
35 morrisset st
(po box 434)
bathurst nsw 2795
t 61 2 6331 4541

bega
suite 1, 216 carp st
(po box 470)
bega nsw 2550
t 61 2 6492 8333

canberra
unit 17, 27 yallourn st
(po box 62)
fyshwick act 2609
t 61 2 6280 5053
f 61 2 6280 9387

wagga wagga
suite 1, 39 fitzmaurice st
(po box 5464)
wagga wagga nsw 2650
t 61 2 6971 9696
f 61 2 6971 9693

ngh@nghenvironmental.com.au
www.nghenvironmental.com.au

4 October 2017

Matthew Forest
Project Development Manager
Malabar Coal Limited
259 George Street
Sydney NSW 2000

matthew@mforrest.com.au

Dear Matthew,

RE Maxwell Solar Farm – Fatal Flaws Analysis (17-420)

NGH Environmental has undertaken a Fatal Flaws analysis of the Maxwell Solar Farm proposal site (the site). The analysis was undertaken based on desktop review and site surveys, to identify high level constraints and major risks of the project, as well as inform the development of a site layout that reflects the site's constraints. This advice includes:

- Discussion of planning pathways for the project including the proposed boundary realignment
- Potential limitations and risks in relation to existing Drayton Mine Project Approval (Ref: 06_0202)
- Environmental context of the site
- Preliminary constraints analysis

Confirmation of the site layout, allowing sufficient flexibility for all options being considered for infrastructure, is now required for us to complete the scoping study.

Please do not hesitate to contact me should you have any questions on the attached information.

Yours sincerely,

Nick Graham-Higgs
Managing Director
0427 260 819

1 APPROVAL REQUIREMENTS

1.1 EXISTING MINE APPROVAL

The Drayton Mine Extension Project was approved as a Part 3A project in February 2008. Since approval, the site has been subject to modifications, and is now subject to Consolidated Conditions of Approval (CoA's) issued following approval of Modification 2 – Tailings Emplacement and determined on the 17 February 2012.

The mining approval would need to be modified for the solar farm development.

2 ENVIRONMENTAL CONTEXT OF THE SITE

2.1 ABORIGINAL HERITAGE

A search of the Aboriginal Heritage Information Management System (AHIMS) on 12th September 2017 identified 7 Aboriginal sites and no Aboriginal places within 1 km of the proposal site. Archaeological Risk Assessment Services Pty Ltd (ARAS) was engaged to undertake an Aboriginal Cultural Heritage impact assessment in relation to the Drayton Mine extension project, and have developed a Cultural Heritage Management Plan. There were 480 Aboriginal objects located within the study area for the extension area.

It is understood that the site of the proposed solar array, and associated infrastructure would be constructed in areas subject to a high level of modification from past activities including mining operations. Conversely, unmodified areas near waterways and areas located on crests of hills (such as the south-eastern part of the study area), where works are not proposed are likely to have higher potential for significance. Mount Arthur (483 m Australian Height Datum (AHD)) is located to the south-west of Maxwell. Two drainage lines, Ramrod Creek and Bayswater Creek, are mapped within the site but during the site inspection it was evident that no natural drainage lines were evident. Any Aboriginal heritage sites/items/etc. identified would be a moderate to high constraint, requiring impact mitigation.

2.2 HISTORIC HERITAGE

A search of the NSW heritage Register on 12th of September 2017 for the Muswellbrook LGA identified 8 listed items under the NSW Heritage Act and 201 items listed under the Muswellbrook LEP and by state agencies. The closest listed heritage items are located at 710 Denman Road, approximately 9 km northwest of the proposed solar farm site.

A search of the Australian Heritage database on the same date and for the Muswellbrook LGA found one commonwealth listed item, Muswellbrook Post Office. This item is located over 9 km north of the proposed solar farm site. No other listed items were found for the Muswellbrook LGA.

The site is highly disturbed from past mining operations and rehabilitation. The onsite inspection identified a number of old structures that would potentially have historic significance. These include old machinery use for mine workings. These are unlikely to be significant but would investigated in more detail as part of the environmental assessment.

The land is not identified in Schedule 5 of the Muswellbrook LEP 2009 as an item of Environmental Heritage.

2.3 BIODIVERSITY

A search of the OEH Wildlife Atlas database atlas for the proposal site identified twenty (20) Endangered Ecological Communities (EEC), four (4) recorded threatened flora species and twenty-nine (29) recorded threatened fauna species, comprising of fifteen (15) bird species and fourteen (14) mammal species.

An EPBC Protected Matters Search Tool, 10 km buffer of the proposal site, identified four (4) Endangered Ecological Communities, fourteen (14) migratory species and twenty-seven (27) threatened species have potential to occur at the site. The threatened species with potential to occur onsite comprised of:

- 7 flora species
  - *Dichnthium setosum* (Bluegrass)
  - *Eucalyptus glaucina* (Slaty Red Gum)
  - *Euphrasia arguta*
  - *Philotheca ericifolia*
  - *Prasophyllum* sp. *Wybong* (C.Phelps ORG 5269) (A Leek-Orchid)
  - *Pterostylis gibbosa* (Illawarra Greenhood)
  - *Thesium austral* (Austral Toadflax)

- 8 bird species
  - *Anthochaera Phrygia* (Regent Honeyeater)
  - *Botaurus poiciloptilus* (Australasian Bittern)
  - *Calidris ferruginea* (Curlew Sandpiper)
  - *Erythrotriorchis radiates* (Red Goshawk)
  - *Grantiella picta* (Painted Honeyeater)
  - *Lathamus discolour* (Swift Parrot)
  - *Numenius madagascariensis* (Eastern Curlew, Far Eastern Curlew)
  - *Rostratula australis* (Australian Painted Snipe)

- 3 amphibian species
  - *Heleioporus australiacus* (Giant Burrowing Frog)
  - *Litoria aurea* (Green and Golden Bell Frog)
  - *Litoria booroolongensis* (Booroolong Frog)

- 8 mammal species
  - *Chalinolobus dwyeri* (Large-eared Pied Bat)
  - *Dasyurus maculatus maculatus* (Spot-tailed Quoll - SE mainland population)
  - *Nyctophilus corbeni* (Corben's Long-eared Bat)
  - *Petauroides volans* (Greater Glider)
  - *Petrogale penicillate* (Brush-tailed Rock-wallaby)
  - *Phascolarctos cinereus* (Koala – combined population of QLD, NSW and the ACT)
  - *Pteropus poliocephalus* (Grey-headed Flying-fox)

- 1 reptile
  - *Delma impar* (Striped Legless Lizard)

A search of the Department of Primary Industries (DPI) WeedWise database identified approximately 150 priority weeds for the Muswellbrook LGA.

Vegetation on site is primarily consists of rehabilitated pasture including exotic groundcover such as Kikuyu (*Pennisetum clandestinum*) and Rhodes grass (*Chloris gayana*) with occasional derived native species i.e. *Acacia* species. Rehabilitated woodland areas have been planted and consist of primarily native *Eucalypt* species. The potential north battery location and storage (Figure 1) also contains native over-storey and mid storey species. There were no threatened species observed and habitat for threatened species is regarded minimal considering the previous disturbance history and land use of the site.

Table 1 Site photographs

Plate 1 - Looking north on rehabilitated soil stockpile. LOW CONSTRAINT

Plate 2 - Looking east on rehabilitated soil stockpile toward planted native woodland vegetation. MODERATE CONSTRAINT

Plate 3 – Juvenile trees within rehabilitation area. MODERATE CONSTRAINT

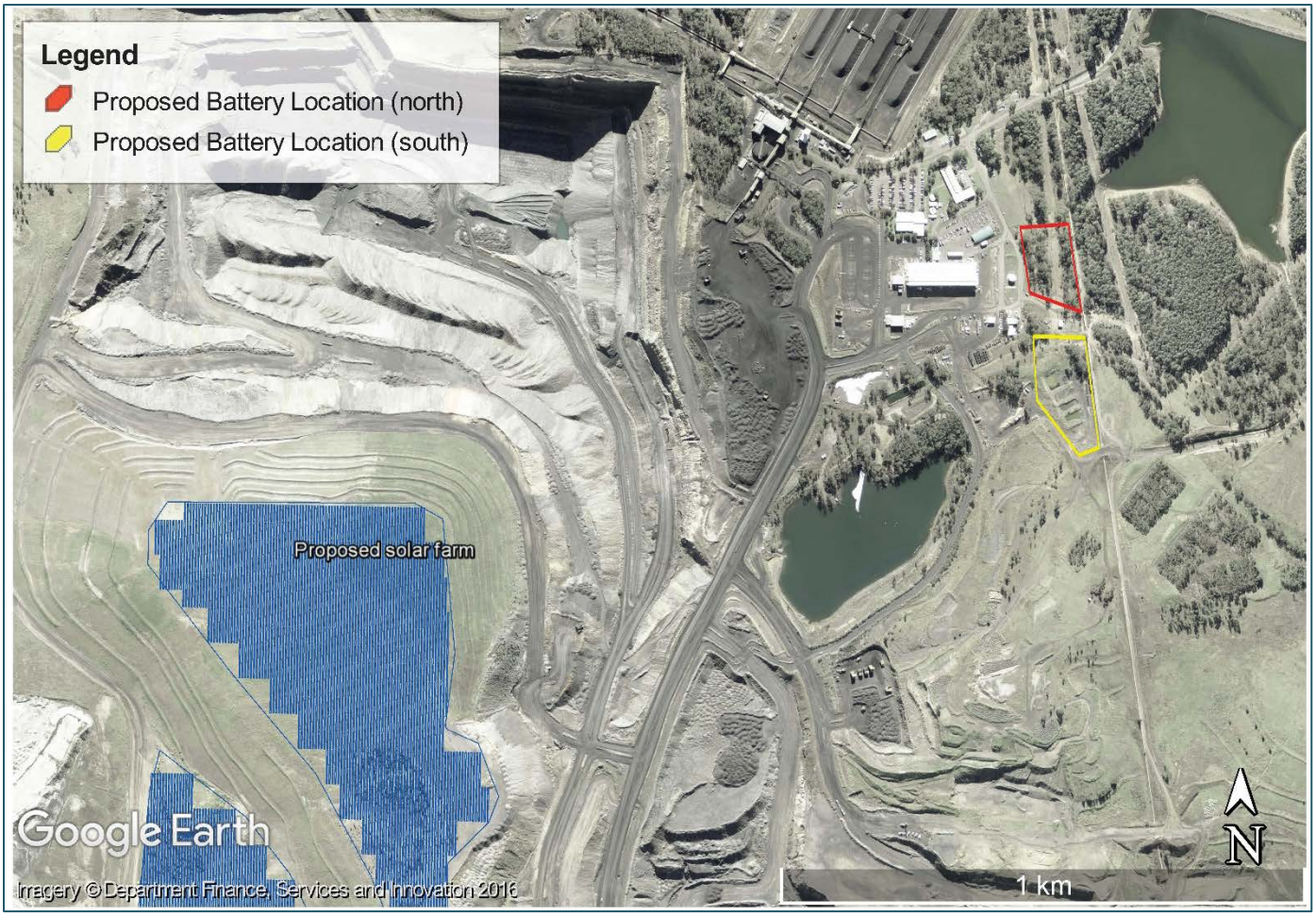

Figure 1 Proposed Battery Locations (Source: Google Earth Pro, 2017)

2.4 SOIL AND WATER

The site is in close proximity to four final voids which are used as water storages in the post-mining landscape. First and second order ephemeral creeks drain away from the proposal site and include Ramrod Creek, Saddlers Creek, Bayswater Creek and Saltwater Creek. Lake Liddell to the east and Plashett Reservoir to the south both act as receiving water bodies to surface water and groundwater flow.

