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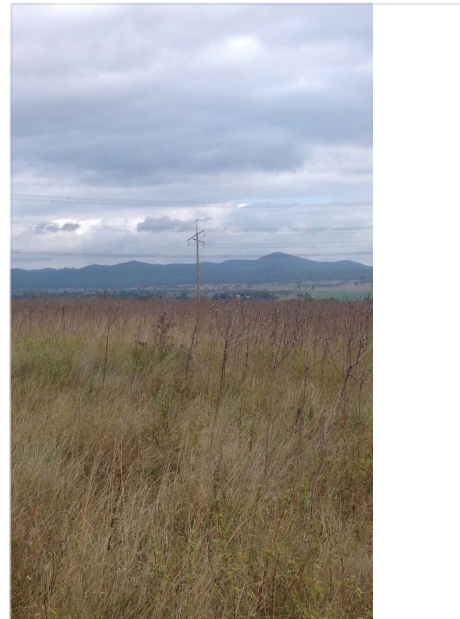


Scoping Report

Hunter River Solar Farm

March 2022

Project Number: 20-838



Document verification

Project Title:	Hunter River Solar Farm
Project Number:	20-838
Project File Name:	20-838 HRSF scoping report final 1.2

Revision	Date	Prepared by	Reviewed by	Approved by
Final v1.0	2/12/2021	Ainslee Roser	Zeina Jokadar	Zeina Jokadar
Final v1.1	16/12/2021	Ainslee Roser	Zeina Jokadar	Zeina Jokadar
Final v1.2	7/03/2022	Zeina Jokadar	Les Seddon Brooke Marshall	Zeina Jokadar

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ABN 31 124 444 622 ACN 124 444 622

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Acronyms and abbreviations

ABS	Australian Bureau of Statistics
AC	Alternating Current
ACHA	Aboriginal Cultural Heritage Assessment
AHIMS	Aboriginal Heritage Information Management System
BAM	Biodiversity Assessment Method
BC Act	<i>Biodiversity Conservation Act 2016</i> (NSW)
BCD	Biodiversity Conservation Division
BDAR	Biodiversity Development Assessment Report
BESS	Battery Energy Storage System
Biosecurity Act	<i>Biosecurity Act 2015</i> (NSW)
BOM	Australian Bureau of Meteorology
BOS	Biodiversity Offsets Scheme
BPL	Bushfire Prone Land
BSAL	Biophysical Strategic Agricultural Land
CIC	Critical Industry Cluster
CIV	Capital Investment Value
Council	Muswellbrook Shire Council
Cwth	Commonwealth
DAWE	Department of Agriculture, Water and the Environment (Cwth) (formerly DoEE)
DECCW	(Former) Department of Environment, Climate Change and Water (NSW) (now EES)
DoEE	(Former) Department of the Environment and Energy (Cwth) (now DAWE)
DPE	Department of Planning and Environment (NSW) (formerly DPIE)
DPIE	Department of Planning, Industry and Environment (NSW)
DC	Direct Current
EEC	Endangered ecological community – as defined under relevant law applying to the Project
EES	Department of Environment, Energy and Science (NSW) (formerly OEH, and, prior, DECCW)
EIA	Environmental impact assessment
EIS	Environmental impact statement

EMF	Electric and magnetic fields
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwth)
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW)
ESD	Ecologically Sustainable Development
FM Act	<i>Fisheries Management Act 1994</i> (NSW)
ha	hectares
Heritage Act	<i>Heritage Act 1977</i> (NSW)
GHG	Greenhouse gas
HML	Higher mass limit
HRSF	Hunter River Solar Farm
HVC	High voltage connection
IPC	Independent Planning Commission of NSW
KFH	Key Fish Habitat
km	kilometres
kV	Kilovolt
kVA	Kilovolt-ampere
LALC	Local Aboriginal Land Council
LEP	Local Environment Plan
LGA	Local Government Area
LSC	Land and soil capability
LUCRA	Land Use Conflict Risk Assessment
m	metres
MNES	Matters of National Environmental Significance under the EPBC Act (<i>c.f.</i>)
MLRA	Multi-level Risk Assessment
MW	Megawatt
MWh	Megawatt (hour)
MW(AC)	Megawatt alternating current
NPW Act	<i>National Parks and Wildlife Act 1974</i> (NSW)
NV Act	<i>Native Vegetation Act 2003</i> (NSW)
OEH	(Former) Office of Environment and Heritage (NSW) (now EES)
OSOM	Oversize/over mass
PBP	Planning for Bushfire Protection
PCT	Plant Community Type
PHA	Preliminary Hazard Analysis

PMST	Protected Matters Search Tool
PV	Photovoltaic
RAV	Restricted access vehicle
REF	Review of Environmental Factors
RET	Renewable Energy Target
REZ	Renewable Energy Zones
RFS	Rural Fire Service
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SoHI	Statement of Heritage Impact
SSD	State Significant Development
TEC	Threatened Ecological Community
TfNSW	Transport for NSW
TISEPP	State Environmental Planning Policy (Transport and Infrastructure) 2021 (NSW)

Terminology used in this report

Project	The construction and operation of the Hunter River Solar Farm (HRSF) and associated ancillary infrastructure. The HRSF would have a total generation capacity of 84 MW _p DC/ 60 MW AC.
Proponent	BayWa r.e. Projects Australia Pty Ltd
Project site	The area of land that is being investigated for siting of the Project. This land would include all lots, Crown land, Crown waterways, Crown roads and Council roads affected by the Project.
Development footprint (Indicative only)	The Development footprint for the Project would be established within the Project site subject to consideration of constraints and infrastructure siting throughout design. The Development footprint is the area of land that would be directly impacted by the Project (construction and operation, including all temporary and permanent impacts). It will be refined subject to more detailed investigation.
Locality	The broader area considered by this preliminary assessment, incorporating a 10km buffer of the Project site.

Purpose of the scoping report

A Scoping Report is a publicly available document which provides preliminary information on a project and its potential impacts, used to support a request for Secretary's Environmental Assessment Requirements (SEARs) from the New South Wales Department of Planning and Environment (DPE).

Scoping is the first phase in the Environmental Impact Assessment (EIA) of State Significant Development (SSD) projects. Scoping identifies the matters and impacts that are likely to be relevant and establishes terms of reference for the Environmental Impact Statement (EIS).

The scoping phase is critical to steering the remainder of EIA. When effectively carried out, scoping highlights the relevant matters and impacts to be considered in the EIS and the appropriate level of assessment to occur. It results in SEARs that provide clear direction to the proponent on what needs to be assessed, how it should be assessed and to what level of detail.

Feedback from the community and other stakeholders is important during the scoping phase in helping shape the Project. The Scoping Report documents early consultation that has been undertaken and allows the community and stakeholders to see the preliminary details of the project at this point. Further feedback will be sought to shape the Project via a formal community engagement process (further details provided in section 5).

1. Introduction

BayWa r.e. Projects Australia Pty Ltd. is proposing to develop the Hunter River Solar Farm (HR SF), a photovoltaic (PV) solar farm with nominal generation capacity of 84 MW_p DC / 60 MWAC and Battery Energy Storage System (BESS) (the Project) near the town of Denman within the Muswellbrook Shire Local Government Area (LGA). The Project's locality is shown in Figure 2-1. The Project's objectives centre on the development of a viable and acceptable renewable energy generation facility that will provide a meaningful contribution to the state's transition to renewable energy technologies. The current proposed location and generation capacity of the Project has been based on a high-level consideration of proximity to the grid, capacity of the grid, availability of suitable land, developability of the site and high level consultation with associated landowners and local agencies. The current layout and generation capacity of the Project is indicative only, and the design is expected to evolve through the course of consultation and specialist investigations, in order to avoid and minimise environmental and social impacts.

This Scoping Report has been prepared to support a request to the Department of Planning, and Environment (DPE) for the Secretary's Environmental Assessment Requirements (SEARs) in relation to the Project. The SEARs would guide the preparation of an Environmental Impact Statement (EIS) for the Project, pursuant to Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). An EIS is required as the proposal has a capital investment value exceeding \$30 million and is therefore classed as State Significant Development.

This Scoping Report provides a description of the Project, including the site and its surroundings, the environmental planning pathway for approval and identification of key potential environmental issues that may be associated with the Project and proposed strategies for their investigation. It includes the results of early community engagement activities. It has been prepared in accordance with the *State significant development guidelines – preparing a scoping report* (DPIE, 2021).

1.1 The Proponent

BayWa r.e. is a leading global renewable energy developer, service provider, distributor and energy solutions provider. Founded in February 2009 and currently employing approximately 3,000 employees globally, a presence in Australia was established in 2017. BayWa r.e. has realised over 4 GW of solar and wind Projects globally with 16 GW of Projects currently under development.

Table 1-1 Summary of Proponent details

Company name	BayWa r.e. Australia Pty Ltd
ABN	51 606 343 757
Address	45 Denison Street, Bondi Junction, 2022 NSW

2. Strategic context

2.1 Site context

2.1.1 Regional context

The Project is located within the Muswellbrook Shire LGA, which covers 3,402km², and is centrally located in the Upper Hunter Valley approximately 130km north-west of Newcastle. Lake Liddell delineates the Muswellbrook Shire boundaries to the east, Wollemi National Park to the west, Aberdeen to the north and Coricudgy State Forest to the south (Muswellbrook Shire Council, 2021). The site sits within the Wanaruah Local Aboriginal Land Council (LALC) area, and the traditional owners of the land are the Gamilaraay people.

Denman, located approximately 7km southwest of the Project site, is the closest town with a population of 1,789 (Australian Bureau of Statistics, 2016). Denman has RFS and SES facilities, sporting fields, community hall and various cafes and local shops. The region benefits from the surrounding vineyards, bringing tourists to the town, as well as surrounding mines providing employment opportunities. Singleton, located approximately 52km south of the Project site is the closest major regional centre with a population of approximately 22,987 (ABS, 2021) in the urban suburbs. Singleton has many public services and community facilities including a public and private hospital, banks, retail outlets, grocery stores, public and private schools, accommodation facilities including motels, caravan parks and short-term rentals.

2.1.2 Project site

The Project sits across Lot 11 DP215827 and Lot 12 DP215827 and covers approximately 110 hectares (ha) as shown in Figure 2-2. The Project site is zoned RU1 (Primary Production) under the Muswellbrook Local Environmental Plan (LEP). The site is predominantly used for cattle grazing, with a small portion (the northernmost paddock) being used for agricultural production on a rotational basis. One residential dwelling and sheds are present on site.

The surrounding properties' main land use is agricultural production also zoned as RU1 – Primary Production. The Hunter River is approximately 700 metres north-west of the Project site. There are six residential dwellings within 1 km of the Project site, with one associated receiver and five non-associated receivers.

Access to the Project site would be from Denman Road with vehicles either coming from Denman or Muswellbrook approximately 12 km northeast of the site.

An existing power line runs approximately 30 metres east of the existing access road from Denman Road to the house, supplying electricity. Two 66 kV Ausgrid powerlines run parallel to Denman Road, one of which passes through the site. These powerlines connect Denman Zone Substation with the Mitchell Line Sub-Transmission Substation. A 500 kV TransGrid powerline passes through the south-west corner of the site, connecting Bayswater with Wollar and Bannaby.

There are remnant scattered trees in the Project site with most of the Project site representing a modified landscape. There are five dams located within the Project site.

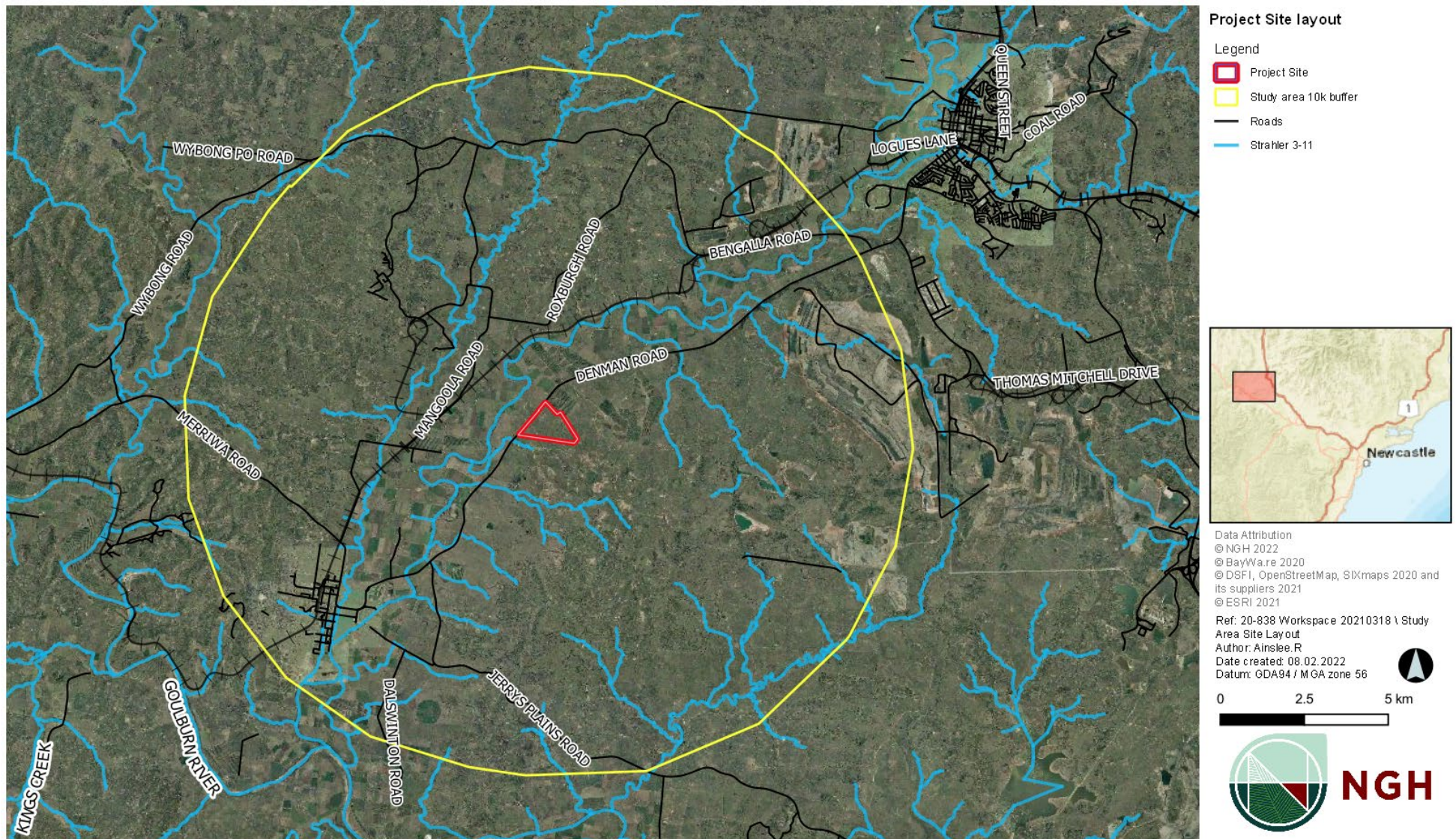


Figure 2-1 Locality around the Project site

Scoping Report Hunter River Solar Farm

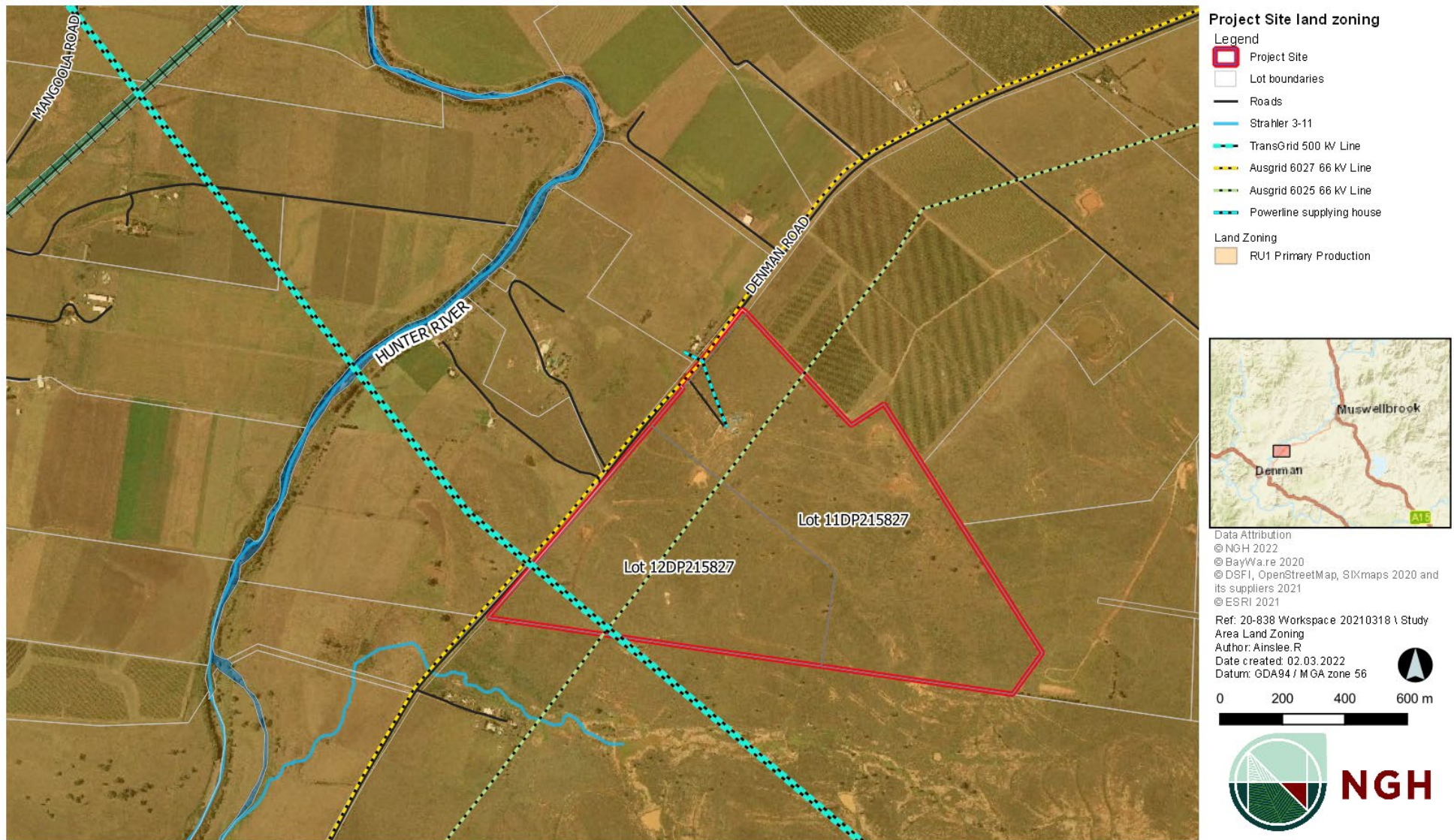


Figure 2-2 Land zoning and Lot/DPs associated with the Project site

2.2 Strategic need

This section highlights the need that the national and NSW electricity market has for new generation capacity. It also outlines how the Project contributes to local, state and federal government objectives in relation to renewable energy and climate change policy.