Water quantities and sources required for construction and operation will be required to be detailed in the environmental assessment as part of the project description.

The site has been disturbed and rehabilitated during mining operations. Excavated topsoil from the mine workings has been stockpiled and used for the rehabilitation. The two main soil landscapes that occur within the proposal site are dark clays and yellow duplex soils and are associated with the Brays Hill Soil Landscape. Most component soils of the Brays Hill Soil Landscape, including the dark clays and yellow duplex soils identified on site, are moderately to strongly structured clays of high fertility.

Soil constraints are considered manageable but factors such as construction and access in wet conditions and means to control erosion during construction and operation will need to be considered in the design stage and project description.

A search of the NSW OEH Contaminated Sites Register on 13th September 2017 did not identify any sites within the Muswellbrook LGA. The site is however located within Muswellbrook. The site does not appear on the List of NSW contaminated sites notified to the Environmental Protection Authority (EPA), as at 13th September 2017. During the site inspection, it was noted that there are areas of potential contamination surrounding the proposal site including diesel storage facilities and refuelling areas as well as magazine (explosive) storage areas.

2.5 LAND USE

The proposed solar farm site is located within a mining and agricultural region surrounded by:

- Bayswater Power Station and Liddell Power Station to the south and southeast;
- The Antiene subdivision and grazing agricultural land to the north and northeast; and
- Mt Arthur Coal (MAC) to the west, southwest and northwest.

The town of Muswellbrook is approximately 13 km north of the proposed site. The southernmost residential areas of Muswellbrook are located approximately 4 to 5 km north of the site.

The solar farm operation is not considered to be incompatible with local land use activities. Construction, particularly the location of site access, should be considered with regard to local houses towards the north. Mitigation such as noise screens can be employed where high impacts are predicted.

The Wollemi National Park is approximately 17 km south of the site and is not visible from the site. No formalised amenity areas (such as picnic areas) are located in close proximity of the proposal site.

2.6 NOISE

The site is located south of Thomas Mitchell Drive and west of the New England Highway, approximately 13 km south-east of Muswellbrook. The western boundary of the proposal site adjoins MAC which includes Mount Arthur North, Bayswater No. 2 and Bayswater No. 3 Mines, while the southern and eastern boundaries adjoin Macquarie Generation's Bayswater Power Station. These adjacent industrial properties to the west, south and east do not contain any noise sensitive receivers. All residences in these directions are sufficiently distant that no noise or vibration impacts are likely to occur.

The Antiene rural residential area exists to the north of the mine and is access from the south via Thomas Mitchell Drive and Balmoral Road and from the north via the New England Highway and Pamger Drive, with Drayton owning many of the closest residential properties. Closest privately owned residences are located approximately 1.4 km from the proposed solar farm site.

Drayton Mine Environmental Assessment (Hansen Bailey, 2011) included an assessment of the background noise to sensitive receivers. The intrusive noise criteria at the closest Antiene residential receivers ranges between 35 to 37 dB (LAeq, 15min). As per the NSW Industrial Noise Policy (EPA, 2000), the RBL (rated background level) is the intrusive noise level minus 5 dB; therefore, the estimated background level is assumed to be 30 to 32 dB. This assessment was undertaken while the mine was operating, therefore, a conservative filter was applied to calculate the background level.

2.7 VISUAL AMENITY

Critical view areas to the east of the proposed solar farm are the New England Highway and areas around Lake Liddell. The wooded spur to the east of the proposal site provides screening to old mine workings and will provide similar screening to the proposed solar farm. However, at a limited number of locations on the highway where the elevation of the highway is higher than the site and where intervening hills so not screen the proposed solar farm there are glimpses of the site.

Forested areas to the north of Thomas Mitchell Drive provide important screening to the rural residential areas to the north and east of the proposal site. Some woodland/open forest areas south of Thomas Mitchell Drive and in the north eastern site boundary also provide screening to operational areas.

A combination of gentle topography and a minor spur immediately to the north west of the proposal site provide screening to most areas in the west. The exception is the elevated area adjacent to Roxburgh Road. However, this viewing zone is over 10 km away and the proposal would be seen in the context of the surrounding and existing land use.

The south of the proposed solar farm includes the sensitive vineyard and horse stud areas in the vicinity of Saddler's Creek. These areas are screened from the proposed solar farm by spurs radiating from Mount Arthur and the viewing zoning is over 10 km from the proposal site.

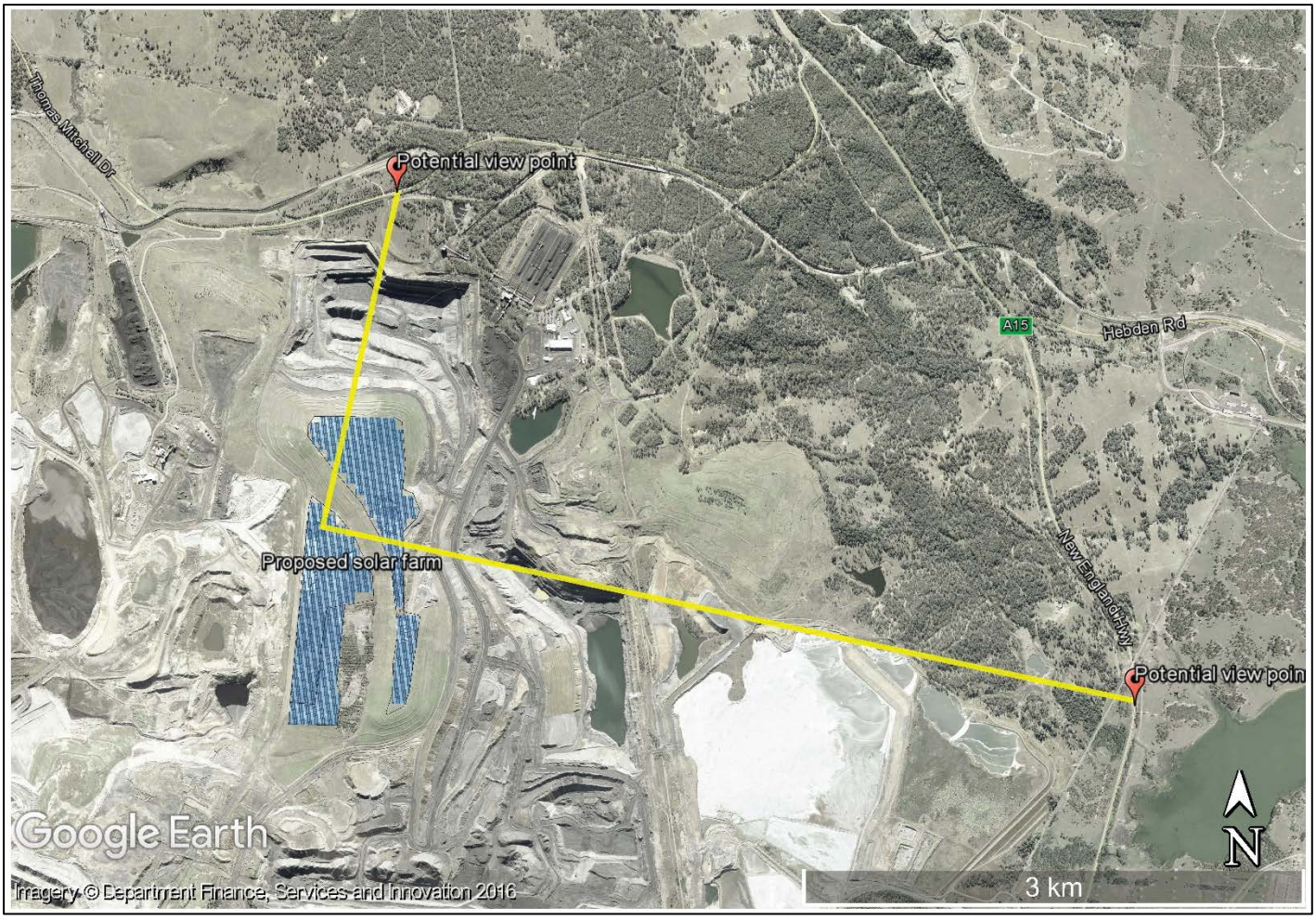

Figure 2 Potential view points of the proposed solar farm site from Thomas Mitchell Dr and the New England Hwy (Source: Google Earth Pro, 2017)

3 PRELIMINARY CONSTRAINTS ANALYSIS

3.1 METHODOLOGY

Risk rating is a factor of the **consequence** of an impact occurring and the **likelihood** of the impact occurring. Depending on the combination of consequence and likelihood, the overall risk rating could be low to extreme (refer Table 3). High to extreme risks would be identified as 'key risks', and implications of these risks in relation to each project site would be discussed. Where risks are identified as low to moderate, or where a risk is highly manageable (but may be identified as a higher risk), these would be identified and discussed. Where uncertainty exists, a higher constraint rating has been applied. Further investigation may reduce the constraint level.

Table 2 Risk assessment rating matrix

Likelihood	Consequence				
	Negligible	**Minor**	**Moderate**	**Major**	**Catastrophic**
Remote	Low	Low	Low	Medium	Medium
Unlikely	Low	Low	Medium	High	High
Possible	Low	Medium	High	Very High	Very High
Likely	Medium	High	Very High	Very High	Extreme
Almost certain/ inevitable	Medium	High	Very High	Extreme	Extreme

3.2 RESULTS

3.2.1 Low constraints (low risk)

Low risks are anticipated to have minimal impacts. These include;

- Soil and water
- Landuse conflicts
- Noise
- Aboriginal and non-Aboriginal Heritage

3.2.2 Medium constraints (medium risk)

Medium risks are anticipated as possible with moderate impacts. These include;

- Biodiversity- in both pasture and woodland areas
- Visual

3.2.3 *High constraints (high risk)*

High risks are likely with moderate to major impacts. Issues with government approval are likely and can be triggered by issues relating to the timing of submission of a MOP amendment before or after the Solar Farm development application.

Application under Part 4 of the EP&A Act for SSD is perceived as a high risk predominately due to the timing associated with approval. The SSD pathway is more predicable in comparison to the regional development pathway. Further time constraints can also be implemented with issues relating to further assessments including; scoping report, environmental assessment requirement (SEARs) etc. In addition, there is also a risk of the application going to the PAC if more than 25 submissions in opposition to the proposal are received. It is unlikely that the project would not be approved under this pathway.

3.2.4 *Very high constraints (very high risk)*

Application via Part 4 - Regional Development where MSC and the JRPP would approve the proposal is perceived as very high risk predominantly due to political and community issues that may arise during the approval process. Council may be supportive of the proposal and no issues may arise during the approval process however should political pressure be enforced from the community, this pathway is unpredictable and may result in significant delays and added cost to the application. It is unlikely that the project would not be approved under this pathway.

3.3 SUMMARY OF ENVIRONMENTAL AND PLANNING CONSTRAINTS

Issue	Sources of potential impact	Preliminary Risk priority	Investigation strategy
Planning Approvals/Pathway			
Planning Pathway – Regional Development (CapEx < $30m submission of DA to Muswellbrook Shire Council)	• Political risk in relation to Councillors, this would highest where community opposed to project. • Community issues that would result in potential for opposition to project (eg. from horse studs) • Council inexperienced with Solar Farm proposals, results in delays in receiving approval • Unpredictable timing for support/approval from council. The project could be assessed efficiently, however may be extending. Timing is also reliant on frequency of council meetings and approval on support of Councillors • Time delays in relation to assessment by the Joint Regional Planning Panel (JRPP), who meet every fortnight, and may require additional information prior to making recommendation	**Very high risk (in relation to both delays in timing of approval and risk of approval)**	Consultation with DRG and formal discussion with Planner at Muswellbrook Shire Council.
Planning Pathway – State Significant Development CapEx > $30m SSD submission of DA to DPE).	• Timing issues for approval • Risk of going to Planning Assessment Commission (PAC) if more than 25 submissions in opposition to the proposal • Requirements of SEARs may be onerous	**High (in relation to timing)**	Consultation with DRG and Department of Planning.

Issue	Sources of potential impact	Preliminary Risk priority	Investigation strategy
Modification to MOP	• Issues relating to timing of submission of a MOP amendment before or after the Solar Farm development application	**Medium**	Consultation on preferred timing with DRG.
Environmental Factors			
Biodiversity	• Clearing of rehabilitated woodland areas of native vegetation during construction and maintenance. • Unacceptable loss or modification of habitat • Delays with previously approved offsetting requirements • Delays due to assessment method ie requirement of a BDAR • BDAR requirement an increased risk for the area identified as proposed battery storage north due to less past disturbance and high abundance of native vegetation potentially impacted	**Low** for areas of pasture. **Medium** for woodland areas and battery storage area containing native vegetation	Part 4 Local Development / RDevelopment - Assessment as per council requirements. BDAR and BOS not required. Part 4 SSD – BDAR required, unless otherwise determined by OEH, however BOS unlikely to be triggered Consultation with relevant planning authorise to determine is BDAR is required.
Visual	• Reduced visual amenity during construction • Potential impact on scenic character, local viewpoints and cumulative visual impacts of infrastructure during operation	**Low**	Further investigation via visual assessment and community consultation. Visual assessment, (including cumulative assessment) would be prepared by a specialist, and included as a chapter of the EIS. Supplementary material may be appended.
Aboriginal Heritage	• Excavation that impacts Aboriginal heritage values and items are unlikely considering disturbance and land use history of the site	**Low**	Complete Archaeological Assessment, in accordance with OEH guidelines / consultation. Develop WRSF CHMP.
Non-Aboriginal Heritage	• Excavation or works that impact heritage values and items are unlikely considering disturbance and land use history of the site	**Low**	As above.

Issue	Sources of potential impact	Preliminary Risk priority	Investigation strategy
Noise	• Operation of plant and haulage traffic during construction • Operational noise (Design and placement of Power Conversion Blocks to minimise impact)	**Low**	Further investigation via acoustic assessment including modelling and mapping with respect to nearest receivers. Cumulative noise impacts with WRWF would be considered.
Land use conflicts	• Reduction in rehabilitation areas	**Low**	Would be addressed in appropriate chapter of EIS.
Soil and water	• Soil disturbance from vegetation clearing • Soil compaction from the transport of heavy equipment • Dust generation	**Low**	Identify risks in relevant chapters of EIS. Outline requirements for a detailed Erosion and Sediment Control Plan (to be developed prior to construction).

4 CONCLUSION

The high and very high risks identified above are very unlikely to result in non-approval of the solar farm, rather they would likely influence the timing of the approval process, and costs of the EIS (eg. if the preparation of a BDAR was required). It is recommended that consultation with the Department of Planning and Environment (DPE) and the Division of Resources and Geoscience (DRG) during the preparation of the EIS and an approach to managing the changes is agreed and implications for rehabilitation and any Drayton management plans are described in the EIS.

In addition, the proposed solar farm will necessitate amendment of the Mining Operations Plan (MOP) (which incorporates the requirements of a Final Void Management Plan and Mine Closure Plan) and a revision of the Rehabilitation Offset Management Plan. It is recommended that, prior to commencing preparation of the Development Application, Malabar consults with the DRG and the DPE about their preference regarding the timing of these amendments – i.e. prior to, or following, approval of a Development Consent for the solar farm. It is expected that DRG will prefer the amendment of the MOP to occur following the grant of Development Consent, so as not to pre-empt the approval. In this case, the EIS for the solar farm could transparently describe that a MOP amendment would occur following approval.

APPENDIX C DATABASE SEARCHES

Australian Government
Department of the Environment and Energy

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

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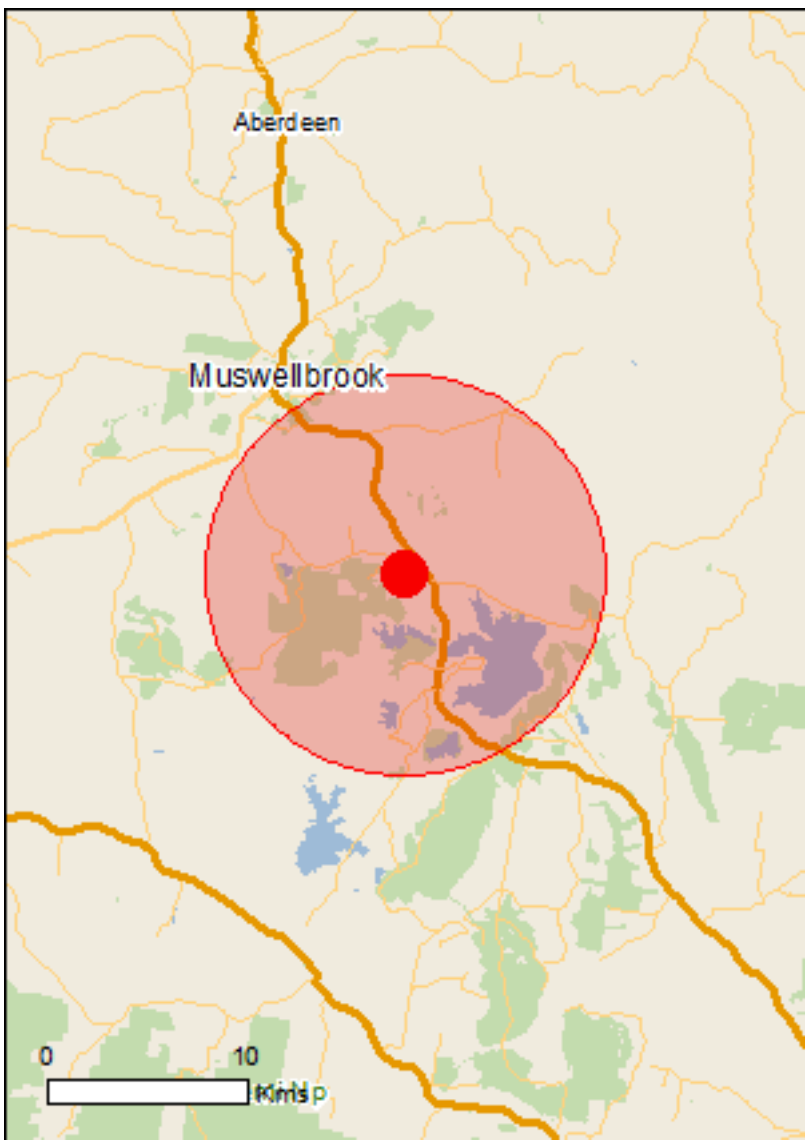

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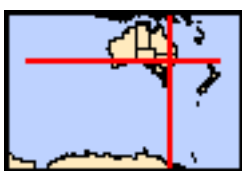

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	29
Listed Migratory Species:	14

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	4
Commonwealth Heritage Places:	None
Listed Marine Species:	21
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	None
Regional Forest Agreements:	1
Invasive Species:	32
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar) [Resource Information]

Name	Proximity
Hunter estuary wetlands	50 - 100km upstream

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Central Hunter Valley eucalypt forest and woodland	Critically Endangered	Community likely to occur within area
Hunter Valley Weeping Myall (Acacia pendula) Woodland	Critically Endangered	Community may occur within area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted-snipe, Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Frogs		