In short, the NSW market needs electricity as ageing coal-fired power stations reach the end of their operational life. The Australian Energy Market Operator (AEMO) has forecast that all five coal-fired power stations in NSW are expected to retire by 2035 (AEMO, 2020). This is equivalent to 9,000MW of generation capacity or approximately 75% of electricity supply in NSW. The scheduled retirement of Liddell in 2022-2023 means the NSW electricity market has an immediate need for new generation to bridge this gap.

More recently the AEMO has indicated in the Draft 2022 Integrated System Plan (Draft ISP) (AEMO December 2021) that nationally, coal is retiring at two to three times faster than anticipated. This excludes the February 2022 announcement by Origin Energy, that they are seeking permission to bring forward the shutdown of Eraring Power Station by seven years to 2025. These closures suggest that 5GW of the current 23GW coal capacity will be withdrawn by 2030. The Draft ISP forecasts faster withdrawals across all scenarios, in particular the suggested most likely Step Change scenario indicates 14GW of coal capacity may be withdrawn by 2030.

2.2.1 Alignment with strategic planning frameworks

International

In December 2015, Australia, among another 194 countries, agreed on the United Nations Paris Agreement on climate change. The following are key objectives of the agreement:

- a goal to limit the increase in global temperatures to well below 2 degrees and pursue efforts to limit the rise to 1.5 degrees
- a commitment to achieve net-zero emissions, globally, by the second half of the century
- differentiated expectations for developed nations, including Australia, that they will reduce their emissions sooner than developing nations.

As a signatory to the agreement, the Australian Government has committed to reduce greenhouse gas emissions by 26-28 % on 2005 levels by 2030.

Electricity generation is one of the largest individual contributors of greenhouse gas emissions in Australia, representing 33.4 % of emissions in the year up to September 2020 (DoSER, 2020).

The development of renewable energy Projects is considered to be one of the most effective ways to meet the nation's international commitments to reduce greenhouse gas emissions and the Project would contribute to Australia's effort to meet the Paris Agreement.

National

Renewable Energy Target

The Renewable Energy Target (RET) is an Australian Government scheme designed to reduce emissions of greenhouse gases in the electricity sector and encourage additional generation of electricity from sustainable and renewable sources. The Clean Energy Regulator (CER)

administers both the small and large-scale RET schemes. The Large-scale RET scheme incentivises investment in renewable energy power stations such as wind and solar farms. The Large-scale RET of 33,000 gigawatt hours of additional renewable electricity generation was met at the end of January 2021 (Clean Energy Regulator 2021). Whilst the annual target will remain at 33,000 gigawatt hours until the scheme ends in 2030, the CER Regulator expects large-scale renewable generation could reach up to 40,000 gigawatt hours in 2021.

The Project would support long term and stable energy policies such as the Renewable Energy Target (RET). Additionally, large-scale solar farm projects such as this provide an alternative power generation source resulting in the potential to benefit the Australian community by reducing average household electricity bills and power disruptions.

Specific to Australia's commitments, the Project would provide the following benefits:

- Reduced greenhouse gas (GHG) emissions, contributing to meeting our international climate commitments.
- Aid the transition towards cleaner electricity generation.
- Direct contribution to help in meeting the RET.

Integrated System Plan 2020

The Integrated Systems Plan 2020 prepared by the AEMO is an “actionable roadmap for eastern Australia’s power system to optimise consumer benefits through a transition period of great complexity and uncertainty.” A Draft 2022 Integrated System Plan (ISP) was published on 10 December 2021.

Renewable Energy Zones (REZ) are identified in the ISP 2020 as areas where “clusters of large-scale renewable energy can be developed to promote economies of scale in high quality areas and capture geographical and technological diversity in renewable resources” (AEMO, 2020).

The Project is located within the proposed Hunter-Central Coast REZ, identified in the ISP and supported by a future ISP project, Hunter-Central Coast REZ network expansion, to connect the renewable generation to the load centre.

NSW context

Electricity policy

The NSW Government has released various policy documents since 2018, with the common objective of delivering cheaper, cleaner and more reliable electricity to support future growth. These include:

- NSW Transmission Infrastructure Strategy (DPE, 2018)
- NSW Electricity Strategy (DPIE, 2019)
- NSW Electricity Infrastructure Roadmap (DPIE, 2020)

As highlighted in the NSW Electricity Infrastructure Roadmap (the Roadmap):

NSW is at a crossroads. As our existing power sources come to the end of their lives and global markets seek cleaner, cheaper and more reliable energy sources, we have a once in a generation opportunity to redefine the State as a modern, global energy superpower

The Transmission Infrastructure Strategy and the Roadmap both consider the establishment of REZ a key part of delivering against these objectives. Although five zones have been identified, the priority zones for development are in the Central-West, New England and South-West regions of

NSW. As highlighted in the Transmission Infrastructure Strategy (DPE 2018), these zones have been selected in areas with energy resource potential, reduced land use constraints and where planned transmission upgrades can lower the cost of connection across multiple projects.

The Project is likely to be located in the proposed Hunter-Central Coast REZ. The Hunter-Central Coast REZ has two main objectives. The first is to connect multiple renewable energy generators and storage projects (such as batteries and pumped hydro) that can support system reliability as the state's ageing coal-fired power stations retire. The second is to provide cheap, reliable and clean electricity to homes, businesses and industry in the Hunter and Central Coast regions and beyond. The Energy Corporation of NSW (Energy Corporation) is a Government-controlled statutory authority which will lead the delivery of NSW REZs. To help inform the timing, capacity, design and location of the Hunter-Central Coast REZ, EnergyCo NSW is conducting a Registration of Interest (ROI) to seek information from energy project developers and businesses with new large electrical loads and existing large electrical loads (NSW Government, 2022).

The Project would be beneficial to the Roadmap enabled under the *Electricity Infrastructure Investment Act 2020* to provide affordable, clean and reliable energy (NSW Government, 2021). It will generate and store clean energy to be fed into the electricity grid servicing the Hunter region, prioritised by the Roadmap to support 8000 MW of new transmission capacity.

In December 2020, the NSW Electricity Infrastructure Investment Act was enacted into law with bi-partisan support. Together with the Roadmap, this legislation is intended to:

- attract up to \$32 billion in private investment for regional energy infrastructure by 2030
- support 6,300 construction jobs and 2800 ongoing jobs, mostly in regional NSW
- save around \$130 a year on the average NSW household electricity bill
- help reduce NSW electricity emissions by 90 million tonnes by 2030.

With an anticipated capital cost of approximately \$92 million, and the potential to create up to 25 full time equivalent (FTE) jobs during construction, and up to 4 FTE jobs during operations, the Project would contribute to realising these aspirations.

Climate change policy

The NSW Climate Change Policy Framework was introduced in 2016, with an aspirational long-term objective of achieving net zero emissions by 2050. The NSW Renewable Energy Action Plan was also introduced in 2016, and the Project is consistent with the three goals of the plan which are:

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

In March 2020, the NSW State Government also introduced the Net Zero Plan Stage 1: 2020-2030, and this was updated in September 2021. The updated plan sets an interim target of reducing emissions by 50% by 2030 (when compared to 2005 levels).

The Project would generate up to 735 GWh per year, saving approximately 521,000 tonnes of carbon dioxide per year when compared to typical fossil fuel electricity generation in Australia, and contribute to the achievement of this target.

The Project is also consistent with the current goals and targets for renewable energy generation in NSW. These include:

- Contributing to growing the economy, creating jobs and reducing emission over the next decade in line with the Governments Net Zero Plan Stage 1: 2020 - 2030 grow the economy, create jobs and reduce emissions between 2020 – 2030.
- Goal 22 of the NSW 2021: A plan to Make NSW Number One (Department of Premier and Cabinet, 2011):
 - Contribute to the national renewable energy target [i.e. 20% renewable energy supply] by promoting energy security through a more diverse energy mix, reducing coal dependence, increasing energy efficiency and moving to lower emission energy sources.
- Contributing to achieving the NSW target of zero net emissions by 2050.
- Consistent with the NSW Electricity Strategy (NSW Government, 2019), that outlines the NSW Governments plan for reliable, affordable and sustainable electricity.

2.3 Project benefits

As well as providing a meaningful contribution to the state and federal renewable energy targets and initiatives, the Project would create local employment and economic stimulus in the Muswellbrook area. It would include benefit sharing to ensure the benefits are spread equitably. It would have a real impact on the local community through contributions to the local council and through its beneficial impact on lowering electricity prices and stabilising the supply of electricity as the grid transitions to more renewable generation sources.

During construction, approximately 150 - 200 jobs would be created along with an additional 3 - 4 full time equivalent jobs during operation. Townships in the area would provide accommodation, food, fuel and trade equipment and services, mostly during the construction phase. During the 50-year operation of the solar farm, economic benefits would come from monitoring and inspections, maintenance, repair and upgrade of infrastructure.

Benefit sharing schemes and agreements between BayWa r.e will be explored throughout the community engagement process to enable the distribution of benefits generated by the Project to the community. To date the BayWa r.e has offered a \$5,000 contribution towards a roof-top solar system to dwellings within 1km of the Project site. Additionally, where requested to mitigate visual impacts, the proponent is offering on-site landscaping for any dwellings within 1 km of the Project site.

Additionally, the NSW Government has recently exhibited reforms to the contributions system that introduce Section 7.12 levy rates for solar energy projects (\$2,000 per megawatt of generating capacity up to a maximum of \$450,000). These levies are one of the mechanisms, along with Voluntary Planning Agreements (VPAs), that are available to councils to collect contributions towards infrastructure (DPIE, 2021 a).

Renewable energy contributed 27.7 % of Australia's total electricity generation in 2020, an increase of 3.7% on 2019. Small-scale solar added more than 3 GW of new capacity, and large-scale solar contributed almost 2 GW of new capacity in 2020. Seventy six (76) large-scale wind and solar projects were under construction at the end of 2020, representing more than 8 GW of new capacity and employing over 9,000 Australian workers (CEC, 2021).

While most of Australia's electricity is currently provided by coal-fired power stations, as many as three-quarters of these plants are operating beyond their original design life (DIS, 2015). Nine coal-fired power stations have closed since 2011-2012, representing around 3,600 MW of installed capacity (Commonwealth of Australia, 2016). The reduction in energy supply from coal-fired power

stations requires the development of reliable and sustainable energy supply. Large-scale solar farm projects such as this provide an alternative power generation source.

Large-scale solar farm projects also have potential to benefit the Australian community by reducing average household electricity bills and power disruptions. The Australian Electricity Market Commission (AEMC) predicts residential electricity prices will fall 7.1% on average between 2019 and 2022, a reduction primarily driven by an 11.6% reduction in wholesale prices as 8,594 MW of new, mostly renewable energy comes online (CEC, 2021). The commissioning of new renewable energy facilities will increase competition in wholesale energy market and, as with any market, increased competition will tend to reduce prices. Photovoltaic solar farms operate with no fuel costs and can, with the correct policy framework, be used to reduce the overall wholesale prices of electricity. Both the Commonwealth and State Governments have established frameworks to support this objective.

Furthermore, the Project includes a battery energy storage system (BESS) of up to 60 MW(AC). Along with renewable generation and poles and wires, battery storage is considered a key component of supporting the transition to renewable energy generation; turning our Renewable Energy Zones (REZs) into modern day power stations.

2.4 Site selection and suitability

The *Large-Scale Solar Energy Guidelines for State Significant Development 2018* notes the importance of demonstrating the suitability of the selected solar farm location and outlines key constraints that should be identified and considered. This process allows the opportunity to avoid or minimise negative impacts at the outset. Design and assessment of the Project can then be undertaken with a focus on mitigating and managing unavoidable impacts.

The Muswellbrook region is suitable for solar generation due to its sunny location and the regional capacity to connect to the existing transmission network. There is one 330kV line that traverse through the region (Muswellbrook to Tamworth) that is part of the major network connection between NSW and Queensland. Muswellbrook also has a 330kV Substation (TransGrid, 2020).

There is one distribution powerline, two sub-transmission powerlines and one transmission powerline passing through the Project site. The nearest operating Solar Facility is the Liddell Solar Thermal Facility owned by AGL which is a 9.3MW solar farm with energy storage and associated infrastructure. The Liddell Solar Thermal is 40km east of Denman.

The Hunter River solar farm site was chosen on the basis of topography, land size, amenity, transmission connectivity and landowner interest. The site is located in a rural area with few receivers within 1km of the Project site. The mitigation of visual impacts will remain an important consideration throughout the assessment process and community consultation period, with feedback to be integrated into the detailed design of the Project and the EIS, allowing for a development that can mitigate any potential impacts on nearby receivers.

Denman Road has connections to other major transport routes such as the New England Highway and Golden Highway (Jerrys Plains Road). Table 2-1 and Table 2-2 outline the suitability of the Project site for the proposed solar farm and summarise why the site was ultimately chosen.

Table 2-1 Site selection criteria: preferable site conditions.

Preferable site condition	Applicability to the Project
Optimal solar resources	The Muswellbrook (Lindisfarne) weather station (located approximately 10 km from Denman shows good solar irradiance, with a daily average irradiance of 4.9 kWh m ⁻² on an annual basis since 1990 (Bureau of Meteorology, 2021).
Suitable land	Suitable land characteristics of the Project site include: • Approximately a 6% typical gradient dominated by grazing native vegetation, slightly north sloping for ideal solar resource • The site has already been cleared and heavily disturbed by agricultural activities. • The site is owned by one landowner. • There is no Crown Land within the Project site • No permanent watercourses run through the Project site • The site is not within a flood planning area • The site is not mapped as bushfire prone land • Few non associated residential receivers are located within 1km of the Project site
Local impacts minimised	Early community engagement is currently underway to enable the Project to reflect community issues and the results to date are summarised in section 5. This early consultation identified visual impact as a concern for some stakeholders. Measures such as compensation and vegetation screening were discussed and positively received by stakeholders that have potential to be directly impacted by the Project. As such stakeholders are seen as likely to be responsive to mitigation measures to lessen specific impacts determined through subsequent detailed assessments. While there are a small number of immediate neighbours, due to the topography of the site and locality there is potential for residences further afield to be impacted. This would be determined through a specialist visual impact assessment undertaken in accordance with the draft <i>Visual Assessment Framework for Large-Scale Solar Energy Development</i>. This standardised assessment methodology now addresses elevated view potential explicitly. One stakeholder was also concerned with solar farms utilising prime agricultural land previously used for vineyards. An Agriculture Impact Assessment and soil surveys will be undertaken, and the level of the assessment will be based on the extent of high or moderate land soil capability, Biophysical Strategic Agricultural Land (BSAL) and Critical Industry Cluster (CIC) within the Project site. There are minimal receivers within 1km of the Project site (five non-associated) who may be impacted by construction noise. Due to this relatively low number, mitigating any potential noise impacts is predicted to be manageable.

Preferable site condition	Applicability to the Project
Capacity to rehabilitate	Piled array supports are proposed, resulting in minimal ground disturbance. Cable laying will require excavation of trenches resulting in short term ground disturbance. Geotechnical studies will confirm the installation method. Concrete footings for buildings, batteries and inverters will be discrete in area and make up a very small overall impact area. Once the solar farm reaches the end of its operational life, the site can be remediated to its existing condition so that grazing and occasional cropping can be resumed.
Proximity to electrical network	There is one 330kV line that traverses through the region (Muswellbrook to Tamworth) that is part of the major network connection between NSW and Queensland. Muswellbrook also has a 330kV Substation (TransGrid, 2020).
Connection capacity	There is one distribution powerline, two Ausgrid 66 kV sub-transmission powerlines and one transmission powerline passing through the Project site. The proposed connecting powerline is expected to have sufficient thermal capacity to carry up to a 60 MW AC output from the solar farm. The connection point would be on the 66kV feeder 6027 (more detail is provided in section 2.4.1).

Table 2-2 Site selection criteria: areas of constraint.

Areas of constraint	Applicability to the Project
Native vegetation	The Project site contains 94% of Category 2 land and small areas of <i>TEC Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion (Hunter Valley Footslopes Woodland)</i> , listed as Vulnerable under the BC Act. However, the Project site is not considered highly constrained due to historical clearing; canopy cover is very sparse.
Potential residences	There are 61 potential sensitive receivers within 5km of the Project site including six within 1km. Of the six, one is an associated receiver (Figure 6-5). As well as close proximity views, elevated views will be considered in more detail as the assessment continues. Visual amenity is considered in section 6.3 and noise and vibration are considered in section 6.4.
Waterways	The Hunter River is located approximately 700m north-west of the Project site. No permanent named watercourses run through the Project site. No flood mapping is relevant to the site. One groundwater bore (GW201144) is located within the Development footprint (Figure 7-1).

Areas of constraint	Applicability to the Project
	Hydrology and groundwater are considered in section 6.11.
Aboriginal/Heritage significance	An extensive AHIMS search was undertaken and identified no registered sites within the Project site, however 11 sites were identified within one kilometre of Lot 11 DP215827. No sensitive landscape features are known to occur onsite. No non-indigenous heritage items have been recorded within the Project site, however one state listed heritage place is located adjacent to the Project site at 1532-1618 Denman Road, Denman. Aboriginal heritage is considered in Section 6.7 and non-indigenous heritage is considered in Section 6.11.
Important agricultural land	BSAL mapping for the Upper Hunter Region shows a small part (about 3%) of the Project site is mapped within a BSAL area. CIC for Viticulture and Equine occur across portions of the Project site. If Class 3 LSC, BSAL and CIC is confirmed to be present within the Development footprint, then a detailed assessment which considers siting options to remove any BSAL, CIC and class 3 LSC land from the development footprint would be undertaken. Soils and Landforms are considered in Section 6.6
Residential zones	No residential zones are associated with the Project site. The closest residential zone is located within Denman, approximately 7 kilometres south-west of the Project site. Land zoning of the site is RU1 and considered compatible with solar development (refer Section 6.5).
Resource developments	Hunter Valley Energy Coal Pty Ltd hold a coal exploring title (EL5965 (1992 Act)) which intersects the southern portion of Lot 11 DP215827 and Lot 12 DP215827 (Appendix A).

2.4.1 Electrical connection capacity

Consultation with Ausgrid regarding connection to the electricity grid identified the following requirements:

- A high voltage connection (HVC) would be required with a new 66kV switching station including Ausgrid approved 66kV primary equipment.
- New feeder protection to be installed on CB 60272 at Mitchell Line STS ('A' and 'B' 66kV feeder protection), 60340 at Denman ZS ('A' 66kV feeder protection) and the proposed substation
- A single fibre would be provided between the substation and solar farm, and new fibre infrastructure would be constructed to intercept Ausgrid's fibre network.