Name	Status	Type of Presence
Heleioporus australiacus		
Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat may occur within area
Litoria aurea		
Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat likely to occur within area
Litoria booroolongensis		
Booroolong Frog [1844]	Endangered	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri		
Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat known to occur within area
Dasyurus maculatus maculatus (SE mainland population)		
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Nyctophilus corbeni		
Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat likely to occur within area
Petauroides volans		
Greater Glider [254]	Vulnerable	Species or species habitat may occur within area
Petrogale penicillata		
Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Pseudomys novaehollandiae		
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus		
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Plants		
Androcalva procumbens		
[87153]	Vulnerable	Species or species habitat may occur within area
Cynanchum elegans		
White-flowered Wax Plant [12533]	Endangered	Species or species habitat may occur within area
Dichanthium setosum		
bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area
Eucalyptus glaucina		
Slaty Red Gum [5670]	Vulnerable	Species or species habitat likely to occur within area
Euphrasia arguta		
[4325]	Critically Endangered	Species or species habitat may occur within area
Philotheca ericifolia		
[64942]	Vulnerable	Species or species habitat may occur within area
Prasophyllum sp. Wybong (C.Phelps ORG 5269)		
a leek-orchid [81964]	Critically Endangered	Species or species habitat may occur within

Name	Status	Type of Presence
		area
[Pterostylis gibbosa](#) Illawarra Greenhood, Rufa Greenhood, Pouched Greenhood [4562]	Endangered	Species or species habitat may occur within area
[Thesium australe](#) Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
Reptiles		
[Delma impar](#) Striped Legless Lizard [1649]	Vulnerable	Species or species habitat known to occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
[Apus pacificus](#) Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
[Hirundapus caudacutus](#) White-throated Needletail [682]		Species or species habitat known to occur within area
[Monarcha melanopsis](#) Black-faced Monarch [609]		Species or species habitat known to occur within area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat may occur within area
[Myiagra cyanoleuca](#) Satin Flycatcher [612]		Species or species habitat known to occur within area
[Rhipidura rufifrons](#) Rufous Fantail [592]		Species or species habitat likely to occur within area
Migratory Wetlands Species		
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
[Pandion haliaetus](#) Osprey [952]		Species or species habitat likely to occur

Name	Threatened	Type of Presence within area
Tringa nebularia		
Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land -
Commonwealth Land - Australian Telecommunications Commission
Commonwealth Land - Defence Housing Authority
Defence - MUSWELLBROOK GRES DEPOT

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba		
Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans		
Black-eared Cuckoo [705]		Species or species habitat known to occur

Name	Threatened	Type of Presence within area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
[Hirundapus caudacutus](#) White-throated Needletail [682]		Species or species habitat known to occur within area
[Lathamus discolor](#) Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
[Merops ornatus](#) Rainbow Bee-eater [670]		Species or species habitat may occur within area
[Monarcha melanopsis](#) Black-faced Monarch [609]		Species or species habitat known to occur within area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat may occur within area
[Myiagra cyanoleuca](#) Satin Flycatcher [612]		Species or species habitat known to occur within area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
[Pandion haliaetus](#) Osprey [952]		Species or species habitat likely to occur within area
[Rhipidura rufifrons](#) Rufous Fantail [592]		Species or species habitat likely to occur within area
[Rostratula benghalensis (sensu lato)](#) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
[Tringa nebularia](#) Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

Extra Information

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

Name	State
North East NSW RFA	New South Wales

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Alauda arvensis Skylark [656]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat likely to occur within area
Dolichandra unguis-cati Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-32.33809 150.94596

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

Department of the Environment
GPO Box 787
Canberra ACT 2601 Australia
+61 2 6274 1111

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Report generated on 18/09/2018 2:12 PM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Community				*Central Hunter Grey Box-Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions*		Central Hunter Grey Box-Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions	E3	CE	K	
Community				*Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions*		Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions	E3	CE	K	
Community				*Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*		Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3	V	P	

Community	*Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3		K	
Community	*Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions*	Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions	E3		K	
Community	*Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions*	Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions	E3		K	
Community	*Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion*	Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion	V2	CE	K	
Community	*Hunter Valley Vine Thicket in the NSW North Coast and Sydney Basin Bioregions*	Hunter Valley Vine Thicket in the NSW North Coast and Sydney Basin Bioregions	E3		K	

Community	*Hunter Valley Weeping Myall Woodland in the Sydney Basin Bioregion*	Hunter Valley Weeping Myall Woodland in the Sydney Basin Bioregion	E4B	CE	K	
Community	*Kurri Sand Swamp Woodland in the Sydney Basin Bioregion*	Kurri Sand Swamp Woodland in the Sydney Basin Bioregion	E3		K	
Community	*Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3	CE	P	
Community	*Lower Hunter Spotted Gum-Ironbark Forest in the Sydney Basin Bioregion*	Lower Hunter Spotted Gum-Ironbark Forest in the Sydney Basin Bioregion	E3		K	
Community	*Lower Hunter Valley Dry Rainforest in the Sydney Basin and NSW North Coast Bioregions*	Lower Hunter Valley Dry Rainforest in the Sydney Basin and NSW North Coast Bioregions	V2		K	
Community	*Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions*	Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions	E3	CE	K	

Community	*River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3		K	
Community	*Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3		K	
Community	*Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3		K	
Community	*Sydney Freshwater Wetlands in the Sydney Basin Bioregion*	Sydney Freshwater Wetlands in the Sydney Basin Bioregion	E3		K	
Community	*Warkworth Sands Woodland in the Sydney Basin Bioregion*	Warkworth Sands Woodland in the Sydney Basin Bioregion	E3	CE	K	
Community	*White Box Yellow Box Blakelyâ€™s Red Gum Woodland*	White Box Yellow Box Blakelyâ€™s Red Gum Woodland	E3	CE	K	

Data from the BioNet BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1Â°; ^^ rounded to 0.01Â°). Copyright the State of NSW through the Office of Environment and Heritage. Search criteria : Public Report of all Valid Records of Threatened (listed on TSC Act 1995) ,Commonwealth listed ,CAMBA listed ,JAMBA listed or ROKAMBA listed Animals in selected area [North: -32.29 West: 150.88 East: 150.98 South: -32.39] returned a total of 154 records of 29 species.
Report generated on 18/09/2018 2:11 PM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Animalia	Aves	Anseranatidae	0199	*Anseranas semipalmata*		Magpie Goose	V,P		1	
Animalia	Aves	Apodidae	0334	*Hirundapus caudacutus*		White-throated Needletail	P	C,J,K	2	
Animalia	Aves	Ardeidae	0977	*Ardea ibis*		Cattle Egret	P	C,J	2	
Animalia	Aves	Accipitridae	0226	*Haliaeetus leucogaster*		White-bellied Sea-Eagle	V,P	C	3	
Animalia	Aves	Accipitridae	0225	*Hieraaetus morphnoides*		Little Eagle	V,P		1	
Animalia	Aves	Accipitridae	0230	*^^Lophoictinia isura*		Square-tailed Kite	V,P,3		1	
Animalia	Aves	Laridae	0112	*Hydroprogne caspia*		Caspian Tern	P	C,J	2	
Animalia	Aves	Psittacidae	0260	*Glossopsitta pusilla*		Little Lorikeet	V,P		8	
Animalia	Aves	Psittacidae	0309	*^^Lathamus discolor*		Swift Parrot	E1,P,3	CE	4	
Animalia	Aves	Meropidae	0329	*Merops ornatus*		Rainbow Bee-eater	P	J	3	
Animalia	Aves	Climacteridae	8127	*Climacteris picumnus victoriae*		Brown Treecreeper (eastern subspecies)	V,P		3	
Animalia	Aves	Acanthizidae	0504	*Chthonicola sagittata*		Speckled Warbler	V,P		14	
Animalia	Aves	Pomatostomidae	8388	*Pomatostomus temporalis temporalis*		Grey-crowned Babbler (eastern subspecies)	V,P		11	
Animalia	Aves	Neosittidae	0549	*Daphoenositta chrysoptera*		Varied Sittella	V,P		5	
Animalia	Aves	Artamidae	8519	*Artamus cyanopterus cyanopterus*		Dusky Woodswallow	V,P		2	

Animalia	Aves	Petroicidae	8367	*Melanodryas cucullata cucullata*	Hooded Robin (south-eastern form)	V,P		1
Animalia	Mammalia	Dasyuridae	1008	*Dasyurus maculatus*	Spotted-tailed Quoll	V,P	E	4
Animalia	Mammalia	Dasyuridae	1017	*Phascogale tapoatafa*	Brush-tailed Phascogale	V,P		2
Animalia	Mammalia	Phascolarctidae	1162	*Phascolarctos cinereus*	Koala	V,P	V	2
Animalia	Mammalia	Petauridae	1137	*Petaurus norfolcensis*	Squirrel Glider	V,P		14
Animalia	Mammalia	Pteropodidae	1280	*Pteropus poliocephalus*	Grey-headed Flying-fox	V,P	V	1
Animalia	Mammalia	Emballonuridae	1321	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V,P		2
Animalia	Mammalia	Molossidae	1329	*Mormopterus norfolkensis*	Eastern Freetail-bat	V,P		14
Animalia	Mammalia	Vespertilionidae	1372	*Falsistrellus tasmaniensis*	Eastern False Pipistrelle	V,P		8
Animalia	Mammalia	Vespertilionidae	1346	*Miniopterus australis*	Little Bentwing-bat	V,P		5
Animalia	Mammalia	Vespertilionidae	1834	*Miniopterus schreibersii oceanensis*	Eastern Bentwing-bat	V,P		20
Animalia	Mammalia	Vespertilionidae	1357	*Myotis macropus*	Southern Myotis	V,P		5
Animalia	Mammalia	Vespertilionidae	1361	*Scoteanax rueppellii*	Greater Broad-nosed Bat	V,P		8
Animalia	Mammalia	Vespertilionidae	1025	*Vespadelus troughtoni*	Eastern Cave Bat	V,P		6

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Report generated on 18/09/2018 2:12 PM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Plantae	Flora	Myrtaceae	4096	*Eucalyptus glaucina*		Slaty Red Gum	V,P	V	9	
Plantae	Flora	Myrtaceae	4134	*Eucalyptus nicholii*		Narrow-leaved Black Peppermint	V,P	V	1	
Plantae	Flora	Orchidaceae	6399	*^Cymbidium canaliculatum*		Cymbidium canaliculatum population in the Hunter Catchment	E2,P,2		6	
Plantae	Flora	Orchidaceae	4457	*^Diuris tricolor*		Pine Donkey Orchid	V,P,2		337	
Plantae	Flora	Orchidaceae	4457	*^Diuris tricolor*		Pine Donkey Orchid population in the Muswellbrook local government area	E2,V,P,2		337	

Search results

Your search for:LGA: Muswellbrook Shire Council

Search Again
Refine Search

did not find any records in our database.

If a site does not appear on the record it may still be affected by contamination. For example:

- Contamination may be present but the site has not been regulated by the EPA under the Contaminated Land Management Act 1997 or the Environmentally Hazardous Chemicals Act 1985.
- The EPA may be regulating contamination at the site through a licence or notice under the Protection of the Environment Operations Act 1997 (POEO Act).
- Contamination at the site may be being managed under the planning process.

Search TIP

To search for a specific site, search by LGA (local government area) and carefully review all sites listed.

... more search tips

More information about particular sites may be available from:

- The POEO public register
- The appropriate planning authority: for example, on a planning certificate issued by the local council under section 149 of the Environmental Planning and Assessment Act.

See What's in the record and What's not in the record.

If you want to know whether a specific site has been the subject of notices issued by the EPA under the CLM Act, we suggest that you search by Local Government Area only and carefully review the sites that are listed.
This public record provides information about sites regulated by the EPA under the Contaminated Land Management Act 1997, including sites currently and previously regulated under the Environmentally Hazardous Chemicals Act 1985. Your inquiry using the above search criteria has not matched any record of current or former regulation. You should consider searching again using different criteria. The fact that a site does not appear on the record does not necessarily mean that it is not affected by contamination. The site may have been notified to the EPA but not yet assessed, or contamination may be present but the site is not yet being regulated by the EPA. Further information about particular sites may be available from the appropriate planning authority, for example, on a planning certificate issued by the local council under section 149 of the Environmental Planning and Assessment Act. In addition the EPA may be regulating contamination at the site through a licence under the Protection of the Environment Operations Act 1997. You may wish to search the POEO public register

19 September 2018

For

business and industry

For local government

Contact us

131 555 (tel:131555)

info@epa.nsw.gov.au (mailto:info@epa.nsw.gov.au)

EPA Office Locations (https://www.epa.nsw.gov.au/about-us/contact-us/locations)

(https://twitter.com

Search Results

47 results found.

Baerami Homestead 300 Baerami Creek Rd	Baerami via Sandy Hollow, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Balmoral 310 Denman Rd	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Barber Shop (former) 7 Sydney St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Birralee 33 Brentwood St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Brighton Villa 12 Hunters Tce	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Denman Courthouse (former) Palace St	Denman, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Eatons Hotel 180-188 Bridge St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Eatons Hotel Group 164-188 Bridge St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Edinglassie 710 Denman Rd	Muswellbrook, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Goulburn River National Park Kerrabee Rd	Sandy Hollow, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)

Hennor and Garden 3 Lorne St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
House 178 Bridge St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
House - St Vincent De Paul Shop 174-176 Bridge St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
House and Former Shop 164-166 Bridge St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Hunter River Road Bridge Kayuga Rd	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Indigenous Place	Sandy Hollow, NSW, Australia	(Removed from Register or IL) Register of the National Estate (Non-statutory archive)
Loxton House 142-144 Bridge St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Manobalai Nature Reserve (1978 boundary) Dry Creek Rd	Wybong, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Masonic Hall 75 Bridge St	Muswellbrook, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Merton Cottage 4883 Jerrys Plains Rd	Denman, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Muswellbrook Post Office 7 Bridge St	Muswellbrook, NSW, Australia	(Listed place) Commonwealth Heritage List

Overdene 79 Bengalla Rd	Bengalla via Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Pickering and Outbuildings 221 Mangoola Rd	Denman, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Police Station William St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Presbyterian Church (original building) Hill St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Presbyterian Manse (former) 106 Hill St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Railway Cottage and Adjacent Fig Tree 27 Brook St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Railway Hotel 10-14 Market St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Railway Station Market St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Royal Hotel (former) 1 Sydney St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Shop (former) 172 Bridge St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Skellatar Tindale St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)

St Albans Anglican Church & Grounds Brook St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
St Albans Precinct Brook St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
St Albans Rectory Brook St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
St Albans Sunday School 15 HuntersTce	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
St James Catholic Church 4 Brook St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
St Johns Presbyterian Church Hill St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
St Johns Presbyterian Church Precinct Hill St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
St Matthias Anglican Church 23-25 Palace St	Denman, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
The Blue Mountains	Katoomba, NSW, Australia	(Indicative place) Register of the National Estate (Non-statutory archive)
The Greater Blue Mountains Area Great Western Hwy	Katoomba, NSW, Australia	(Declared property) World Heritage List
The Greater Blue Mountains Area Greater Western Hwy	Katoomba, NSW, Australia	(Listed place) National Heritage List
The Greater Blue Mountains Area - Additional Values Great Western Hwy	Katoomba, NSW, Australia	(Nominated place) National Heritage List

Trinity Uniting Church 110 Bridge St	Muswellbrook, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Weidmann Cottage (former) 132-134 Bridge St	Muswellbrook, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Wollemi National Park (1980 boundary) The Putty Rd	Singleton, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)

Report Produced: Wed Oct 31 11:23:42 2018

Office of Environment & Heritage

Home > Topics > Heritage places and items > Search for heritage

Search for NSW heritage

Return to search page where you can refine/broaden your search.

Statutory listed items

Information and items listed in the State Heritage Inventory come from a number of sources. This means that there may be several entries for the same heritage item in the database. For clarity, the search results have been divided into three sections.

- **Section 1** - contains Aboriginal Places declared by the **Minister for the Environment** under the National Parks and Wildlife Act. This information is provided by the Heritage Division.
- **Section 2** - contains heritage items listed by the **Heritage Council of NSW** under the NSW Heritage Act. This includes listing on the State Heritage Register, an Interim Heritage Order or protected under section 136 of the NSW Heritage Act. This information is provided by the Heritage Division.
- **Section 3** - contains items listed by **local councils** on Local Environmental Plans under the Environmental Planning and Assessment Act, 1979 and **State government agencies** under s.170 of the Heritage Act. This information is provided by local councils and State government agencies.

Section 1. Aboriginal Places listed under the National Parks and Wildlife Act.

Your search did not return any matching results.

Section 2. Items listed under the NSW Heritage Act.

Your search returned 8 records.

Item name	Address	Suburb	LGA	SHR
Eatons Hotel & St Vincent De Paul Group	178, 180-188 Bridge Street	Muswellbrook	Muswellbrook	00331
Edinglassie	710 Denman Road	Muswellbrook	Muswellbrook	00170
Loxton House	142-144 Bridge Street	Muswellbrook	Muswellbrook	00185
Merton	4883 Jerrys Plains Road	Denman	Muswellbrook	00159
Muswellbrook Railway Station and yard group	Main Northern railway	Muswellbrook	Muswellbrook	01208
Rous Lench	Denman Road	Edinglassie	Muswellbrook	00211
St. Alban's Anglican Church	Hunter Terrace	Muswellbrook	Muswellbrook	00458
Weidmann Cottage	132 Bridge Street	Muswellbrook	Muswellbrook	00260

Section 3. Items listed by Local Government and State Agencies.

Your search returned 205 records.

Item name	Address	Suburb	LGA	Information source
Armitage House	2 Armitage Avenue	Muswellbrook	Muswellbrook	LGOV
Army munitions base	495 Rosemount Road	Denman	Muswellbrook	LGOV
Atherstone	5 Sowerby Street	Muswellbrook	Muswellbrook	GAZ
Atherstone	5 Sowerby Street	Muswellbrook	Muswellbrook	LGOV

Baerami Creek Shale Mines and Retort	Baerami Creek Road	Baerami	Muswellbrook	LGOV
Baerami Homestead	Berami Road via Sandy Hollow	Denman	Muswellbrook	GAZ
Baerami Homestead (including pedestrian bridge)	300 Baerami Creek Road	Baerami	Muswellbrook	LGOV
Baerami School of Arts	1361 Bylong Valley Way	Baerami	Muswellbrook	LGOV
Bakery	49 Ogilvie Street	Denman	Muswellbrook	LGOV
Balmoral	310 Denman Road	Muswellbrook	Muswellbrook	LGOV
Balmoral	Denman Road	Muswellbrook	Muswellbrook	GAZ
Barber Shop	5 Sydney Street	Muswellbrook	Muswellbrook	GAZ
Beer Homestead	721 Edderton Road	Muswellbrook	Muswellbrook	LGOV
Belmont	721 Edderton Road	Muswellbrook	Muswellbrook	LGOV
Bengalla Homestead	183 Bengalla Road	Bengalla	Muswellbrook	LGOV
Billiards Building	36-40 Bridge Street	Muswellbrook	Muswellbrook	LGOV
Birralee	33 Brentwood Street (Cnr Brecht Street)	Muswellbrook	Muswellbrook	LGOV
Birralee	Brecht Street	Muswellbrook	Muswellbrook	GAZ
Blunt's Butter Factory	179 Overton Road	Bengalla	Muswellbrook	LGOV
Brighton Villa	12 Hunter Street	Muswellbrook	Muswellbrook	GAZ
Brighton Villa	12 Hunter Terrace	Muswellbrook	Muswellbrook	LGOV
Brogheda	6 Yarraman Road	Manobalai	Muswellbrook	LGOV
Business Heritage Conservation Area		Muswellbrook	Muswellbrook	LGOV
Campbell & Co Store, Former	54	Muswellbrook	Muswellbrook	GAZ
Campbell's Corner	60 Bridge Street	Muswellbrook	Muswellbrook	LGOV
Cordial Factory (Demolished)	Muswellbrook Road	Denman	Muswellbrook	LGOV
Courthouse & Police Station, Former	Palace Street	Denman	Muswellbrook	GAZ
Dalmar Stud	690 Bengalla Road	Bengalla	Muswellbrook	LGOV
Denman Bridge over Hunter River	Golden Highway	Denman	Muswellbrook	SGOV
Denman Conservation Area		Denman	Muswellbrook	GAZ
Denman Heritage Conservation Area		Denman	Muswellbrook	LGOV
Denman Hotel	1-5 Ogilvie Street (corner of Palace Street)	Denman	Muswellbrook	LGOV
Denman Masonic Lodge	18 Jerdan Street	Denman	Muswellbrook	LGOV
Denman Memorial Hall	30 Ogilvie Street	Denman	Muswellbrook	LGOV
Eatons Group	164-166,172, 174, 178, 180 and 188 Bridge Street	Muswellbrook	Muswellbrook	GAZ