3. The Project

3.1 Project description

The Project would involve the construction, operation and eventual decommissioning or reconditioning (subject to future approvals) of a photovoltaic (PV) solar facility and associated infrastructure with a capacity of up to 84 MW_p DC / 60 MWAC, including a BESS of up to 60 MW(AC) and 180 MWh. It would supply electricity to the national electricity grid. The indicative Project site is 110ha with the area of solar array and associated infrastructure anticipated to occupy approximately 110ha (termed the Development footprint). Solar farms typically have a Ground Cover Ratio (GCR) of between 30-50%. While the current Development footprint indicated is 110ha, it would be refined during the EIS process. This would include one on-site substation, associated infrastructure and site facilities such as an operations and storage buildings.

The battery energy storage system is proposed in a secure compound within the footprint of the substation (refer to Figure 3-1). The substation location, storage technology, rated capacity (MW) and storage (MWh) would be determined during detailed design. At this stage it is envisaged that the system would utilise lithium-ion batteries up to 60 MW(AC) and 180 MWh.

The Project is likely to include the following infrastructure:

- Up to 18 inverters (typical inverter size being 4200 kVA to 4400 kVA) and up to 18 inverter power stations.
- Up to 2,500 single axis trackers (typical tracker accommodates approximately 50 to 100 PV modules)
- Up to 200,000 PV modules.
- Up to 60 MW(AC) and X 180 MWh energy storage system
- Substation, associated infrastructure, operations, and storage buildings.
- Underground cabling in trenches.
- Internal access track 4 metres wide, with occasional 6-metre-wide passing bays
- As the solar farm's substation will be on the same parcel as the PV arrays, there is no need for an additional powerline within the existing road easement to connect to an offsite substation.

The grid connection for the solar farm would require a new feeder protection to be installed on AusGrid's CB 60272 at Mitchell Line STS, located to the immediate north of the Project site.

Three site access points from Denman Road are currently under consideration for access to the solar array and substation, as shown in Figure 3 1. The selected access point would be used for both construction and operation.

A preliminary indicative layout is shown in Figure 3-1. Reflecting early constraints investigations it is expected most of the site will prove suitable for development however, this will be informed by community and stakeholder consultation, and detailed site investigations during assessment, planning and design stages. The EIS will assess and seek consent for the broader development footprint to ensure the required design flexibility in detailed design.

The construction phase is expected to take approximately 18 months, with peak construction taking around 9 months. It is anticipated that the HRSF would operate for up to 50 years. Subsequently, the solar farm may be decommissioned if the power output is no longer required, or it may be deemed advantageous to undertake reconditioning of the solar farm. If the decision to

recondition the solar farm was made, this would be subject to relevant government approvals and consents before the reconditioning was undertaken at the end of the initial solar farm's life.

When the site is to be decommissioned, it would involve removal of any obsolete above ground infrastructure except the substation and associated reticulation and return of the site to its existing land capability. Any other infrastructure will be removed based on land use requirements and grid connectivity requirements. The use of piles to support the solar arrays makes decommissioning and land rehabilitation simple and complete.

BayWa r.e. proposes to lease the land required for the solar farm and has a lease agreement with the landowner for up to 50 years if the Project proceeds. The requirement to formalise this via subdivision of the facility from residual agricultural land will be considered.

The capital investment value (CIV) of the Hunter River Solar Farm is approximately \$92 million. A detailed CIV report would be prepared as part of the development application process.

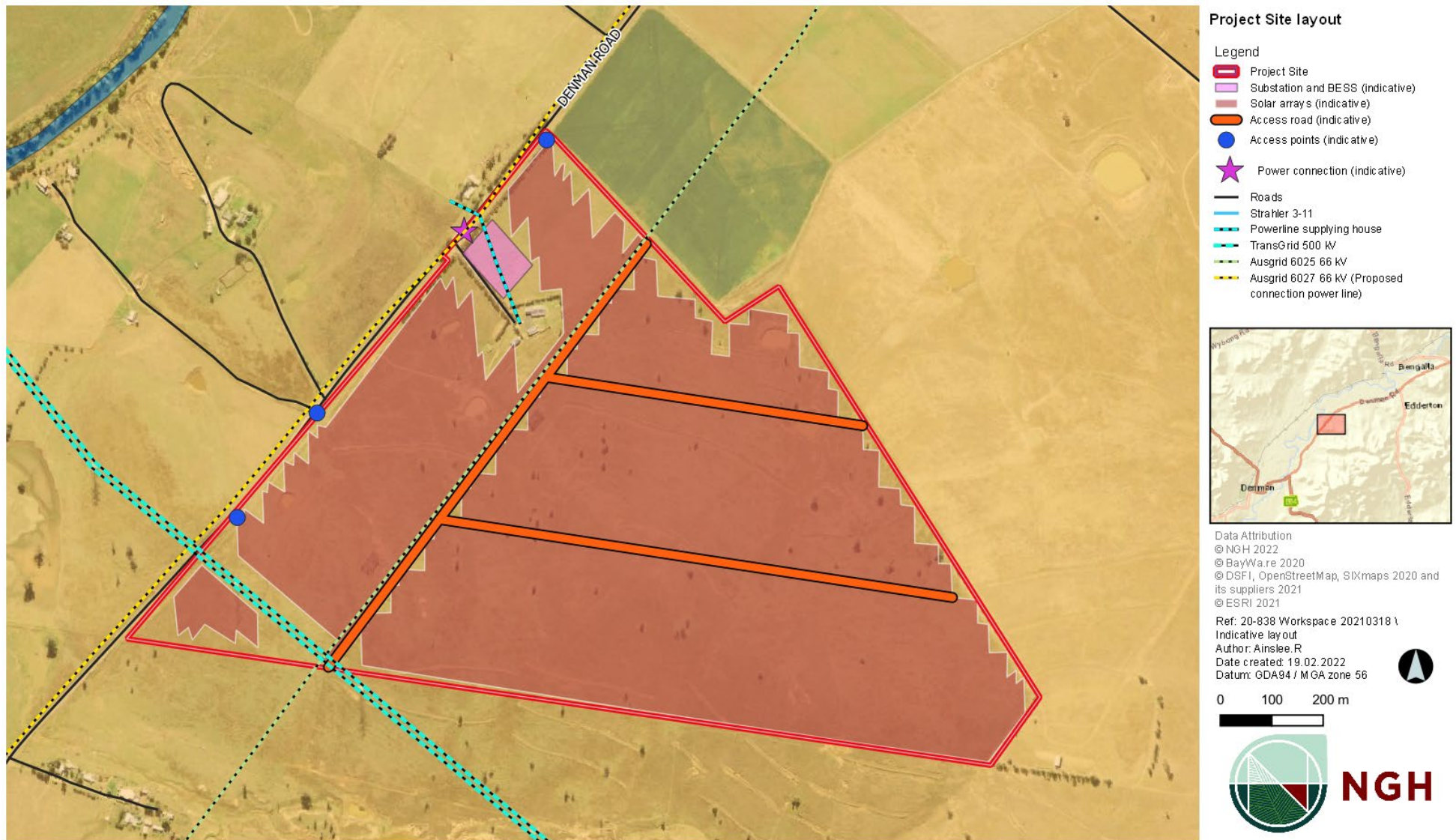


Figure 3-1 Indicative general solar arrangement (Development footprint) within the Project site

4. Statutory context

Category	Statutory requirements	Relevance to Project
Power to grant consent	<i>State Environmental Planning Policy (Planning Systems) 2021</i> (SEPP Planning Systems) Environmental Planning and Assessment Act 1979 (EP&A Act).	Clause 20 of Schedule 1 of the SEPP Planning Systems states that the following is considered a SSD: <i>Development for the purpose of 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:</i> <i>(a) has a capital investment value of more than \$30 million, or</i> <i>(b) has a capital investment value of more than \$10 million and is located in an environmentally sensitive area of State significance.'</i> The Project would have a capital investment cost estimate of more than \$30 million (\$400 million). Therefore, the Project is classified as “State Significant Development” under division 4.7 of the EP&A Act. The Minister for Planning and Public Spaces is the consent authority for SSD, and SSD applications are assessed by DPE (unless specific conditions occur e.g., where 50 or more people have objected to the application, the local council has objected to the application; and/or the applicant has disclosed a reportable political donation, whereby the Independent Planning Commission (IPC) would be the consent authority.
Permissibility	<i>State Environmental Planning Policy (Transport and Infrastructure) 2021</i> (TISEPP), <i>Muswellbrook Local Environmental Plan 2009</i> ((Muswellbrook LEP).	The Project site is subject to the provisions of the Muswellbrook LEP and is zoned RU1 (Primary Production) (Figure 2-2). Electricity generation is prohibited within this land zone, however section 2.36(1b) of the TISEPP states development for the purpose of electricity generating works may be carried out by any person with consent on any land in a prescribed rural, industrial or special use zone. Therefore, the Project is permissible with consent.
Other approvals	<i>Roads Act 1993</i> (Roads Act), <i>Environment</i>	Consistent approvals Section 4.42 of the EP&A Act states “An authorisation of the following kind cannot be refused if it is

Category	Statutory requirements	Relevance to Project
	<i>Protection and Biodiversity Conservation Act 1999 (EPBC Act), Native Title Act 1993, State Environmental Planning Policy (Resilience and Hazards) 2021, Heritage Act 1977, Water Management Act 2000, National Parks and Wildlife Act 1974, Rural Fires Act 1997, Heritage Act 1977</i>	<i>necessary for carrying out State significant development that is authorised by a development consent under this Division and is to be substantially consistent with the consent”:</i> - Consent under section 138 of the Roads Act for road upgrades to the public road network. EPBC Act approval Four Threatened Ecological Communities (TEC) were identified from the Protected Matters Search Tool (PMST). Site surveys identified PCT 1655 - Grey Box - Slaty Box shrub - grass woodland on sandstone slopes of the upper Hunter and Sydney Basin on site which can represent the EPBC listed Central Hunter Valley eucalypt forest and woodland. However, this TEC needs to be over 2ha in size before it can qualify for the EPBC Act listing, which it does not as per section 6.2.5. Other approvals Approvals/licenses that may be required for the Project include: - A preliminary hazard analysis (PHA) under SEPP Resilience and Hazards for energy storage systems. Approvals that would be required were this not an SSD project include: - An approval under Part 4 or a permit under Section 139 of the <i>Heritage Act 1977</i> for excavation works (where required) - An Aboriginal Heritage Impact Permit (AHIP) under Section 90 of the <i>National Parks and Wildlife Act 1974</i> - A bush fire safety authority under section 100B of the <i>Rural Fires Act 1997</i> - A water management work approval under section 90 of the <i>Water Management Act 2000</i>.
Pre-condition to exercising the power to grant consent	N/A	No pre-conditions to exercising the power to grant approval have been identified for the Project.
Mandatory matters for consideration		The following key Commonwealth, State and Local legislative and policy instruments are applicable to the Project: <u>Commonwealth</u>

Category	Statutory requirements	Relevance to Project
		• EPBC Act • <i>Native Title Act 1993</i> <u>NSW</u> • EP&A Act • State Environmental Planning Policy (Planning Systems) 2021 • State Environmental Planning Policy (Transport and Infrastructure) 2021 • State Environmental Planning Policy (Primary Production) 2021 • State Environmental Planning Policy (Biodiversity and Conservation) 2021 • State Environmental Planning Policy (Resilience and Hazards) 2021 • State Environmental Planning Policy (Resources and Energy) 2021 • <i>Roads Act 1993</i> • <i>National Parks and Wildlife Act 1974</i> • <i>Water Management Act 2000</i> • <i>Heritage Act 1977</i> • <i>Biodiversity Conservation Act 2016</i> (BC Act). <u>Local instruments</u> • Muswellbrook Local Environmental Plan 2009 (Muswellbrook LEP)

5. Engagement

5.1 Community and Stakeholder Engagement Strategy

NGH has prepared a Community and Stakeholder Engagement Strategy (CSES) (NGH Pty Ltd, 2021), refer Appendix B. Overall, the CSES aims to:

- Identify effective methods to inform the community which foster trust and build positive long-term relationships with community stakeholders.
- Identify ways to facilitate engagement, including input into the environmental assessment and Project development.
- Empower stakeholders to inform other community members with concerns about the Project.

This CSES identifies:

- Relevant local community and regulatory stakeholders.
- Possible concerns related to the engagement of each stakeholder group.
- A tailored consultation strategy for each stakeholder group.
- Ongoing consultation.

At the time of development, the CSES was prepared in consideration of the following guidelines and references:

- *Undertaking Engagement Guide, 2020, NSW Department of Industry, Planning and Environment.*
- *Community Guide to EIA 2019. NSW Department of Industry, Planning and Environment.*
- *Community Consultative Committee Guideline 2019, NSW Department of Industry, Planning and Environment.*
- *Beyond Public Meetings: Connecting community engagement with decision making, Twyford Consulting 2007.*

Containing a community profile and a socio-economic overview of the area, the CSES establishes detailed consultation strategies specific to the needs of each stakeholder group, as well as associated risk analyses and mitigation measures.

The CSES will be maintained and revised to ensure consultation during the development of the EIS remains consistent with the *State Significant Development Guidelines, 2021, NSW Department of Industry, Planning and Environment.*

5.2 Engagement carried out and community feedback

5.2.1 Landholders

Consultation commenced at the beginning at the preliminary site selection and has continued through consultation surrounding the Project site. Since early 2021, all adjacent landholders and residents of dwellings within 1 km of the site boundary were contacted by phone and sent follow-up information by email or post. A summary of the key consultation and activities carried out to date is provided in Table 5-1. Receiver numbers listed correspond to Figure 6-5, where a receiver number

is not provided, this Lot/DP does not have a dwelling. Evidence of consultation is provided in Appendix C.

Consultation to date with non-associated receivers within 1km of the Project has revealed that most are supportive of the project to date. One stakeholder raised concerns regarding the potential need to draw large volumes of water from the river to ensure successful establishment of vegetation screening, and the use of prime agricultural land (BSAL). Other stakeholders raised the issue of visibility by inquiring on the size of the solar farm and number of PV panels. One stakeholder also asked about site drainage. No other specific concerns or issues were raised. Most stakeholders requested that additional information should be posted/mailed to them and to be kept informed. A consultation log is being maintained to keep the community up to date.

5.2.2 Consultation with the Aboriginal community

Letters were sent to Heritage NSW, Muswellbrook Council, Hunter Local Land Services, Wanaruah Local Aboriginal Land Council, Native Title Services and The Registrar of Aboriginal Owners in April 2021, to advise these stakeholders about the Project.

Respondents have been registered as interested parties in the Project as part of the Aboriginal Cultural Heritage Assessment (ACHA) process, and will be kept informed and involved in the Project. Formal consultation requirements in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010) will be implemented concurrent with the ACHA.

5.2.3 Other consultation

BayWa r.e met with representatives from Muswellbrook Shire Council (Council) on 20 October 2021 to discuss the Project. Council indicated they are generally supportive of solar developments within the LGA. Council advised that visual impacts from the Project are likely to be a concern for members of the community located along Roxburgh Road.

The advertisement campaign covered the Hunter Valley region including Muswellbrook and Denman. Online as well as print advertisements were published in two local publications (i.e. the Muswellbrook Chronicle and the Hunter Valley News) providing Project details, a link to the Project website and a request for feedback and comments. No concerns about the Project have yet been received from the wider community. However, inquiries from contractors expressing interest in the Project have been received via email. Copies are provided in Appendix C.

BayWa r.e engaged Ausgrid on 7 July 2020 in regard to the required electrical connection of the Project to the electricity grid. Ausgrid provided BayWa r.e with information to assist in the planning of the electrical connection on 14 May 2021. Except for issues summarised in Table 5-1. Evidence of Ausgrid communication is provided in Appendix C.

5.2.4 Future consultation

Further engagement activities are intended to be ongoing throughout the Project development and construction phases and into operation. The CSES includes details of the consultation plan, such as identifying stakeholders, how to communicate, frequency of communication, and what to communicate. BayWa r.e. will be keeping the wider community updated through:

- Community information sessions
- Mailing newsletters

- Publishing advertisements
- Maintaining the web site.

Direct contact with interested parties and special interest groups would be undertaken by phone call and email where this has been requested. BayWa r.e. would aim to promptly reply to any inquiries sent online, via the website or by phone. Finally, in light of the evolving Covid -19 situation and health directives from the NSW Government, face to face communication and open days will only be carried out where this is deemed safe and accepted by the stakeholders. BayWa r.e. would discuss and explore alternative engagement methods with any stakeholders that have expressed an interest in the Project but hesitant to attend public events or meet with the proponent, these would include webinars.

Table 5-1 Consultation summary

LotDP	Date	Consultation method	Purpose	Consultation outcome and issues raised	Consideration of issues raised
Lot 4 DP6090 (R3)	14/05/2021	Phone call	BayWa r.e. informed the stakeholder of the proposed solar farm.	This landowner had no comments and did not indicate any concerns about the Project.	-
	24/06/2021	Phone call	BayWa r.e. advised the stakeholder that properties within a certain distance including his would be eligible for a \$5,000 contribution to a roof top solar system.	This landowner had no comments and did not indicate any concerns about the Project.	-
	25/06/2021	Email	BayWa r.e. emailed the stakeholder a letter to introduce the Project and planning process with a link to the Project website and feedback mechanisms.	This landowner did not have any comments on the information supplied.	-
Lot 21 DP235356 (R4)	17/06/2021	Phone call	BayWa r.e. spoke to the stakeholder about the proposed solar farm.	The stakeholder enquired as to the number of solar panels to be installed. The stakeholder was supportive of the Project and eager to speak to BayWa r.e. when they are present in the area to discuss the Project.	BayWa will directly contact the stakeholder with Project updates and seek a meeting opportunity
	17/06/2021	Email	BayWa r.e. emailed the stakeholder a letter to introduce the Project and	This landowner did not have any comments on the information	-

LotDP	Date	Consultation method	Purpose	Consultation outcome and issues raised	Consideration of issues raised
			planning process with a link to the Project website and feedback mechanisms.	supplied.	
Lot 3 DP215827, Lot 23 DP235356, Lot 24 DP235356 <i>(No dwelling on the lots, landowners were contacted at their principal place of residence)</i>	18/06/2021	Phone call	BayWa r.e. spoke to the stakeholder about the proposed solar farm.	The stakeholder was supportive of the Project and wished to speak with BayWa r.e. when they are in the area regarding drainage issues in the proposed development area. The stakeholder informed BayWa r.e. that he plans to build a house on the property.	BayWa r.e. advised the stakeholder that properties within a certain distance would be eligible for a \$5,000 contribution to a roof top solar system. The VIA will assess potential impacts to this property.
	18/06/2021	Email	BayWa r.e. emailed the stakeholder a letter to introduce the Project and planning process with a link to the Project website and feedback mechanisms.	This landowner did not have any comments on the information supplied.	-
Lot 21 DP1135281, Lot 22 DP1135281, Lot 23 DP1135281 <i>(No dwelling on the lots, landowners were contacted at their principal place of residence)</i>	18/06/2021	Phone call	BayWa r.e. called the stakeholder's office in Muswellbrook. BayWa r.e. were advised to contact the relevant employee, i.e. the property manager.	Refer below	-
	18/06/2021	Phone call	BayWa r.e. spoke to the relevant property manager and advised him of the proposed solar farm.	No issues were raised, however, BayWa r.e. offered to meet with the stakeholder when in the area to further discuss the Project.	