Eatons Group - house	178 Bridge Street	Muswellbrook	Muswellbrook	LGOV
Eatons Group - shop	172 Bridge Street	Muswellbrook	Muswellbrook	LGOV
Eatons Group - St Vincent de Paul Society building	174-176 Bridge Street	Muswellbrook	Muswellbrook	LGOV
Eatons Hotel	182-184 Bridge Street	Muswellbrook	Muswellbrook	LGOV
Edderton Homestead	Edderton Road	Muswellbrook	Muswellbrook	LGOV
Edinglassie	710 Denman Road	Muswellbrook	Muswellbrook	LGOV
Edward Higgens Building	30-32 Bridge Street	Muswellbrook	Muswellbrook	LGOV
Ellamara	1831 Merriwa Road	Sandy Hollow	Muswellbrook	LGOV
Fairview	Hebden Road	Liddell	Muswellbrook	LGOV
Farrells Auto One	5 Maitland Street	Muswellbrook	Muswellbrook	LGOV
Fitzgerald /Olympic Park Gates	Wilkinson Avenue	Muswellbrook	Muswellbrook	LGOV
Former Anglican Church Rectory	21 Palace Street	Denman	Muswellbrook	LGOV
Former barber shop	7 Sydney Street	Muswellbrook	Muswellbrook	LGOV
Former butter factory	14-15 Aberdeen Street	Muswellbrook	Muswellbrook	LGOV
Former Campbell's and Co store	52 Bridge Street	Muswellbrook	Muswellbrook	LGOV
Former CBC Bank	35 Ogilvie Street	Denman	Muswellbrook	LGOV
Former Court House Group - police station, residence and lockup	32 Palace Street	Denman	Muswellbrook	LGOV
Former hospital	37 Sowerby Street	Muswellbrook	Muswellbrook	LGOV
Former picture theatre	17 Bridge Street	Muswellbrook	Muswellbrook	LGOV
Former post office	3179 Bylong Valley Way	Kerrabee	Muswellbrook	LGOV
Former Presbyterian manse	106 Hill Street	Muswellbrook	Muswellbrook	LGOV
Former private hospital	5 Crinoline Street	Denman	Muswellbrook	LGOV
Former Royal Hotel	1 Sydney Street	Muswellbrook	Muswellbrook	LGOV
Former School and Residence	1828 Merriwa Road	Ginats Creek	Muswellbrook	LGOV
Former school residence	80 Palace Street	Denman	Muswellbrook	LGOV
Former St John's Presbyterian Church **PREVIOUS/OTHER NAME St Johns Presb**	Hill Street	Muswellbrook	Muswellbrook	LGOV
Gelston	409 Sandy Creek Road	Muswellbrook	Muswellbrook	LGOV
Glenmunro - slab kitchen	4372 Jerrys Plains Road	Denman	Muswellbrook	LGOV
Goulburn River National Park	Goulburn River	Baerami	Muswellbrook	LGOV
Hennor	18-20 Maitland Street	Muswellbrook	Muswellbrook	LGOV
Hennor	Maitland Road	Muswellbrook	Muswellbrook	GAZ

Hillcrest	311 Hebden Road	Liddell	Muswellbrook	LGOV
Holbrook Stud	2030 Widden Valley Road	Baerami	Muswellbrook	LGOV
Hollydeen Shop and Garage	1010 Merriwa Road (Cnr Reedy Creek Road)	Hollydeen	Muswellbrook	LGOV
Hospital, Former	37 Sowerby Street	Muswellbrook	Muswellbrook	GAZ
House	5 Midanga Avenue	Muswellbrook	Muswellbrook	LGOV
House	9-11 Hunter Terrace	Muswellbrook	Muswellbrook	LGOV
Item	15 Hunter Terrace	Muswellbrook	Muswellbrook	GAZ
Item	27 Brovic Street	Muswellbrook	Muswellbrook	GAZ
Jerrys Plains Official Residence	Doyle Street	Jerrys Plains	Muswellbrook	SGOV
Kayuga	731 Kayuga Road	Kayuga	Muswellbrook	LGOV
Kayuga Bridge	Kayuga Road	Muswellbrook	Muswellbrook	LGOV
Kayuga Bridge over Hunter River	Kayuga Road	Muswellbrook	Muswellbrook	SGOV
Kerb and Guttering - Brook Street	Brook Street (Bridge Street to railway line)	Muswellbrook	Muswellbrook	LGOV
Kerb and Guttering - Sydney Street	Sydney Street (Maitland Street to Haydon Street)	Muswellbrook	Muswellbrook	LGOV
Keys Family Private Cemetery	Bengalla Road	Bengalla	Muswellbrook	LGOV
Keys Family Private Cemetery	Bengalla Road	Bengalla	Muswellbrook	GAZ
Kildonan	208 Bridge Street	Muswellbrook	Muswellbrook	LGOV
Koobahla Villa	Cook Street	Muswellbrook	Muswellbrook	GAZ
Koombahla Villa	23 Cook Street (Cnr Carl Street)	Muswellbrook	Muswellbrook	LGOV
Lime Kiln - E.I.E.I.O	540 Sandy Creek Road	Muswellbrook	Muswellbrook	LGOV
Loxton House	140-142 Bridge Street	Muswellbrook	Muswellbrook	LGOV
Manobalai Nature Reserve	Yarraman Road	Manobalai	Muswellbrook	LGOV
Martindale	Martindale Road	Denman	Muswellbrook	GAZ
Martindale Homestead	1150 Martindale Road	Denman	Muswellbrook	LGOV
Masonic Hall		Muswellbrook	Muswellbrook	GAZ
Masonic Lodge	75 Bridge Street	Muswellbrook	Muswellbrook	LGOV
Merton	4883 Jerrys Plains Road	Denman	Muswellbrook	LGOV
Merton Cemetery	5052 Jerrys Plains Road	Denman	Muswellbrook	LGOV
Merton Cemetery		Denman	Muswellbrook	GAZ
Minch's Wine Shop	18 Foley Street	Muswellbrook	Muswellbrook	LGOV
Muswellbrook Ambulance	Market, William Streets	Muswellbrook	Muswellbrook	SGOV
Muswellbrook Brick Works	Muswellbrook Common	Muswellbrook	Muswellbrook	LGOV
Muswellbrook Bridge	Kayuga Road	Muswellbrook	Muswellbrook	GAZ

Muswellbrook Cemetery	Bowman and Brecht Streets	Muswellbrook	Muswellbrook	LGOV
Muswellbrook Conservation Area		Muswellbrook	Muswellbrook	GAZ
Muswellbrook High School	King Street	Muswellbrook	Muswellbrook	LGOV
Muswellbrook Hotel	46 Market Street (Cnr Carl Street)	Muswellbrook	Muswellbrook	LGOV
Muswellbrook Hunter River Underbridge	Railway Locations, Ulan Line, 289.304 & 327.079 Kms		Muswellbrook	SGOV
Muswellbrook Infants School	Dolahenty Street (corner of King Street)	Muswellbrook	Muswellbrook	LGOV
Muswellbrook Police Station	William Street	Muswellbrook	Muswellbrook	LGOV
Muswellbrook Police Station , Former	26 William Street	Muswellbrook	Muswellbrook	SGOV
Muswellbrook Post Office	7 Bridge Street	Muswellbrook	Muswellbrook	LGOV
Muswellbrook Railway Precinct	Market Street	Muswellbrook	Muswellbrook	SGOV
Muswellbrook Railway Precinct	Market Street	Muswellbrook	Muswellbrook	SGOV
Muswellbrook Railway Station	Market Street	Muswellbrook	Muswellbrook	GAZ
Muswellbrook Railway Station	Market Street	Muswellbrook	Muswellbrook	LGOV
National Australia Bank building	46-50 Bridge Street	Muswellbrook	Muswellbrook	LGOV
Negoa Homestead	92 Wiltons Lane	Kayuga	Muswellbrook	LGOV
Negoa Homestead	Kayuga Road	Muswellbrook	Muswellbrook	GAZ
Oak Milk Factory	Hunter Street	Muswellbrook	Muswellbrook	LGOV
Old Kayuga Cemetery	Kayuga Road	Kayuga	Muswellbrook	GAZ
Old Kayuga Cemetery	30 Stair Street	Kayuga	Muswellbrook	LGOV
Old Kerrabee Homestead	3179 Bylong Valley Way	Kerrabee	Muswellbrook	LGOV
Olinda		Denman	Muswellbrook	GAZ
Olinda (Demolished)	Merriwa Road	Denman	Muswellbrook	LGOV
Original buildings	Ogilvie,virginia Streets	Denman	Muswellbrook	SGOV
Overdene	79 Bengalla Road	Muswellbrook	Muswellbrook	LGOV
Overdene	Bengalla Road	Muswellbrook	Muswellbrook	GAZ
Pickering	Mangoola Road	Denman	Muswellbrook	GAZ
Pickering	221 Mangoola Road	Denman	Muswellbrook	LGOV
Piercefield and Outbuildings	1532-1618 Denman Road	Denman	Muswellbrook	LGOV
Plashett Homestead	Edderton Road	Muswellbrook	Muswellbrook	LGOV
Police Residence, Former	Palace Street	Denman	Muswellbrook	GAZ
Police Station	William Street	Muswellbrook	Muswellbrook	GAZ
Portable Timber Lockup	Palace Street	Denman	Muswellbrook	GAZ