LotDP	Date	Consultation method	Purpose	Consultation outcome and issues raised	Consideration of issues raised
	18/06/2021	Email	BayWa r.e. emailed the stakeholder a letter to introduce the Project and the planning process with a link to the Project website and feedback mechanisms.	This landowner did not have any comments on the information supplied.	-
Lot 1 DP215827 (R5)	29/06/2021	Phone call	BayWa r.e. called the white pages listed number for the stakeholder but received no answer. A message was left.	-	-
	01/07/2021	Phone call	BayWa r.e. spoke to the stakeholder and advised him of the proposed solar farm.	The stakeholder did not have any specific concerns or questions about the Project	-
	06/07/2021	Post	BayWa r.e. posted a letter to the stakeholder introducing the Project and planning process with a link to the Project website and feedback mechanisms.	-	-
Lot 22 DP 235356 (R2)	18/06/2021	Phone call	BayWa r.e. spoke to the stakeholder about the proposed solar farm	The stakeholder enquired as to the size of the proposed solar farm – BayWa r.e. advised the stakeholder that it would be 84MW (approximately 200,000 solar panels).	BayWa r.e. informed the stakeholder that properties within a certain distance would be eligible for a \$5,000 contribution to a roof top solar system. BayWa r.e. offered to

LotDP	Date	Consultation method	Purpose	Consultation outcome and issues raised	Consideration of issues raised
				The stakeholder asked that the Project information letter be posted to him. No objections raised. This landowner had no further comments about the Project.	meet the stakeholder when in the area
	06/07/2021	Post	BayWa r.e. posted a letter to the stakeholder introducing the Project and planning process with a link to the Project website and feedback mechanisms.	-	-
Lot4 DP 215827 (R6)	18/06/2021	Phone call	BayWa r.e. spoke to the stakeholder about the proposed solar farm	The stakeholder enquired as to the size of the proposed solar farm – BayWa r.e. advised the stakeholder that it would be 84MW (approximately 200,000 solar panels). The stakeholder's primary concern was in respect to vegetation screening and if access to large quantities of water from the river was not available, plantings would not be established fast enough to effectively screen the solar farm. The stakeholder was also concerned with solar farms utilising prime agricultural land previously used for	BayWa r.e. informed the stakeholder that properties within a certain distance would be eligible for a \$5,000 contribution to a roof top solar system. BayWa r.e. offered to meet the stakeholder when in the area, however he declined. An Agriculture Impact Assessment will be undertaken, the level of the assessment will be based on the extent of high or moderate land soil capability, BSAL and CIC within the Project site.

LotDP	Date	Consultation method	Purpose	Consultation outcome and issues raised	Consideration of issues raised
				vineyards. The stakeholder asked that the Project information letter be posted to him.	Measure to minimise water use during construction and operation will be considered in the EIS and incorporated in the design. Biodiversity surveys and a Landscape Management Plan will identify the suitable plant species and planting program to ensure successful establishment of a vegetation screen.
	06/07/2021	Post	BayWa r.e. posted the stakeholder a letter to introduce the Project and the planning process with a link to the Project website and feedback mechanisms.	-	-

6. Environmental Assessment

6.1 Methodology

A preliminary environmental assessment and constraints assessment has been completed to assist in the identification of key environmental matters that would require further assessment within the EIS.

The assessment is based on the Proponent's experience in solar farm development, a desktop review, a preliminary site inspection (for confirmation of general site characteristics), biodiversity surveys (involving limited flora and fauna surveys) and vegetation mapping to identify potential high-level constraints and major risks to the Project. This was used to guide further detailed investigations and the indicative design of the solar farm.

The following was included in the preliminary environmental constraints assessment:

1. Investigation of the planning pathway and relevant legislation that may impact the Project.
2. Desktop review, including database searches relating to:
 - Threatened flora and fauna species and ecological communities
 - EPBC Act Protected Matters Reporting Tool
 - Aboriginal heritage
 - Land use / nearby receivers
 - Key fish habitat
 - Historic heritage
 - Soil and landscape capability mapping
 - Soil landscapes
3. Field inspection by a senior ecologist on 5 May August 2021. The inspection was undertaken to validate the biodiversity desktop information and obtain general site characteristics and information on the level of site disturbance to inform other environmental assessments.

From this analysis, some environmental matters were deemed to be key issues on the basis that they had the potential, without suitable mitigation, to have a significant impact on the environment. These include:

- Biodiversity
- Landscape and visual
- Noise and vibration
- Land use compatibility
- Soil and landforms
- Aboriginal heritage
- Non-Aboriginal heritage
- Access and traffic
- Social and economic impacts

The results are presented in the sections below with the relevant investigation strategy for further investigation in the EIS. The scale of impact, nature of impact and sensitivity of the receiving environment for the environmental issues addressed in Section 6.2 to Section 6.11 have been

summarised in the scoping summary table in Appendix F. The scoping summary table confirms the level of assessment required for each matter for the EIS phase, if a cumulative impact assessment (CIA) is required, the type of engagement required, relevant government plans, policies and guidelines and a reference to where the matter is addressed in the scoping report.

6.2 Biodiversity

6.2.1 Approach

Biodiversity values of the Project site and the Locality were assessed for the Project. The Locality has been investigated at a high level including the following information sources:

- Existing threatened species listings under the BC Act and EPBC Act.
- Existing records of threatened species sightings in the Project site, as recorded in the BioNet Database.
- DAWE PMST search (Matters of National Environmental Significance listed under the EPBC Act).
- Areas of outstanding biodiversity value declared under the BC Act 2016.

The biodiversity values in the Project site were assessed by an NGH senior ecologist on the 5 May 2021.

6.2.2 Background research

Background searches, shown in Table 6-1, undertaken in March 2021 and updated in February 2022 for the purposes of this assessment included Commonwealth and State databases to determine whether potential threatened flora and fauna species, populations, ecological communities, migratory species and Areas of Outstanding Biodiversity Value (AOBV) as detailed in State and Commonwealth legislation, occur or are likely to occur within the Project site. These searches are undertaken on a broad scale to capture all entities that may be of interest. In addition to this, searches of the Groundwater Dependent Ecosystems Database and Priority Weeds Database were also undertaken. Database search results are appended in Appendix A.

Table 6-1 Background search results

Background search	Search area	Results
DPE BioNet species sightings search of flora and fauna and communities listed as threatened under the BC Act	Project site with a 10km buffer (Locality)	The search results returned the following recorded threatened species within the search area: • 20 birds • 16 plants • 13 mammals.
PMST for species and populations listed as threatened under the EPBC Act.	Project site with a 10km buffer (Locality)	The search results returned the following that have the potential to occur within the Project site: • 1 Ramsar Wetlands (50-100 kilometres upstream) • 5 Threatened Ecological Communities

Background search	Search area	Results
		• 11 birds • 1 amphibian • 8 mammals • 11 plants • 2 reptiles • 5 terrestrial migratory birds.
Biodiversity Values Mapping and areas of outstanding biodiversity value	Project site	There are no areas of declared outstanding biodiversity value as listed under the BC Act are present within the Project site. The Project site does not contain significant wetland communities.

6.2.3 Site inspection

A preliminary site inspection of the Project site was undertaken by an NGH senior ecologist on 5 May 2021. The site inspection included identifying biodiversity constraints over the Project site, and high-level vegetation stratification, observations of habitat features such as hollow-bearing trees. Plant Community Types (PCTs) were determined based on the presence of diagnostic species via rapid assessment (RDPs). No floristic plots were undertaken. The degree of historical agricultural use and modification was also evaluated.

6.2.4 Land Category Assessment

A small portion (the northernmost paddock) of the Project site has been cleared and used for agricultural production on a rotational and ongoing basis (Figure 6-1). Although a formal Land Category Assessment has not been undertaken to inform this Scoping Report, preliminary investigation suggest that this area would be classified as Category 1 – exempt land due to historical and ongoing land use.

Category 1 Land is not required to be assessed for biodiversity values under the BAM other than for prescribed impacts. This means that development on Category 1 Land is unlikely to generate a credit obligation.

The remainder of the Project site contains Category 2 Land (103 ha or 94%) that if impacted are required to be fully assessed under the BAM.

Roadside vegetation is also classified as Category 2 Land, therefore, should any require inclusion in a BDAR, such areas would be fully assessed under the BAM also.



Figure 6-1 Category 1 Land in the north of the Project site

6.2.5 Plant Community Types (PCTs) and Threatened Ecological Communities (TECs)

PCTs within the Project site were determined based on the presence of diagnostic species via rapid assessment. The existing environment is highly modified, and two trees are present: Slaty Gum *Eucalyptus dawsonii* and Bulloak *Allocasuarina luehmannii*. No PCTs listed for the Hunter IBRA subregion within the BioNet Vegetation Classification (Veg-C) contain both these species. Additionally, the distribution of these two species across Project site is fairly distinct, as such areas of each species have been allocated to a PCT resulting in two PCTs being determined within the Project site.

Slaty Gum is listed for only one PCT within the Veg-C contains in the Hunter IBRA subregion:

- PCT 1655 - Grey Box - Slaty Box shrub - grass woodland on sandstone slopes of the upper Hunter and Sydney Basin.

Therefore, areas containing Slaty Gum have been allocated to PCT 1655. Note that the two small sections of planted Slaty Gum have also been allocated to PCT 1655 in accordance with the BAM 2020.

According to the Veg-C, PCT 1655 is associated with the following TEC listed as Vulnerable under the BC Act:

- Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion (Hunter Valley Footslopes Woodland).

All treed areas of PCT 1655 are considered to represent this TEC. This TEC can also represent the following EPBC Act listed as Critically Endangered TEC:

- Central Hunter Valley eucalypt forest and woodland.

However, a patch of PCT 1655 needs to be over 2ha in size before it can qualify for the EPBC Act listing.

Bulloak is listed for three PCTs in the Veg-C for the Hunter IBRA subregion. Given the lack of associate species within the Project site, determining a best fit PCT is hampered by this absence of information. Referencing mapping of the Upper Hunter (DPIE 2019, VIS_4894) suggests that a PCT containing Narrow-leaved Ironbark *Eucalyptus crebra*, Grey Box *E. moluccana* and Bulloak may have once occurred within the Project site. However, were this the case, either or both of the eucalypt species would need to have been selectively cleared in the past, leaving Bulloak behind. Whilst possible, this does not explain why the Slaty Gum have not been cleared so entirely.

As the Project site offers no evidence to suggest that the Bulloak present was once part of a Narrow-leaved Ironbark/Grey Box complex, areas of Bulloak within the Project site have been allocated to:

- PCT 1692 - Bull Oak grassy woodland of the central Hunter Valley.

PCT 1692 is associated with the following TECs:

- Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions.
- Central Hunter Grey Box—Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions.
- Central Hunter Valley eucalypt forest and woodland

However, as PCT 1692 within the Project site lacks any of the eucalypt canopy species characteristic of these TECs, PCT 1692 is not considered to represent any of these TECs.

The native vegetation and habitat present within the Project site are summarised in Table 6-2 and shown on Figure 6-2.

Table 6-2 Summary of vegetation and habitat across the Project site.

PCT	Condition	Easting	Northing	Description and habitat value	Image
1655	Varies from scattered trees to derived native grassland.	289641	6419517.5	Small areas of Slaty Gum, or derived grassland areas with no tree cover. No 'intact' areas of the PCT occur, however, treed areas provide foraging and roosting/breeding opportunities particularly for species that utilise hollow-bearing scattered trees. The treed patch of this PCT contains a high frequency of hollow-bearing trees.	

PCT	Condition	Easting	Northing	Description and habitat value	Image
1692	Varies from scattered trees to derived native grassland.	289360	6419848.5	Areas of Bulloak, or derived grassland areas with no tree cover. No 'intact' areas of the PCT occur, however, treed areas provide foraging opportunities for species that forage on <i>Allocasuarina</i> . Occasionally have hollows but generally low frequency compared to PCT 1655.	

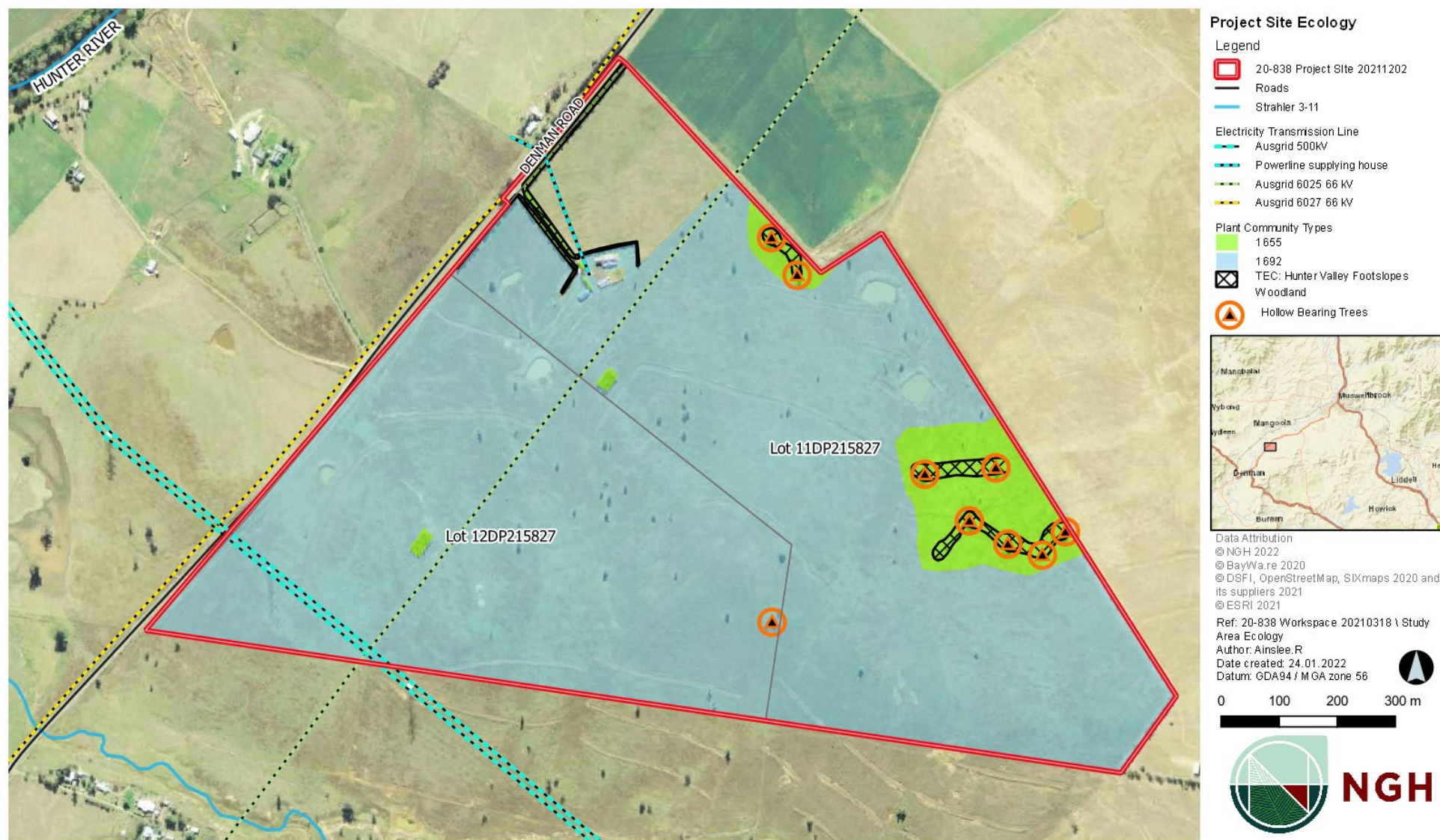


Figure 6-2 Vegetation mapping of the Project site

6.2.6 Vegetation and fauna habitat

With the exception of one cropped paddock, vegetation within the Project site comprises two small groups of planted Slaty Gum and scattered trees over modified pasture (Figure 6-3). The native component in the ground cover does not vary greatly, however, there are small areas where there is an observable decrease in native abundance and cover which generally coincides with an increase in annual weed cover.

The vegetation within the Project site does not form part of any notable connectivity feature and is typical of the heavily cleared landscape associated with the Hunter River in the region. However, the paddocks may be used by ground dwelling species and the scattered trees act as 'stepping stone' connectivity for birds moving through the area.

No waterways or natural aquatic features occur; however, rainwater is directed into five farm dams that are generally devoid of natural fringing vegetation.

Threatened flora species are generally considered unlikely to occur due to the level of past modification (clearing and cattle grazing) and resulting habitat degradation. Some species that can inhabit modified pastures, generally herbs, forbs and grasses, would require further investigation in accordance with the BAM.

There is limited value in terms of fauna habitat within the cropped/modified areas, other than foraging opportunities for species such as granivorous avifauna, raptors and macropod grazing. However, where scattered trees are present, particularly containing hollows such as many of the Slaty Gum, these trees provide habitat for threatened avifauna (birds and microbats) where scattered trees are noted as important habitat. This extends to Koala *Phascolarctos cinereus* (listed as Vulnerable under both the BC Act and the EPBC Act) although the Project site is unlikely to form part of important habitat for Koala, however, individuals may use the Project site for traversal to more suitable habitat in the locality.



Figure 6-3 Modified pasture and scattered trees that typifies the Project site



Figure 6-4 Farm dam in the north of the Project site

6.2.7 Constraints and need for further assessment

Generally, the Project site is not highly constrained ecologically attributable to historical clearing and land use. Canopy cover is very sparse. The patch of Slaty Gum in the east of the Project site represents the highest ecological constraint as this area represents Hunter Valley Footslopes Woodland TEC and has a high frequency of hollow-bearing trees with hollows of varying size classes.

To inform the early Project planning process and investigation strategies, biodiversity features within the Project site have been mapped to areas of high, moderate, or low constraints (Figure 7-1), refer to the constraints assessment in Section 7.

As part of the EIS, the detailed ecological surveys and further investigation and assessment will be undertaken including:

- Assessment via Biodiversity Development Assessment Report (BDAR) in consultation with Biodiversity Conservation Division (BCD)
- Where suitable habitat remains, targeted surveys for candidate species, both terrestrial and aquatic, as per DPE and DAWE requirements
- Avoidance, minimisation and mitigation measures required
- Offset strategies (if calculations determine that offset credits are required to offset impacts, then an offset strategy may be required).

6.3 Landscape and visual

6.3.1 Existing environment

The Project site is located within a rural setting approximately 12km southwest of Muswellbrook, NSW. The surrounding landscape is typical of an agricultural landscape, with varying cropping, grazing and livestock production contributing to the amenity of the area. There is currently limited vegetation screening along the Denman Road corridor.

There are no National Parks or State Forests within 10km of the Project site. The nearest National Parks are Wollemi National Park and Yengo National Park (both over 60km south-west of the Project site), and Wollemi State Conservation area is over 30km south of the Project site. Manobalai Nature Reserve is approximately 18km north of the Project site.

There are two transmission lines intersecting the Project site. A TransGrid 500kV power line intersects the southwest corner whilst a Ausgrid 66kV power line intersects the site from the northern boundary to the southern boundary. An Ausgrid 66kV powerline is within the Denman Rd corridor adjacent to the western boundary, and is the proposed connection for the Project.

The predominant land use within the Project site is cattle grazing, with a small portion (the northernmost paddock) being used for agricultural cropping on a rotational basis. There is a residential dwelling and farm sheds present on site, which belong to the associated landowner.

With the exception of one cropped paddock, vegetation within the Project site comprises two small groups of planted Slaty Gum and scattered trees over modified pasture (refer Figure 6-3). The vegetation within the Project site does not form part of any notable connectivity feature and is typical of the heavily cleared landscape associated with the Hunter River in the region. No waterways or natural aquatic features occur; however, rainwater is directed into five farm dams that are generally devoid of natural fringing vegetation. As such the vegetation remaining is low and sparse, offering little screening potential for infrastructure.

The topography of the Project site is gently sloping from north to southeast as shown on Figure 6-5. The lowest topography follows Denman Road and is approximately 120m AHD and plateaus at around 143m near the centre. As such, the southern half of the site is on relatively level area. The topography of the surrounding area continues to rise steeply south of the site, whilst to the north, the floodplain of the Hunter River offers a level flat topography.

Sixty-one residential receivers with potential viewpoints of the Project have been identified within 5kms of the Project site. Table 6-3 provides the distance between each identified receiver as well as altitude and height difference with the Project site, whilst locations are shown on Figure 6-5. Table 6-4 summarises the number of receivers within various distances from the Project site and a brief description of the potential visibility of the Project.

Most receivers are located within areas zoned RU1 – Primary Production (Figure 6-6).

Table 6-3 Sensitive receiver distance, altitude and height difference from the Project site

Receiver	Distance to site boundary (m)	Altitude (m)	Height difference with average Project site (m)
R1	0	147.2	95.78
R2	60	180.9	111.91
R3	338	128.4	113.27

Receiver	Distance to site boundary (m)	Altitude (m)	Height difference with average Project site (m)
R4	373.1	125.6	91.77
R5	677.3	138.4	119.85
R6	854.1	122.8	62.10
R7	1138.4	121.5	114.58
R8	1238	173.5	118.27
R9	1385.2	128.5	117.38
R10	1551.5	142.5	104.65
R11	1651.8	126.8	120.21
R12	1774.4	147.7	121.54
R13	1894.9	120.9	69.50
R14	1987.7	121.9	114.50
R15	2004.8	128.6	100.48
R16	2060.4	144.4	116.18
R17	2071.8	121.5	95.28
R18	2093.1	122.8	122.07
R19	2116.3	118.4	121.06
R20	2152.5	127.7	114.41
R21	2174.5	129.4	98.57
R22	2179.1	128.7	121.55
R23	2197.8	176	120.18
R24	2331	121.1	124.56
R25	2482.5	128.1	115.33
R26	2698	132.8	113.61
R27	2756	127.8	114.27
R28	2758.2	118.3	67.00
R29	2774.1	185.9	121.90
R30	2792.3	205.8	114.88
R31	2863.5	129.3	110.19
R32	2877	116	115.18
R33	2960.7	129	124.74
R34	3053.9	115.7	57.14
R35	3086.6	129.7	37.15
R36	3105.4	143.1	113.69
R37	3119.1	130.4	126.97
R38	3240.3	151.2	114.01
R39	3286	160	127.28
R40	3498.8	114.6	99.95
R41	3510	132.5	112.61
R42	3755	118.3	83.01
R43	3819.2	131.1	128.38
R44	4086.1	114.4	110.53
R45	4191.2	139.8	124.68
R46	4235	143.6	111.92
R47	4258.8	124.8	128.59

Receiver	Distance to site boundary (m)	Altitude (m)	Height difference with average Project site (m)
R48	4263.9	204.2	103.17
R49	4459.8	132	99.40
R50	4478.9	214.4	118.20
R51	4610.5	112.7	38.83
R52	4675.1	113.4	111.04
R53	4679.2	157.2	28.56
R54	4713.4	213.7	130.29
R55	4761.8	125.9	129.59
R56	4763.7	130.1	85.84
R57	4771.4	132.5	29.32
R58	4800	184.5	117.07
R59	4824	131.1	112.93
R60	4907	123.2	110.51
R61	4977	124.7	58.54

Table 6-4 Residential receivers within five kilometres of Project site (including one associated receiver; R1).

Distance	Number of residential receivers	Residential receivers	Potential for view of the Project prior to implementation of mitigation measures
Within 250m	2	R1, R2	Resident R1 is an associated resident. Given the minimal distance and lack of physical barrier or vegetation screening between the Proposed solar farm and R2 it is likely that this receiver would have a view of the Project. It is noted that R2 is a business.
250m to 500 m	2	R3, R4	Both residential receivers are expected to have a view of the Proposed solar farm. R4 is located on the opposite side of Denman Road, and R3 is located on the southwest boundary of the Project. It is noted that R4 operates a commercial camel milk farm that includes farm tours and camel rides.
500m to 1km	2	R5, R6	These residential receivers may have a limited view of the Project. R5 is located on the opposite side of Denman Road, behind R4, and R6 is located on the opposite side of Denman Road, to the northeast of the Project site, with several paddocks between it and the Project.
1km to 2km	8	R7 to R14	Topography, distance and vegetation screening are likely to influence the degree of visibility of the Project to these sensitive receivers. The dwellings on Roxburgh Road are located on a ridge and have views of Denman
2km to 5km	47	R15 to R61	

Distance	Number of residential receivers	Residential receivers	Potential for view of the Project prior to implementation of mitigation measures
			solar farm and may potentially have visibility of this Project. The visibility and magnitude of impact (including cumulative) will be confirmed during specialist assessments in the EIS stage.

Within 1km of the Project site, receivers R1, R2, R3 and R4 are likely to have views of the Project, whilst R5 and R6 may have limited views. Eight dwellings are located between 1km and 2kms from the Project site, and the topography, distance and vegetation screening are likely to influence the degree of visibility of the Project to these sensitive receivers.

Consultation with Council has indicated that dwellings located along Roxburgh Road, approximately 5km from the Project site located, are positioned on a ridge and may have long range views towards the Project (Figure 6-5). The elevations of these properties ranges from 118m to 157m.

Potential public viewpoints that may have visibility of the Project site include Denman Road whilst the property associated with R4 also operates camel farm rides and tours of the farm.

Non-associated receivers may be sensitive to changes in the landscape character; visual impact was raised in early consultation activities. Utilising aerial imagery, it is estimated up to five non-associated receivers within 1km of the Project would have direct views to the Project site. Whilst more may have limited views depending on detailed consideration of vegetation, structures and localised topography.

Early consultation identified visual impact as a concern for some stakeholders with stakeholders inquiring about the size of the solar farm and number of panels. One stakeholder mentioned vegetation screening, but their concern related to the potential use of large volumes of water from the river to ensure successful establishment of the planted vegetation. Refer to Section 5 for further details.

The Proponent explained that the detailed visual impact assessment would recommend the most suitable mechanisms to mitigate views and include a Landscape Management Plan. Biodiversity surveys would help to inform the most suitable plant species to complement native habitat and planting methods to maximise success.

The Project site would not be visible from any National Park, Nature Reserve or State Forest.

The Project would however, be highly visible by commuters along Denman Road. Generally, these views would be considered of less significance, being limited in duration for passing motorists. These views would also be assessed and the need for mitigation considered.

6.3.2 Issues for consideration

A detailed assessment of the level of visual impact in accordance with the methodology outlined in the draft *Visual Assessment Framework for Large-Scale Solar Energy Development* will be undertaken as part of the EIS process. This will consider the potential for the solar farm to affect local landscape character as well as specific viewpoints. Assessment would include detailed viewshed analysis and further consideration of vegetation and structures in the landscape and localised topography.

Impacts would be assessed in terms of the change in visual character produced by a development, the degree of contrast produced, and the likely sensitivity of receivers to the change, as well as consideration of the effectiveness of potential mitigation options.

Further consultation will be undertaken broadly to understand the local values of the area, including visual characteristics valued by the community. Additional engagement with specific affected residences identified as likely to have a view of solar farm infrastructure would be undertaken to identify the nature and significance of impacts and the need for mitigation measures.

Generally, the mitigation of low-profile solar farm infrastructure in low relief landscapes is highly feasible. Visual impacts attenuate rapidly with distance in these cases. While the focus of mitigation would usually be on close proximity residences, the draft *Visual Assessment Framework* also provides a systematic and repeatable way to assess viewpoints that may be at some distance, but look down upon the site from an elevated location, and therefore still have potential for impacts.

Through the early consultation with surrounding landholders, BayWa r.e proposes to design the Project to have minimal visual impact on surrounding receivers by including a Landscape Management Plan and vegetation screening at suitable locations along the boundary of the Project to mitigate views.



Figure 6-5 Sensitive receiver map

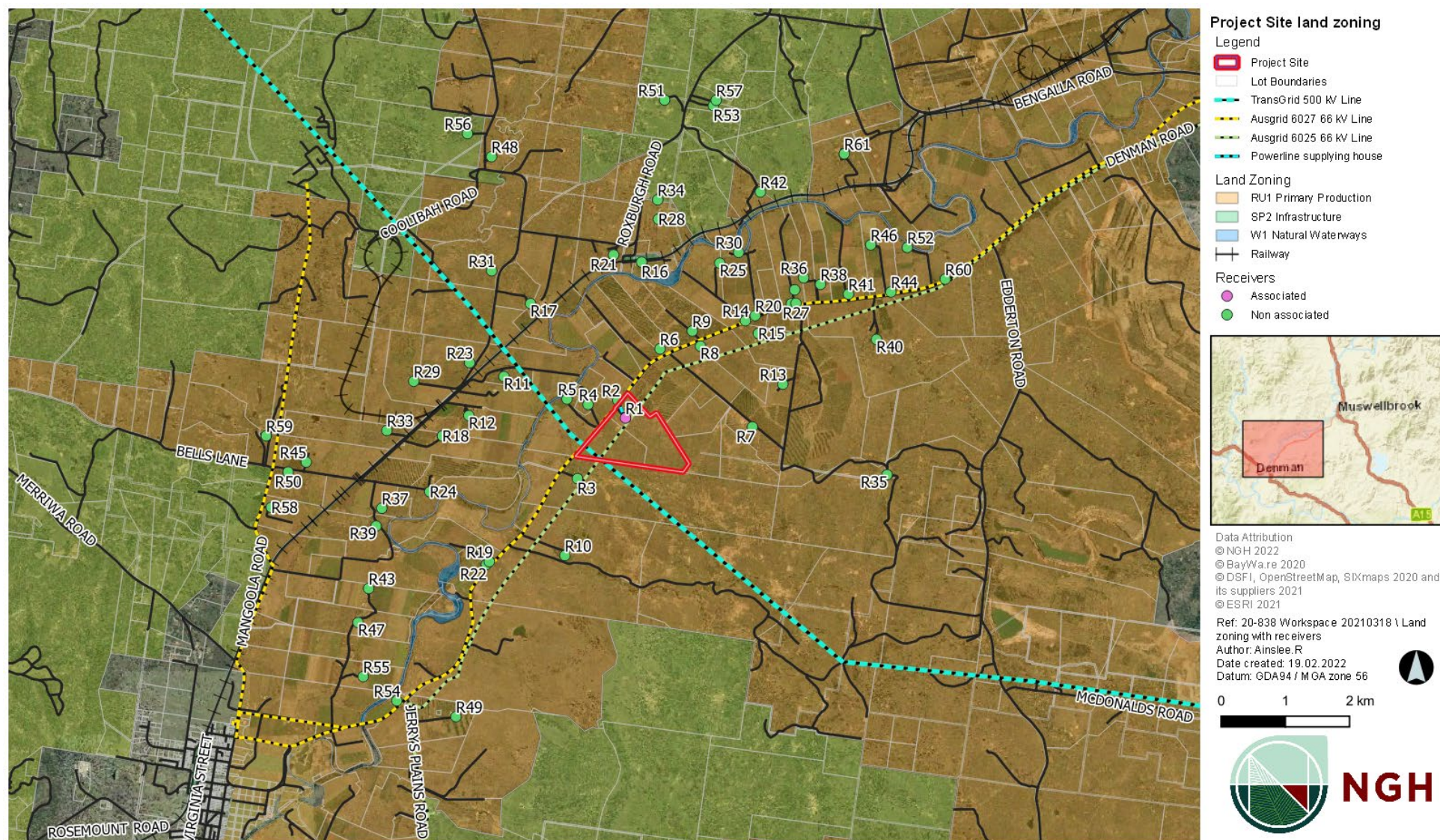


Figure 6-6 Land zoning in relation to receiver locations

6.4 Noise and vibration

6.4.1 Existing environment

The Project is located in a rural setting. The main sources of background noise would include traffic noise from Denman Road, as well as routine agricultural operations in the area. The land surrounding the Project site is used for cropping and grazing, which would contribute to the generation of noise and dust in the vicinity of the Project.

Table 6-4 indicates that there are five non-associated residential properties within 1 km of the Project site. These receivers may be sensitive to increased noise and vibration levels from construction and operation of the solar farm. We note there is one associated receiver within the Project site, as they are associated, they are not considered 'sensitive receivers' for the purposes of the EIS.

The greatest noise and vibration impacts are most likely to be experienced during the construction phase when there is a large workforce onsite and activities such as earthworks and piling are being carried out. During the operation of the solar farm, noise levels would likely be reduced, as agricultural machinery would largely cease. Noise would be generated from the solar tracking system (if a tracking system is decided upon) as well as the substation and switchgear and any maintenance works undertaken at the site.

6.4.2 Issues for consideration

A construction and operational noise and vibration assessment would be undertaken as part of the EIS to assess potential noise impacts for affected residents. The report would include an assessment of road traffic noise as a qualitative assessment of offsite traffic movements inclusive of a review of existing and future traffic movements for the Project. The assessment would be undertaken in accordance with the Interim Construction Noise Guideline (Department of Environment & Climate Change, 2009), NSW Noise Policy for Industry (NSW Environment Protection Authority, 2017), Assessing Vibration: A Technical Guideline (Department of Environment and Conservation NSW, 2006) and NSW 'Road Noise Policy' (Department of Environment, Climate Change and Water, 2011). Measures to minimise noise impacts would be recommended for the construction and operation of the Project.

6.5 Land use compatibility

6.5.1 Existing environment

The land use in the Project site is primarily Grazing Native Vegetation with residential and farm infrastructure. Land use categories in the Project site, according to the NSW Land Use data layer (DPIE, 2017), are identified in Table 6-5 and Figure 6-7. Agriculture, forestry and fishing employs 472 people within Muswellbrook region, providing an estimated regional export of \$131 million annually (Muswellbrook Shire Council, 2021).

Table 6-5 Land use categories within the Project site

Land use category	Area (ha) within the Project site
2.1.0 Grazing native vegetation	102.78
6.2.0 Reservoir/Dam	0.185
5.4.0 Residential and farm infrastructure	8.04

Cultivation and cropping would not be possible throughout the construction, operation and decommissioning of the Project, though sheep grazing may be possible during operation. The current land use would need to be diversified to include electricity generation. Furthermore, the Project site would be returned to its former state following decommissioning of the solar farm, allowing for continued agricultural production.

The Project site is zoned as RU1 (Primary Production) under the Muswellbrook Regional Local LEP.

There is no Crown Land associated with the Project site.

A search on MinView on 31 March 2021 identified one exploration title within the Project site - Hunter Valley Energy Coal Pty Ltd hold a coal exploring title (EL5965 (1992 Act) which expires in 2026. The extent of the title boundary within the Project site is shown in Appendix A Mining Titles. Consultation with the title holder will be undertaken during the EIS preparation.

6.5.2 Constraints and need for further assessment

The Project would involve earthworks and ground disturbance, as well as piling. This would be limited to the Development footprint, access, and transmission lines. The impact of the Project on agricultural production in the region would be assessed in the EIS via a Land Use Conflict Risk Assessment (LUCRA) and Agricultural Impact Assessment. Refer to soil resources discussed in Section 6.6. Most of the Project site is considered to have moderate to high limitations for high-impact land uses and is therefore unlikely to be highly significant in terms of local agricultural economy.

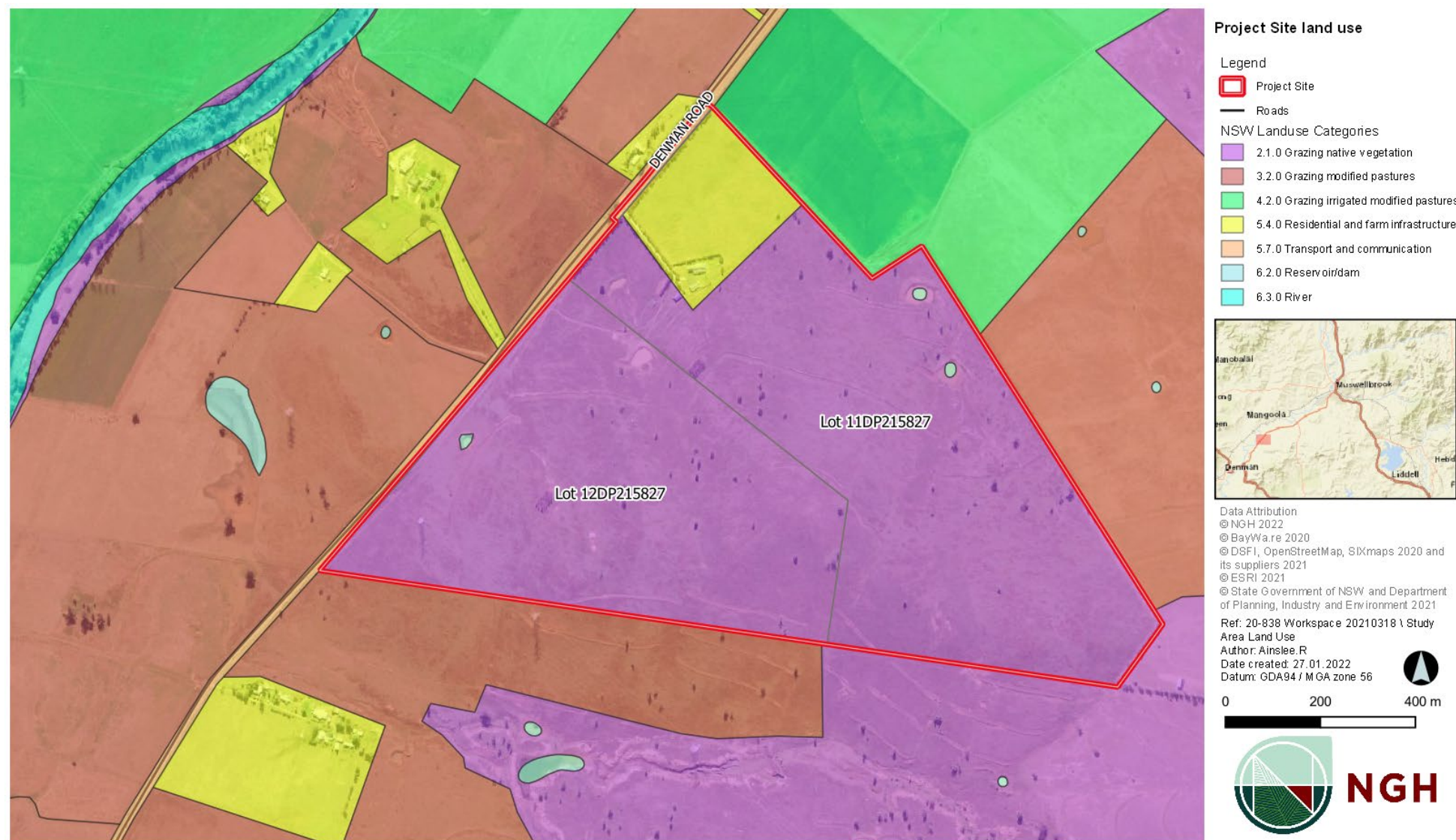


Figure 6-7 Land Use Map

6.6 Soils and landforms

6.6.1 Existing environment

The Project site is highly disturbed from agriculture activities. The land has been subjected to ploughing, and grazing. The soil quality is likely degraded from the application of pesticides and fertilisers used in agricultural practices. Four soil landscapes cover the Project site:

- Bayswater Soil Landscape
- Dartbrook Soil Landscape
- Hunter Soil Landscape
- Liddell Soil Landscape

The Project site is not subject to a Mine Subsidence District.