Post Office		Muswellbrook	Muswellbrook	GAZ
Presbyterian Manse	106 Hill Street	Muswellbrook	Muswellbrook	GAZ
Prince of Wales Tavern	28-30 Sydney Street	Muswellbrook	Muswellbrook	LGOV
Railway Depot	Victoria Street	Muswellbrook	Muswellbrook	GAZ
Railway depot (roundhouse)	Bell Street	Muswellbrook	Muswellbrook	LGOV
Railway Hotel	10-14 Market Street	Muswellbrook	Muswellbrook	LGOV
Railway signal box	Market Street	Muswellbrook	Muswellbrook	LGOV
Railway Terminus Site	Turner Street	Denman	Muswellbrook	LGOV
Residence - Timber Cottage	12 Palace Street	Denman	Muswellbrook	LGOV
Residential Heritage Conservation Area		Muswellbrook	Muswellbrook	LGOV
Roman Catholic Church	Palace Street	Denman	Muswellbrook	GAZ
Rosemount Winery	659 Rosemount Road	Denman	Muswellbrook	LGOV
Rosevale Cottage	687 Kayuga Road	Kayuga	Muswellbrook	LGOV
Rous Lench	710 Denman Road	Muswellbrook	Muswellbrook	LGOV
Royal Hotel	10-16 Bridge Street	Muswellbrook	Muswellbrook	LGOV
Royal Hotel	10 Ogilvie Street (corner of Palace Street)	Denman	Muswellbrook	LGOV
Royal Hotel	Palace Street	Denman	Muswellbrook	GAZ
Royal Hotel (original)	Ogilvie Street	Denman	Muswellbrook	LGOV
Royal Hotel, Former	1 Sydney Street	Muswellbrook	Muswellbrook	GAZ
Rumbo Bush School	"Mayland"	Denman	Muswellbrook	LGOV
Rural Bank Buidling (Demolished - 1991)	45 Bridge Street (Cnr Brook Street)	Muswellbrook	Muswellbrook	LGOV
School of Arts	Main Road	Baerami	Muswellbrook	GAZ
School of Arts/Town Hall	3 Bridge Street	Muswellbrook	Muswellbrook	LGOV
Shale Oil Retort Relics	1590 Merriwa Road	Sandy Hollow	Muswellbrook	LGOV
Shamrock Hotel	30 William Street	Muswellbrook	Muswellbrook	LGOV
Shop façade	34 Bridge Street	Muswellbrook	Muswellbrook	GAZ
Shop Front		Muswellbrook	Muswellbrook	LGOV
Shop front	34 Bridge Street	Muswellbrook	Muswellbrook	LGOV
Simpson Park and Reserve	Market Street (corner of Sydney Street)	Muswellbrook	Muswellbrook	LGOV
Skellatar - St Mary's Catholic School	17 Fitzgerald Avenue	Muswellbrook	Muswellbrook	LGOV
Slab Cottage	Main Road	Kerrabee	Muswellbrook	GAZ
St Alban's Anglican Church	20 Brook Street	Muswellbrook	Muswellbrook	LGOV
St Alban's Anglican Church	Corner Hunter Terrace	Muswellbrook	Muswellbrook	LGOV

Rectory	and Brook Street			
St Alban's Anglican Church Sunday School	15 Hunter Terrace	Muswellbrook	Muswellbrook	LGOV
St Alban's Group	Brook Street	Muswellbrook	Muswellbrook	LGOV
St Alban's Precinct	Brook Street and Hunter Terrace	Muswellbrook	Muswellbrook	GAZ
St Alban's Precinct	Brovic Street	Muswellbrook	Muswellbrook	GAZ
St Alban's Precinct	Hunter Terrace	Muswellbrook	Muswellbrook	GAZ
St Heliers	70 St Heliers Road	Muswellbrook	Muswellbrook	LGOV
St Heliers Correctional Centre	McCully's Gap Road	Muswellbrook	Muswellbrook	SGOV
St Heliers Correctional Centre - Admin & outbuildings	McCully's Gap Road	Muswellbrook	Muswellbrook	SGOV
St Heliers Correctional Centre - Officers Accommodation	McCully's Gap Road	Muswellbrook	Muswellbrook	SGOV
St Heliers Correctional Centre - Stables	McCully's Gap Road	Muswellbrook	Muswellbrook	SGOV
St James' Roman Catholic Church	Brook Street	Muswellbrook	Muswellbrook	LGOV
St James' Roman Catholic Church Convent	Brook Street	Muswellbrook	Muswellbrook	LGOV
St James' Roman Catholic Presbytery	4 Sowerby Street	Muswellbrook	Muswellbrook	LGOV
St John's Anglican Church	1824 Merriwa Road	Giants Creek	Muswellbrook	LGOV
St John's Presbyterian Church	Hill Street	Muswellbrook	Muswellbrook	LGOV
St Joseph's Hall	80 Palace Street	Denman	Muswellbrook	LGOV
St Matthias' Anglican Church	33-35 Palace Street	Denman	Muswellbrook	LGOV
St. Heliers	McCulleys Gap Road	Muswellbrook	Muswellbrook	GAZ
St. James Roman Catholic Church including surrounds	Brook Street	Muswellbrook	Muswellbrook	GAZ
St. John's Presbyterian Church Precinct	Hill Street	Muswellbrook	Muswellbrook	GAZ
St. Mary's School Skelletar	Tindale Street	Muswellbrook	Muswellbrook	GAZ
St. Matthias Anglican Church	Palace Street	Denman	Muswellbrook	GAZ
Stone Bridge	Grass Tree Road	Muswellbrook	Muswellbrook	GAZ
Stone Bridge	Muscle Creek Road	Muswellbrook	Muswellbrook	LGOV
Taskers Pharmacy	26 Bridge Street	Muswellbrook	Muswellbrook	LGOV
Timber Cottage	129 Hill Street	Muswellbrook	Muswellbrook	LGOV
Uniting Church		Muswellbrook	Muswellbrook	GAZ
Uniting Church - Upper Hunter Parish Trinity Uniting Church	110 Bridge Street	Muswellbrook	Muswellbrook	LGOV
Valley Hotel/Motel	33 Sydney Street	Muswellbrook	Muswellbrook	LGOV
Water Pumping Station	Palace Street	Denman	Muswellbrook	LGOV

(Demolished)				
Weatherboard Hall	50 Palace Street (Cnr Turtle Street)	Denman	Muswellbrook	LGOV
Weidmann Cottage	126 Bridge Street	Muswellbrook	Muswellbrook	LGOV
Westpac Bank building	19 Bridge Street	Muswellbrook	Muswellbrook	LGOV
Widden Stud	1650 Widden Valley Road	Widden	Muswellbrook	LGOV
Wollemi National Park	Wollemi	Baerami	Muswellbrook	LGOV
Woodlands Stud	Woodlands Road	Denman	Muswellbrook	GAZ
Woodlands Stud	3933 Woodlands Road	Denman	Muswellbrook	LGOV
Wybong Cemetery	Yarraman Road	Wybong	Muswellbrook	LGOV
Yammanie	307 Denman Road	Muswellbrook	Muswellbrook	LGOV
Yarrawa Bridge over Goulburn River	Yarrawa Road	Denman	Muswellbrook	SGOV
Yarrawa Bridge over Hunter River	Yarrawa Road	Denman	Muswellbrook	LGOV

There was a total of 213 records matching your search criteria.

Key:
LGA = Local Government Area
GAZ= NSW Government Gazette (statutory listings prior to 1997), HGA = Heritage Grant Application, HS = Heritage Study, LGOV = Local Government, SGOV = State Government Agency.
Note: While the Heritage Division seeks to keep the Inventory up to date, it is reliant on State agencies and local councils to provide their data. Always check with the relevant State agency or local council for the most up-to-date information.

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : 17-420

Client Service ID : 300921

NGH Environmental - Newcastle

7/11 Union St
Newcastle West New South Wales 2302

Attention: Lauren Byrne

Email: lauren.b@nghenvironmental.com.au

Date: 12 September 2017

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -32.3426, 150.93 - Lat, Long To : -32.3425, 150.9301 with a Buffer of 1000 meters, conducted by Lauren Byrne on 12 September 2017.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

7	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (http://www.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date .Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

3 Marist Place, Parramatta NSW 2150
Locked Bag 5020 Parramatta NSW 2220
Tel: (02) 9585 6380 Fax: (02) 9873 8599

ABN 30 841 387 271
Email: ahims@environment.nsw.gov.au
Web: www.environment.nsw.gov.au

APPENDIX D HUNTER ECO ECOLOGICAL REPORT

Malabar Coal
PMB 9 Muswellbrook
NSW 2333

26 October 2018

Rob Hayes
Operations Manager

Dear Rob

This is a brief note describing the vegetation across the proposed solar farm area in Maxwell Infrastructure, which I inspected on 26 and 27 September 2018. This was a cursory inspection with no plot data collected. The proposed solar farm is to be located on approximately 105 hectares (ha) of mine overburden. The attached map shows the location of the proposed solar farm as well as the rehabilitation areas.

The following table shows the areas of vegetation within the solar farm boundary.

Vegetation	Area (ha)
Woodland	21
Pasture	67
Not rehabilitated	17

Woodland in seven fragments consisted of a low canopy primarily of Sugar Gum (*Eucalyptus cladocalyx*), a mid layer of a variety of *Acacia* species, and scattered exotic grass species and herbs.

Pasture in one continuous area was dominated by Rhodes Grass (*Chloris gayana*) and Kikuyu (*Cenchrus clandestinus*) mixed with several weeds such as Galenia (*Galenia pubescens*) and Onion Weed (*Asphodelus fistulosus*).

The vegetation across the proposed solar farm area is primarily exotic and does not represent any plant community type (PCT) listed in the NSW Vegetation information System (VIS) data base (https://www.environment.nsw.gov.au/research/Visclassification.htm).
The NSW Biodiversity Assessment Method (BAM) specifically excludes the use of the credit calculator for assessing vegetation integrity of non-natural vegetation.