There are no mapped areas of Acid Sulfate Soils within the Project site.

A search of the NSW Contaminated Sites Register was undertaken on 18 March 2021 and updated on 8 February 2022. The search identified two sites within Denman, however none are within 5 km of the Project site. The Project site does not appear on the List of NSW Contaminated Sites notified to the EPA as of February 2021.

Land and soil capability (LSC) mapping across the site (Figure 6-8) shows the majority of the Project site is LSC class 4 (93 ha), followed by LSC Class 5 (18 ha). Less than 1% of the Project site (0.009 ha) is LSC class 3 in the northern corner and is likely to be avoided given its location against the property boundary of the Lot. The general definitions of these LSC classes is presented in Table 6-6. As such the Project site is generally moderate to low capability agricultural land, with only the northern corner mapped as high capability.

Table 6-6 Land and soil capability definitions (NSW Office of Environment and Heritage, 2012)

LSC class	General definition
3	High capability land: Land has moderate limitations and is capable of sustaining high-impact land uses, such as cropping with cultivation, using more intensive, readily available and widely accepted management practices. However, careful management of limitations is required for cropping and intensive grazing to avoid land and environmental degradation.
4	Moderate capability land: Land has moderate to high limitations for high-impact land uses. Will restrict land management options for regular high-impact land uses such as cropping, high-intensity grazing and horticulture. These limitations can only be managed by specialised management practices with a high level of knowledge, expertise, inputs, investment and technology.
5	Moderate–low capability land: Land has high limitations for high-impact land uses. Will largely restrict land use to grazing, some horticulture (orchards), forestry and nature conservation. The limitations need to be carefully managed to prevent long-term degradation.

BSAL is land identified to have high quality soil and water resources capable of sustaining high levels of productivity. Whilst the Project site was located to purposefully avoid BSAL, mapping for the Upper Hunter Region shows part of the Project site is mapped within a BSAL area (Figure 6-9). This is a small portion of land (3.8 ha out of the total 110 ha), and in the wider context of the area would not significantly impact the availability of BSAL land. CIC for Viticulture and Equine also occur across the site, refer to Appendix A. Complete avoidance of CIC would prevent the development of this renewable energy facility in this strategic location. The site is predominantly used for cattle grazing, with a small portion (the northernmost paddock) being used for agricultural production on a rotational basis, not viticulture. Preliminary investigation from the biodiversity site survey, suggest that the site would be classified as Category 1 – exempt land due to historical and ongoing land use. Additionally, regional mapping indicates that CIC follows the course of the Hunter River and extends east and west beyond Denman and Muswell and south towards Jerrys Plains.

The construction methods for solar farms does not require significant modification of landforms. Excavation is typically limited to trenching for cables, whilst piling is used to install steel piles that support the solar module mounting system. The Project is not anticipated to change the existing drainage patterns of the site, and therefore the Project is unlikely to change the erosion potential of the site. The land capability of the site would not be affected given the nature of the works involved for the installation of a solar farm. Finally, solar farm Projects are able to be decommissioned and rehabilitated without any long-term impacts on the land, including soil fertility.

The economic benefits from the construction and operation of the project would highly likely exceed benefits of the returns received from current agricultural activities on a per ha basis at the Project site.

The co-location of solar energy projects with existing agricultural land uses is also possible and would be explored. Sheep grazing, beekeeping and/or horticultural activities will be considered. Co-location supports the continued agricultural productivity of the land and protects existing land uses to ensure that they can continue after the solar energy project site has been decommissioned and the land has been rehabilitated and returned to its former use

Where infrastructure can be developed outside BSAL, this would be investigated as part of the EIS. Impact of the facility on CIC in relation to its availability and productivity on a local and regional basis would be assessed as part of the EIS.

6.6.2 Issues for consideration

The majority of the Project site is located on moderate capability land and CIC, however, an assessment of the Project's impacts on agricultural land will be completed and will include a physical soil assessment to verify the quality and capability of the land to be responsive to the communities concerns of agricultural land use. The soil survey will be used to describe soil type, fertility, land and soil capability and baseline soil conditions; and verify the LSC of the land and present mapping to identify any differences from publicly available mapping.

Results from this assessment will be taken into consideration to site and design the layout of the solar farm to avoid productive land where feasible.

If Class 3 LSC, BSAL and CIC is confirmed to be present within the Development footprint, then a detailed assessment which considers siting options to remove any BSAL and class 3 LSC land from the development footprint would be undertaken. The Project justification, and economic assessment of potential impacts to land use and soils will be included in the EIS. Mitigation measures and methods to incorporate continued productivity of the land with the solar farm

operation will be considered. Where land is found to be LSC Class 4, then a level 2 reduced assessment would be completed. An assessment of Project impacts on agricultural land is not required where solar infrastructure is located on land mapped as LSC Class 5. In all cases, a Level 1 (Basic) assessment will be completed, given the Project site is adjacent to rural zoned land.

Consideration of soil and erosion impacts, and proposed mitigation measures for the construction, operation and decommissioning of the HRSF would be included within the EIS.

Management of ground cover during operation and restoration of the land capability of the Project site would be recommended in the EIS and is considered highly feasible. Rehabilitation would be with reference to baseline soil testing to guide any remedial management actions that may affect maintaining groundcover during operation or rehabilitation of disturbed areas during decommissioning.

The search of section 58 of the *Contaminated Land Management Act 1997* (CLM Act) indicated that the site has not been registered on the Record of Notices, or on the list of notified sites under section 60 of the CLM Act 1997 with regards to the Duty to Report Contamination.

Presence of substantiative contamination within the Project site is considered unlikely. As such, it is anticipated that a detailed investigation of contamination would not be required within the EIS. Mitigation measures to prevent contamination as a result of the Project will be included in the EIS.

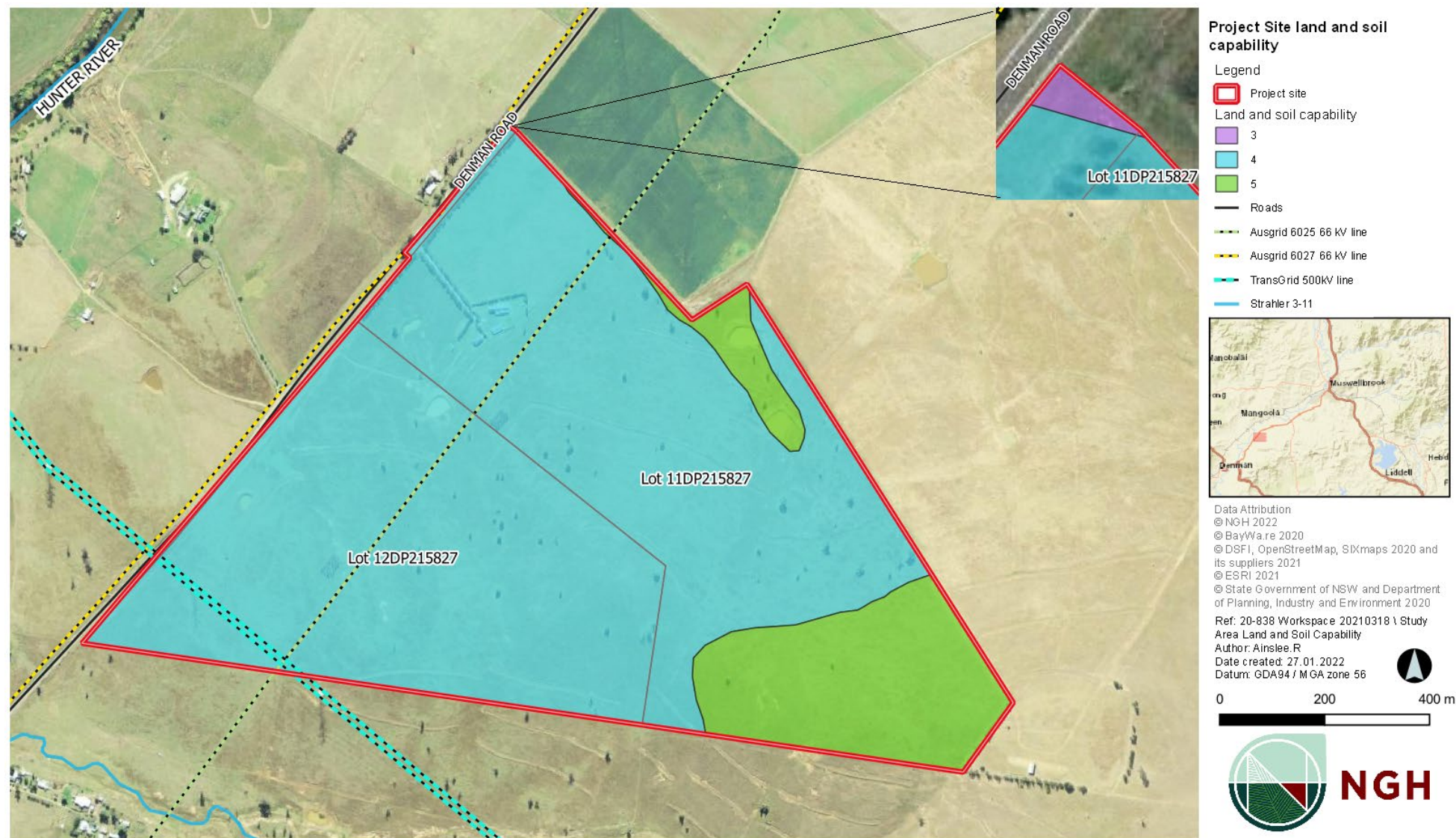


Figure 6-8 Land and soil capability map

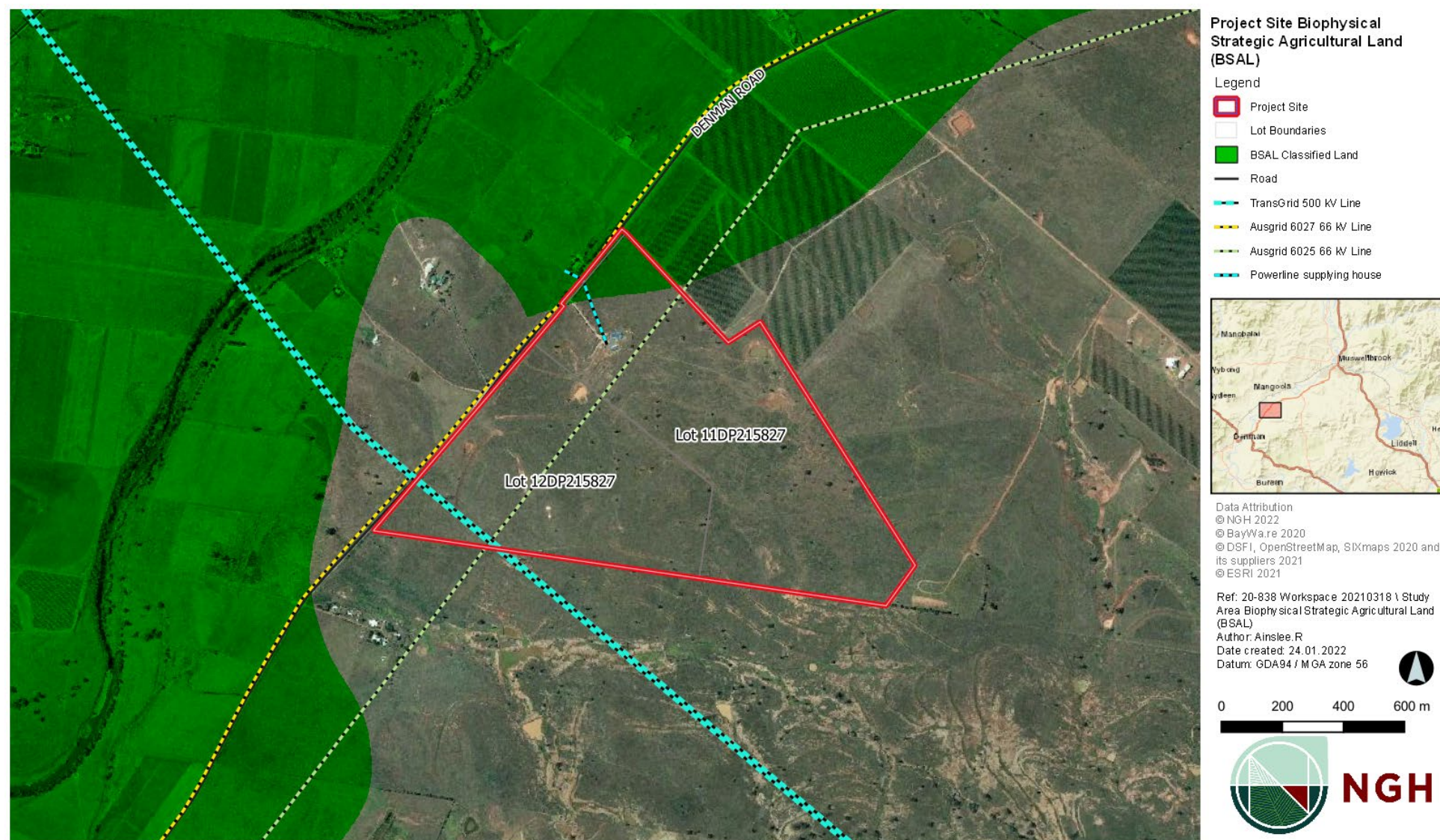


Figure 6-9 BSAL mapping

6.7 Aboriginal Heritage

6.7.1 Existing environment

A search of relevant heritage registers for Aboriginal sites and places provides an indication of the presence of previously recorded sites. A register search is not conclusive as it requires that an area has been inspected and any sites are provided to the relevant body to add to the register. However, as a starting point, the search will indicate whether any sites are known within or adjacent to the investigation area.

An extensive search of the Aboriginal Heritage Information Management System (AHIMS) utilising a one-kilometre buffer of the Project site was undertaken on 30 March 2021 and updated on 8 February 2022. Results are presented in Figure 6-10.

The search identified 11 registered sites within a one-kilometre buffer of Lot 11 DP215827. All sites were identified as 'Open Site: Artefact'.

No Native Title claims are relevant to the Project site.

6.7.2 Issues for consideration

Given the presence of Aboriginal objects within proximity to the Project site, further field inspection of the proposed development area is required to accurately characterise the Aboriginal heritage potential of the Project site. Risk in relation to Aboriginal heritage would need to be confirmed based on the results of such an assessment. An Aboriginal Cultural Heritage Assessment (ACHA) and Aboriginal community consultation with registered stakeholders should be undertaken in conjunction with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010) and the *Guide to Investigating Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (Office of Environment and Heritage, 2011).

An ACHA and associated stakeholder consultation process will be completed as part of the EIS. This would include consultation with the Wanaruah Local Aboriginal Land Council.

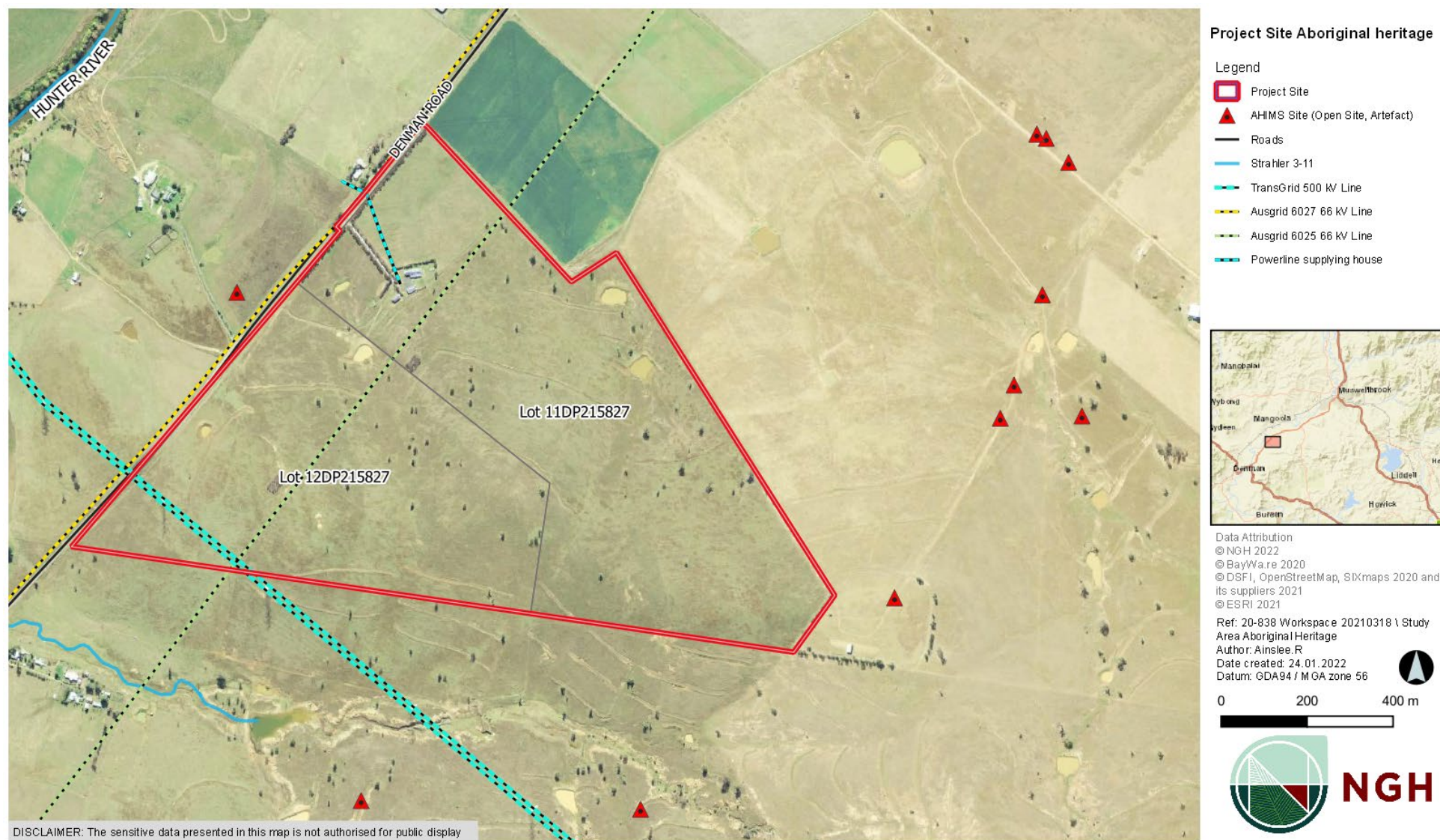


Figure 6-10 Registered AHIMS sites present within a one-kilometre search zone (*Note: This map contains sensitive information and cannot be publicly displayed*)

6.8 Non-Aboriginal Heritage

6.8.1 Existing environment

A search of the Australian Heritage Database, NSW Heritage Register and s170 Register, and the Muswellbrook LEP was undertaken on the 31st March 2021 to identify any listed heritage items in the Project site. None of the searches identified any heritage listings within the Project site.

State Heritage item I13 (Piercefield) is located opposite the Project site at 1532 – 1618 Denman Road. Works would not occur within land listed on any of the heritage registers.

6.8.2 Issues for consideration

A Statement of Heritage Impact (SoHI) would be required to confirm the Project would not impact on 'Piercefield', and any other non-listed heritage items in the locality including visual and vibration impacts.

6.9 Access and traffic

6.9.1 Existing environment

The Project site is only accessible from Denman Road, which adjoins the New England Highway to the north-east at Muswellbrook, and the Jerrys Plains Road/Golden Highway to the south-west near Denman. As such, two haulage route options are available for the transport of plant from the Port of Newcastle to the Project site, refer to Figure 6-11 which shows both options for the haulage route.

According to the Transport for NSW 'Combined Higher Mass Limits (HML) and Restricted Access Vehicle (RAV) Map' (TfNSW, 2020), Denman Road, New England Highway and Golden Highway are all approved for 19 metres, 23 metres and 25/26 metre B-double routes. They are also approved for 4.6-metre-high vehicles. The Road Train Network Map (TfNSW, 2020) does not cover the Upper Hunter region.

TfNSW's Traffic Volume Viewer (TfNSW, 2021) shows the New England Highway 1.64 kilometres south of Muscle Creek Road experienced an average of 8,660 vehicles daily in 2020, whilst the Golden Highway (Jerrys Plains Road) 2.35 kilometres east of Edderton Road experienced an average of 1,282 vehicles per day in 2012 (this is the most recent data for this station).

Traffic volume data is not available for Denman Road, however it is expected that the road would be limited to local traffic travelling between Denman and Muswellbrook, as well as heavy vehicles transporting stock and agricultural products. Traffic volumes during certain times of the year, such as harvest and sowing, would likely experience an increase.

During the anticipated 18-month construction period, the expected daily construction vehicle numbers are as provided in Table 6-7. Indicatively, construction vehicles would range from light vehicles to 26m B-Doubles. Light vehicles would arrive during AM/PM peaks, whilst heavy vehicle deliveries would be spaced out during the day.

Operational traffic would likely consist of a maximum of eight one-way vehicle trips per day, and an average of 40 one-way trips per week, indicatively.

Table 6-7 Anticipated daily construction vehicle numbers

Construction stage	Estimated one-way vehicle trips per day		Total one-way vehicle trips
	Light vehicles	Heavy vehicles	Oversize and/or over mass (OSOM) vehicles
Stage 1: Site establishment 3 months	30	30	0
Stage 2: Delivery of infrastructure 6 months	30	40	4
Stage 3: Installation 9 months	30	40	0

Three construction site access points from Denman Road are currently under consideration, as shown in Figure 3-1. The selected access point for construction would also be used for operation.

Internal access roads would be established within the Development footprint to facilitate movement around the site during construction and to allow for ongoing maintenance during operation, refer to Figure 3-1. Internal access roads would be between four metres and six metres wide and comprise of a gravel or sealed surface.

6.9.2 Issues for consideration

The haulage route options and site access options would be further investigated during the preparation of the EIS. The site access assessment will determine if intersection or road upgrades are necessary to meet Council and TfNSW guidelines. Consultation regarding site access will be undertaken with TfNSW and Council as part of the development of any upgrade requirements that will form part of the project.

Construction traffic impacts would be considered in the EIS and take into consideration existing traffic volumes and any requirements from the roads' authority.

Management of traffic, for safety as well as road pavement conditions would be required.

The mitigation measures would require the preparation of a Traffic Management Plan and the confirmation of haulage routes.

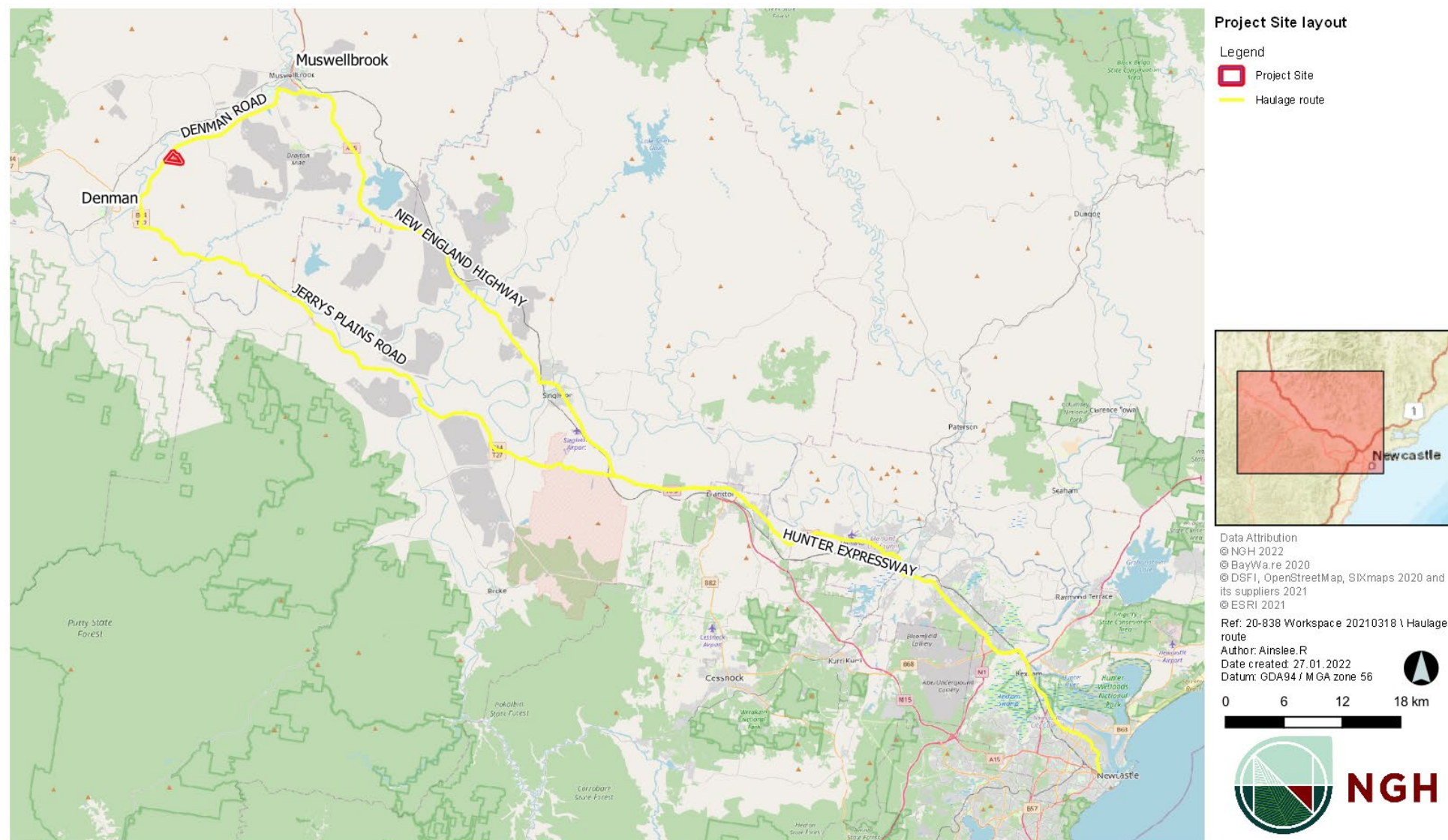


Figure 6-11 Haulage route

6.10 Social and economic impacts

6.10.1 Existing environment

The Project's indicative area of influence at the scoping stage is defined as the Muswellbrook LGA, with a particular focus on the State Suburbs (SSC) of Muswellbrook and Denman. For some impacts, more detailed consideration will be given to the properties and residents in close proximity to the locality. Broader consideration will also be given to regional level impacts, where appropriate.

The area of influence is kept geographically broad at this scoping stage, to ensure the full breadth of potential social impacts can be identified. The area is determined by the scale and nature of the proposed development, being a utility-scale solar farm whose impacts and benefits on the local community, economy and landscape may extend for tens of kilometres from the Project site over a relatively long time period. It also considers the baseline socio-economic characteristics of the community; specifically, that the Project would occur in a rural area with relatively low population density, high natural assets, and a community and economy that is strongly influenced by agriculture and mining, as well as uncertainty due to the impacts of climate change and the transitions that are occurring in energy production.

Refer to Figure 6-12 for an overview of the Project's area of influence.

Social baseline

A preliminary social profile was developed for the Project's area of influence using demographic and socio-economic data collected and synthesised from the ABS 2016 Census, in order to gain a broad understanding of the existing socio-economic context. Baseline information was sourced for the townships of Denman and Muswellbrook and the Muswellbrook LGA, with comparison to the Regional NSW average. Refer Table 6-8.

The data indicates that at the 2016 Census, compared to Regional NSW averages, the Muswellbrook LGA generally had a:

- Younger population
- Higher proportion of Aboriginal and/or Torres Strait islander people
- Higher rate of unemployment
- Higher median weekly household incomes, but also higher levels of socio-economic inequality
- Higher rate of households in rental stress
- Workforce dominated by the coal mining industry.

These are indicative only, and do not capture the change that has occurred since, including the short and long-term impacts of the Covid-19 pandemic.

Scoping Report Hunter River Solar Farm

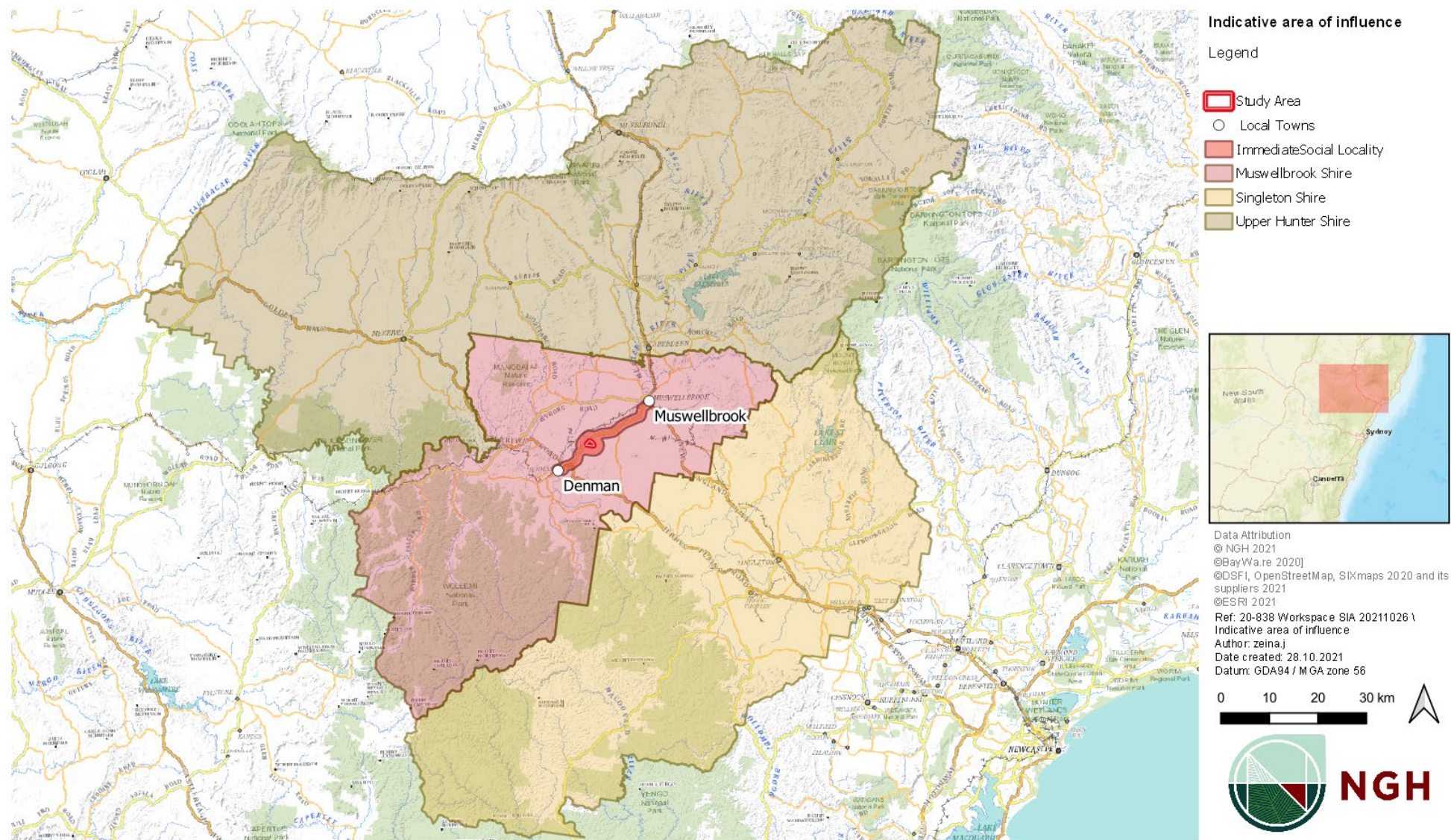


Figure 6-12 Indicative area of influence

Table 6-8 ABS census data for the Project's area of influence

Measure	Denman SSC	Muswellbrook SSC	Muswellbrook LGA	Regional NSW
Demographic characteristics				
Population (no.)	1,789	12,075	16,086	2,643,536
Median age (no.)	41	34	35	43
Born overseas (%)	13.1	15.1	15.3	19.1
Aboriginal and/or Torres Strait Islander (%)	6.7	9.3	8.3	5.5
Education & employment characteristics				
Finished year 12 (highest) (%)	9.5	10.9	10.6	11.6
Cert III of IV (highest) (%)	22.4	22.5	22.7	19.7
Bachelor degree or higher (%)	4.9	8.1	7.9	14.5
Unemployed (%)	4.2	9.6	8.3	6.6
Median weekly household income (\$)	1,176	1,331	1,346	1,168
Proportion of households with median weekly income below \$650.00 (%)	24.5	23.6	22.6	24.7

Measure	Denman SSC	Muswellbrook SSC	Muswellbrook LGA	Regional NSW
SEIFA (IRSAD) score/quintile	918/1 st quintile	903/1 st quintile	917//2 nd quintile	N/A
Labour force (no.)	807	5,380	7,331	1,182,573
Industry of employment (top five by % of total)	1. Coal Mining 2. Hospitals (except Psychiatric Hospitals) 3. Cafes and Restaurants 4. Horse Farming 5. Wine and Other Alcoholic Beverage Manufacturing	1. Coal Mining 2. Supermarket and Grocery Stores 3. Fossil Fuel Electricity Generation 4. Takeaway Food Services 5. Primary Education	1. Coal Mining 2. Horse Farming 3. Fossil Fuel Electricity Generation 4. Supermarket and Grocery Stores 5. Primary Education	1. Hospitals (except Psychiatric Hospitals) 2. Aged Care Residential Services 3. Supermarket and Grocery Stores 4. Primary Education 5. Other Social Assistance Services
Dwelling and tenure characteristics				
Proportion of occupied private dwellings (%)	87.4	84.7	84.4	86.8
Proportion of unoccupied private dwellings (%)	12.6	15.3	15.6	13.2
Proportion of dwellings owned outright (%)	35.2	23.5	26.3	37.4
Proportion of dwellings	32.1	30.9	31.3	30.6

Measure	Denman SSC	Muswellbrook SSC	Muswellbrook LGA	Regional NSW
owned, with mortgage (%)				
Proportion of dwellings rented (%)	25.6	42.8	38.9	27.9
Proportion of households in rental stress (%)	8.2	15.0	13.0	10.8

6.10.2 Issues for consideration

An initial impact scoping exercise has been undertaken to gain an initial understanding of the likely socio-economic impacts and benefits of this Project (see Appendix D). From this, a key expected benefit are the economic impacts that are likely to be generated by construction, and to a lesser extent during operation, of the Project. Benefits to Denman, Muswellbrook and the wider Upper Hunter community would include local employment opportunities and stimulus to the local economy by construction staff spending money at local accommodation, local businesses (groceries, markets, shops), recreational facilities, and hospitality venues.

In order to gain a more comprehensive understanding of the likely impacts and benefits, the EIS will more deeply assess potential social and economic impacts of the Project, including issues perceived by the community to be of concern, and cumulative impacts of other proposed developments in the region.

Key social impacts and benefits identified during preliminary impact scoping and their intended level of assessment include:

Pre-construction (Project conception, assessment and engagement)

- Internal community division/cohesion – minor (as no evidence so far)
- Mental health, related to stress and anxiety associated with the planning/development process – minor (as no evidence so far)
- Real or perceived lack of inclusion or ability to influence decision-making and planning process – minor (as no evidence so far, and implementing robust engagement process)

Construction

- Increase in economic activity within the local area – detailed (as this has the potential to be a key benefit of the Project)
- Employment and labour benefits – detailed (as this has the potential to be a key benefit of the Project)
- Increased demand on housing and accommodation – standard (as cumulative impacts may apply)
- Increased demand on social infrastructure – standard (as cumulative impacts may apply)
- Changing sense of place and community – minor (as these communities are accustomed to development Projects)
- Impacts to public amenity and way of life – minor (determined by the scale of the Project)

All stages

- Changes in land use, including loss of agricultural land – standard (as cumulative impacts may apply)
- Changes in landscape character - standard (as cumulative impacts may apply)
- Establishment of community benefits scheme – standard (has the potential to be a key benefit of the Project)
- Potential changes to nearby property values – standard (as cumulative impacts may apply)

While the EIS phase activities will be influenced by the agreed Community and Stakeholder Engagement Strategy, and the stipulations of the SEARs, the engagement would focus on working

through issues, sharing the results of the various assessments, and confirming the design and construction details. A Social Impact Assessment as per the *Social Impact Assessment Guideline for State Significant Projects* (Department of Planning, Industry and Environment, 2021) will be prepared as part of the EIS.