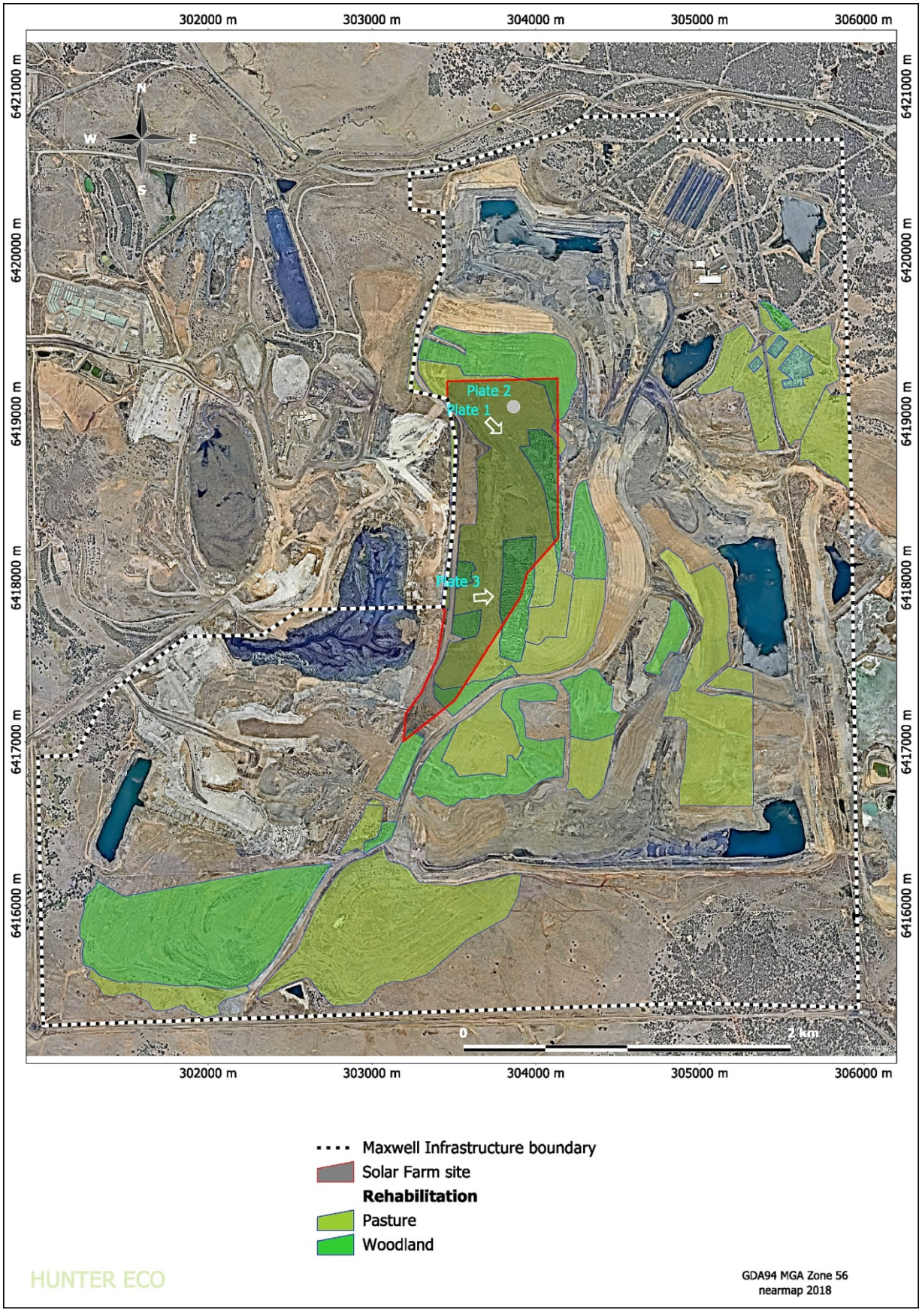
Despite the solar farm vegetation being predominantly exotic it does have the potential to provide habitat for threatened fauna species, in particular birds. The pasture and woodland could provide foraging habitat for the Square-tailed Kite (recorded in the Maxwell EL) or Little Eagle, and the woodland could provide habitat for small woodland birds such as Diamond Firetail, Hooded Robin, Scarlet Robin or Flame Robin.

At present there is not a clear path for assessing offset requirements for exotic habitat under the BAM.

Yours Faithfully
HUNTER ECO

Dr Colin Driscoll

HUNTER ECO · ABN 25 112 984 240
PO Box 1047, Toronto, NSW 2283 **Phone/Fax** +61 2 4959 8016 **Mobile** 0438 773 029 **Email** cd_enviro@bigpond.com



HUNTER ECO · ABN 25 112 984 240
PO Box 1047, Toronto, NSW 2283 **Phone/Fax** +61 2 4959 8016 **Mobile** 0438 773 029 **Email** cd_enviro@bigpond.com

Photographs of the rehabilitation (see the above map for the photo locations)

Plate 1: View from the north-west across predominantly Rhodes Grass pasture with Sugar Gum and *Acacia* woodland rehabilitation in the background.

Plate 2: close-up of pasture with Kikuyu, Rhodes Grass, Onion Weed (white flowers) and Mustard Weed (yellow flowers).

Plate 3: View looking east across predominantly Kikuyu pasture with Sugar Gum and *Acacia* woodland in the background

APPENDIX E AHIMS REGISTERED SITES STATUS

AHIMS Site ID	Site Name	Distance from proposal area	Site Type	Site Status
37-2-1991	DR3 (Drayton Coal)	905m	Artefact	Valid
37-2-2331	Ramrod R13	1005m	Artefact	Valid
37-2-0097	The Pimple; Drayton 3	640m	Open Camp Site	Destroyed
37-2-1974	DR7	1075m	Artefact	Destroyed
37-2-1977	DR10	775m	Artefact	Destroyed
37-2-1978	DR11	800m	Artefact	Destroyed
37-2-1979	DR12	950m	Artefact	Destroyed
37-2-1980	DR13	1035m	Artefact	Destroyed
37-2-1981	DR14	750m	Artefact	Destroyed
37-2-1968	DR.1	505m	Artefact	Destroyed
37-2-1970	DR3	905m	Artefact	Destroyed
37-2-1971	DR4	900m	Artefact	Destroyed
37-2-1972	DR5	1240m	Artefact	Destroyed
37-2-1973	DR6	1175m	Artefact	Destroyed
37-2-1993	DR 5 - Drayton Coal (refer to 37-2-1972)	1240m	Artefact	Deleted
37-2-1994	DR 6 - Drayton Coal (refer to 37-2-1973)	1175m	Artefact	Deleted
37-2-1995	DR 7 - Drayton Coal (refer to 37-2-1974)	1075m	Artefact	Deleted
37-2-1989	DR1 (Drayton Coal)	505m	Artefact	Destroyed
37-2-1992	DR4 Drayton Coal	900m	Artefact	Destroyed
37-2-2341	Ramrod R4	1110m	Artefact + PAD	Destroyed
37-2-2328	Delpah D7	925m	Artefact	Destroyed
37-2-1851	EC1.	1250m	Open Camp Site	Destroyed

AHIMS Site ID	Site Name	Distance from proposal area	Site Type	Site Status
37-2-0027	White's Creek	1680m	Open Camp Site	Destroyed
37-2-0032	Ramrod Creek	1350m	Open Camp Site	Valid
37-2-0167	Bayswater No.2 Colliery Site 7	765m	Open Camp Site	Valid
37-2-0168	Bayswater No.2 Colliery Site 6	1090m	Open Camp Site	Valid
37-2-0170	Bayswater No.2 Colliery Site 4	2030m	Open Camp Site	Valid
37-2-0171	Bayswater No.2 Colliery Site 3	2110m	Open Camp Site	Valid
37-2-1974	DR	1025m	Artefact	Destroyed
37-2-1975	DR8	1400m	Artefact	Destroyed
37-2-1969	DR2	1370m	Artefact	Destroyed
37-2-1970	DR3	1052m	Artefact	Destroyed
37-2-1971	DR4	860m	Artefact	Destroyed
37-2-1973	DR6	1135m	Artefact	Destroyed
37-2-1994	DR6 (37-2-1973)	1200m	Artefact	Deleted
37-2-1995	DR7 (37-2-1974)	1160m	Artefact	Deleted
37-2-1996	DR9 (37-2-1976)	1500m	Shell Midden	Deleted
37-2-1990	DR2 Drayton Coal	1350m	Artefact	Valid
37-2-1991	DR3 Drayton Coal	1010m	Artefact	Valid
37-2-1992	DR4 Drayton Coal	1063m	Artefact	Destroyed
37-2-2006	Ramrod Creek	670m	Artefact	Valid
37-2-2338	Ramrod R1	108m	Artefact	Valid
37-2-2339	Ramrod R2	170m	Artefact	Valid
37-2-2340	Ramrod R3	202m	Artefact; PAD	Valid
37-2-2341	Ramrod R4	150m	Artefact; PAD	Destroyed
37-2-2342	Ramrod R5	1110m	Artefact	Valid

AHIMS Site ID	Site Name	Distance from proposal area	Site Type	Site Status
37-2-2343	Ramrod R6	1150m	Artefact	Valid
37-2-2344	Ramrod R7	1520m	Artefact	Destroyed
37-2-2345	Ramrod R8	1910m	Artefact	Valid
37-2-2346	Ramrod R9	1900m	Artefact	Valid
37-2-2347	Ramrod R10	980m	Artefact; PAD	Valid
37-2-2323	Ramrod 16	817m	Artefact	Valid
37-2-2324	Ramrod 17	815m	Artefact	Valid
37-2-2329	Ramrod 11	1350m	Artefact	Destroyed
37-2-2330	Ramrod R12	1250m	Artefact	Valid
37-2-2331	Ramrod R13	553m	Artefact	Valid
37-2-2332	Ramrod R14	930m	Artefact	Valid
37-2-2333	Ramrod R15	825m	Artefact	Valid
37-2-1820	RP77	1835m	Artefact	Valid
37-2-1850	RL4	125m	Open Camp Site	Destroyed
37-2-1851	EC1	935m	Open Camp Site	Destroyed
37-2-1852	IS5	1950m	Open Camp Site	Destroyed
37-2-1821	RP82	1745m	Open Camp Site	Valid
37-2-1822	RP84	1570m	Open Camp Site	Valid
37-2-1823	RP86	2000m	Open Camp Site	Valid
37-2-1824	RP94	1750m	Open Camp Site	Valid
37-2-1825	RP98	1360m	Open Camp Site	Valid
37-2-1818	RP70	2209m	Open Camp Site	Valid
37-2-1819	RP76	1975m	Open Camp Site	Valid
37-2-4167	MAC31	1480m	Artefact	Valid
37-2-4168	MAC32	1850m	Artefact	Valid
37-2-4201	MAC65	2150m	Artefact	Valid

AHIMS Site ID	Site Name	Distance from proposal area	Site Type	Site Status
37-2-4202	MAC66	1995m	Artefact	Valid
37-2-4203	MAC67	2094m	Artefact	Valid
37-2-4204	MAC68	2185m	Artefact	Valid