Consultation to date is summarised in section 5 of this report and would continue into the operational stage of the Project.

6.11 Other environmental factors

6.11.1 Hydrology and groundwater

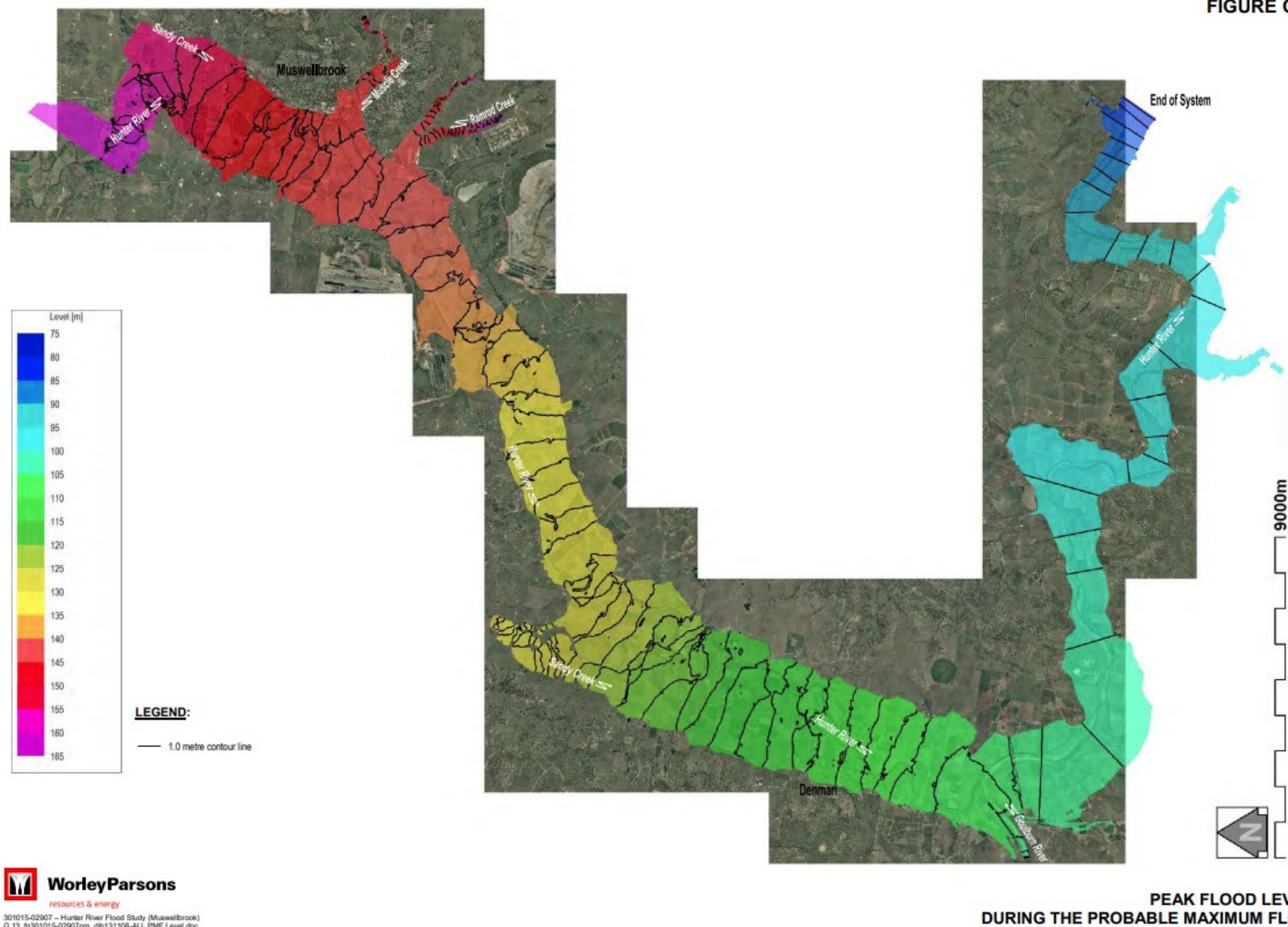
No permanent watercourses run through the Project site, nor is it within a flood planning area. A Flood Study of the Hunter River between Muswellbrook and Denman undertaken for Muswellbrook Shire Council in 2014 (WorleyParsons Services Pty Ltd, 2014) shows the Hunter River at the point of the Project would have a probable peak flood level of approximately 120 to 130 metres. Recent LiDAR surveys of the Project site indicate that less than 3.8% of the site has an elevation under 130 metres, and the lowest elevation on site is 123.8 metres. The flood level contour mapping provided in Figure 6-13 indicates that a substantial proportion of the modelled area is at risk of flooding during events up to and including the Probable Maximum Flood (PMF). The inundated floodplain area along the main channel of the Hunter River is typically over one kilometre wide for all events larger than the 10% annual exceedance probability (AEP) (WorleyParsons Services Pty Ltd, 2014). As the Project site is located over 1km from the Hunter River, it is not anticipated that it would be subject to floods greater than 10% AEP.

One groundwater borehole (GW201144) is located within the Project site.

Water quantities and sources required for construction and operation would be detailed in the EIS.

The EIS would assess impacts from the Project on groundwater and natural drainage lines, including appropriate mitigation measures. Water quantities and sources required for construction and operation would be detailed in the EIS as part of the Project description

FIGURE G.13



WorleyParsons
 resources & energy

301015-02907 - Hunter River Flood Study (Muswellbrook)
 G.13_fg301015-02907nm_gb131108-ALL PMF Level.doc

Figure 6-13 Predicted peak flood levels of the Hunter River (WorleyParsons Services Pty Ltd, 2014)

6.11.2 Hazards - Bushfire

The Project site is not mapped as bushfire prone land (BPL), with the closest mapped area of BPL being approximately 150m south-east, refer to Appendix A. The proposed construction and operational works can elevate fire ignition risks as a result of temperature changes and a mixture of weather and environmental conditions. Transport and handling also pose a risk for fire. It is acknowledged that the community will be interested in the safety aspects surrounding these types of projects and any hazards they may present, so a comprehensive hazard assessment will be undertaken to prove the safety of the infrastructure and equipment. This will assess compliance with relevant codes, standards and regulations and provide recommendations for minimizing hazards. Unlike smaller utilisations of battery products, a utility-scale BESS is held to a high standard of assessment and scrutiny, to ensure that the infrastructure and equipment selected is safe, and safeguards and processes are in place to ensure no harm can arise from failure.

The potential to increase risk of bushfire would be assessed in the EIS in accordance with the *Planning for Bushfire Protection Guideline 2019* (RFS, 2019). Emergency protocols would reflect advice from relevant agencies.

A PHA would be carried out in consideration with DPIE's *Hazardous Industry Planning Advisory Paper No. 6, 'Hazard Analysis'* (HIPAP 6) and *Multi-level Risk Assessment* (MLRA).

6.11.3 Hazards - Electric and magnetic fields (EMF)

EMFs are produced within the vicinity of existing powerlines. Additional infrastructure within the Project site such as inverters, connecting powerlines produce additional EMF within their vicinity.

The EMF levels associated with infrastructure are well below the guideline for public exposure and would not be expected to have any adverse impact on human health. There can, however, be perceived impacts for nearby residents.

EMF levels of the Project would be considered against safe exposure levels as part of the EIS. Standard design provisions are expected to ensure impacts comply with relevant guidelines together with communication of the issue as required.

6.11.4 Hazards – Glint and Glare

The closest airstrip to the Project site is located in Denman (Denman Farm Strip) (OurAirports, 2020), approximately 6.4 kilometres southwest of the Project site.

Solar panels are designed to absorb light and typically reflect less than 2% of incoming sunlight. However, at high incidence angles (e.g. when the sun is near the horizon and solar panels are positioned at relatively flat angles) solar panels can reflect up to 60% of incoming sunlight which can cause glare impacts. Glare impacts can cause annoyance if they persist for long periods of time and occur often throughout the year. However, this is not an issue in most circumstances and glare typically occurs for short periods of time in the winter months when the sun is lower in the sky. Glint related impacts from solar energy projects will typically be very brief and are unlikely to result in the levels of annoyance that can be generated from glare (DPIE, 2021a).

Concerns relating to glare have been raised for other solar Projects, and whilst this is a perceived issue, it would be considered in further assessment.

Potential for glare and reflections from solar farm infrastructure would be assessed in the EIS. Glare modelling software would be used to calculate the occurrence of glare for dwellings within 4km of the Project site, for key public viewpoints (including transport corridors) and airports.

Typical measures to mitigate impacts would include, vegetation screening, siting and orienting the solar panels to reduce the likely impacts of glint and glare, selecting infrastructure materials that minimise glint and glare.

6.11.5 Air quality

Air quality data sourced from DPIEs Air Quality Data Services is presented in Table 6-9 for the last 6 months (September 2020 – February 2021) at the Muswellbrook Monitoring Station. Only data for particles less than 10 micrometres diameter (PM10) is available for this time period.

Table 6-9 Air Quality data for Muswellbrook

Month	Particles PM10
Measurement	µg/m ³
September	18.7
October	19.5
November	24.9
December	19.2
January	18.5
February	15.9

Pm₁₀ Particles <50 are considered good, whilst Pm_{2.5} Particles <25 are considered good.

The Upper Hunter region has many coal mines so there is a potential for the air quality to be affected. The nearest mines including Mangoola, Bengalla and Mount Arthur Coal.

Mangoola Open Cut mine is the only mine located within approximately five kilometres of the Project site. Bengalla Open cut mine and Mount Arthur open cut mine are within 10km of the Project site.

6.11.6 Waste management

The Project would generate several waste streams and utilise a variety of materials during the construction phase, including:

- Excavated materials (soil).
- Packaging from solar panels and other infrastructure.
- Vegetation.

The EIS would demonstrate how waste management at all stages of the development will be minimised, how reuse and recycling will be optimised and quantify the expected amount of waste likely to be generated and where it would be disposed.

The EIS must would:

- Identify and quantify waste expected to be generated at each stage of the Project

- Recommend measure to reduce waste generation throughout all stages of the Project as well as end of life reuse, refurbishment and recycling strategies for PV panels that maximise high recovery methods
- Recommend a Waste Management Plan is incorporated into the CEMP, applying the principles to avoid, re-use and recycle to minimise wastes.

Appropriate mitigation measures may include:

- Selecting manufacturers and distributors of PV panels and infrastructure that minimise packaging and/or maximise the recyclable components of packaging
- Separating waste streams on site prior to transport to waste management facilities
- Ensuring all recyclable materials are sent to the appropriate recycling facilities and minimising waste sent to landfill
- Consulting with Council.

6.11.7 Cumulative impacts

The EIS will consider the impact of the project on the existing environment, including past changes to the environment and the combined effects of other developments currently in operation. Cumulative impact assessment however, builds on the findings of EIA to consider impacts from a proposed project in combination with other future projects that are anticipated or reasonably foreseeable. The cumulative impact assessment for a State significant project must be proportionate to the scale and potential significance of the cumulative impacts of the project combined with the impacts of other relevant future projects.

Major projects listed on the Major Projects Register within the Muswellbrook LGA (and their current status) are:

Table 6-10 Major Projects listed on the Major Projects Register

Project	Stage	Status
Maxwell solar farm		Determination – 19/08/2020
Maxwell Underground Coal Mine Project		Determination – 22/12/2020
Richard Gill School		Prepare Mod Report
Yarraman Abattoir and Feedlot		Prepare EIS
Spur Hill Underground Coal Project		Prepare EIS
Pacific Brook Christian School		SEARs
Mt Pleasant Coal	Mt Pleasant Optimisation Project	Response to Submission
Muswellbrook Landfill	Muswellbrook Landfill	Prepare EIS

Project	Stage	Status
Bowmans Creek Windfarm		Exhibition
Focono Quarry		Prepare EIS
HVO North Open Cut Coal	Continuation Project	Assessment
HVO North Open Cut Coal	Continuation Project	Prepare EIS
Bayswater Power Station	Bayswater Power Station Upgrade	Assessment
Liddell Battery and Bayswater Ancillary Works		Prepare EIS
Dalswinton Sand and Gravel Quarry		Prepare EIS
Mangoola Coal Continued Operations Project		Recommendation

Projects listed on the Regional Planning Portal within the Muswellbrook LGA (and their status inclusive of Projects determined since 2020) are:

Table 6-11 Major Projects listed on the Regional Planning Portal

Project	Address	Status
Waste Transfer Station	32-36 Glen Munro Road, Muswellbrook	Under assessment
Entertainment Facility	98 Bridge Street, Muswellbrook	Under assessment
Electricity Generating Works (solar farm) (Denman Road solar farm)	400 Denman Road, Denman	Determined (2021)
Electricity Generating Works (solar farm) (Sandy Hollow solar farm)	1333 Merriwa Road, Denman	Determined (2020)

Potential cumulative impacts of overlapping construction periods are primarily associated with traffic impacts, pressures on local facilities, goods and services and vegetation clearing.

The New England Highway would be used as the major haulage routes for major projects in the New England region including Tamworth and Armidale. Cumulative traffic impacts on the haulage route would be assessed for impacts from major projects such as Hills of Gold Wind Farm, Thunderbolt Energy Hub - Wind Farm, Middlebrook solar farm, Dungowan Dam, Tilbuster solar farm, Oxley solar farm, Oven Mountain Pumped Hydro Energy Storage Project, Doughboy Wind Farm and Rangoon Wind Farm.

Searches for nearby projects was limited to the Major Projects Register and Regional Planning Portal as these projects are generally of larger scale than projects captured under council development applications. The search indicated that the Denman Road solar farm is located within 5 km of the Project. Whilst the Denman Road solar farm was determined in September 2021, it is possible that there will be some construction overlap of the two projects, therefore cumulative impacts relating to traffic and noise would be required to be assessed within the EIS. Other potential cumulative impacts would be assessed within the EIS.

A cumulative impact scoping summary for projects likely to overlap with the Hunter River solar farm has been included in Appendix E as per the *Cumulative Impact Assessment Guidelines for State Significant Projects* (DPIE, 2021). The timing of works associated with the proposed developments nearby would be monitored throughout the EIS stage to ensure the assessment is as accurate as it can be and that appropriate mitigation measures are implemented, particularly in relation to construction traffic and pressure on local services and facilities within Denman and Muswellbrook.

7. Constraints Assessment

A constraints assessment has been carried out for the Project site, using the existing environment data as documented in Section 6.

Low, moderate and high environmental constraints are defined in Table 7-1 with the rating assessment provided in Table 7-2 in reference to the 'developability' of the Project site. Where uncertainty exists, a higher constraint rating has been applied. Further investigation may reduce the constraint level. Mapping of the identified environmental constraints was undertaken for the Project site and is provided in Figure 7-1 and Figure 7-2.

Table 7-1 Environmental Constraint Rankings

Constraint	Definition
Low	Minimal impacts anticipated. Most suitable for development. Standard management protocols would be sufficient to manage any impacts.
Moderate	Impacts should be minimised, where possible. These areas may require specific management protocols and may add some cost and time to the assessment and approval process.
High	Priority for further investigation. These areas may be difficult, expensive or may not be possible to obtain approval to develop. They may require costly additional surveys to understand and manage or offset impacts.

7.1 Constraint Assessment Results

Table 7-2 Constraint Assessment Ratings

Constraint	Description
Biodiversity	Low- Areas of derived native grassland.
	Moderate - Lower density treed areas up to 200m apart.
	High - Highest density treed areas including HBTs typically <50m apart. Includes areas of TEC.
Landscape and visual	Aerial imagery identified up to 61 receivers within a 5km buffer of the Project site are likely to have views of the Project including the solar array and onsite facilities and/ or be subject to visual impacts during construction/operation. Five non associated receivers within 1km of the Project would have direct views and would be highly sensitive to changes in viewshed from their property. Eight non associated receivers within 1-2km would have limited views depending on vegetation, structures and localised topography. Finally, dwellings on Roxburgh Road are located on a plateau and have

Constraint	Description
	views of Denman solar farm and may potentially have visibility of this Project. Consultation would be required, and landscape planting to screen the Project may be required at key viewpoints. A detailed assessment of the level of visual impact will be undertaken as part of the EIS process and would include viewshed analysis and consideration of the effectiveness of mitigation options. The methodology outlined in the <i>Visual Assessment Framework for Large-Scale Solar Energy Development</i> will be undertaken.
Noise and vibration	Noise and vibration, particularly during construction has potential to impact the surrounding sensitive receivers. A noise and vibration impact assessment would be required.
Land use compatibility	One coal exploring title held by Hunter Valley Energy Coal Pty Ltd (EL5965 (1992 Act)) is present within a portion of the Project site. The majority of the Project site is mapped as Grazing Native Vegetation
Soils and landforms	The majority of the Project site is Moderate capability land, LSC class 4 (93 ha). About 3% of the site is mapped BSAL, which is restricted to the northern corner of the Project site. CIC for Viticulture and Equine occur across the site. Level 1 and 2 Agriculture impact assessment and possibly Level 3 assessment may be required. Soil surveys will be undertaken to confirm the LSC classes and CIC and extent present in the Project site. There are no mapped areas of PASS/ASS and the locality is not within a mine subsidence district.
Aboriginal Heritage	Whilst there are no registered sites identified within the Project site, the AHIMS search identified 11 registered sites with a one-kilometre buffer of Lot 11 DP215827. An ACHA would be required to assess the impact on these sites and any unidentified sites within the Project site.
Access and traffic	Whilst Denman Road, New England Highway and the Golden Highway are all approved for 19 metres, 23 metres and 25/26 metre B-double routes, an assessment of site access would be required to confirm if intersection or road upgrades are required to meet Council or TfNSW guidelines. Construction traffic impacts would be considered in the EIS and take into consideration existing traffic volumes and any requirements from the road's authority.
Social and Economic	The Project would provide an economic benefit to the Upper Hunter Region through employment opportunities, and increased expenditure at local businesses by the construction teams. Any issues perceived from the community and cumulative impacts of other proposed developments would be assessed in the EIS.

Constraint	Description
Hydrology/Groundwater	No permanent watercourses run through the Project site, and it is not within a flood planning area One groundwater borehole (GW201144) is located within the Project site.
Contamination	As there are no known contamination issues within or adjacent to the Project site, it is unlikely there would be any significant concerns for the Project.
Hazard – Bushfire	The Project site is not mapped as bushfire prone land (BPL), with the closest mapped area of BPL being approximately 150 metres south-east. Potential for increased bushfire risk would be assessed in the EIS.
Hazard – EMF	EMF levels of the Project would be considered against safe exposure levels as part of the EIS.
Hazard – Glint and Glare	Any potential for glare and reflections from solar farm infrastructure on surrounding sensitive receivers and road traffic would be assessed in the EIS.
Non-Aboriginal Heritage	Whilst there are no non- Aboriginal heritage items within the Project site, ‘Piercefield’, a state listed heritage site is located adjacent the Project site. It is not expected that the Project would have a significant impact on Piercefield, however a SoHI would be required to assess any potential impacts.
Air Quality	Construction of the Project may generate dust during excavation and transport; however, these impacts would be managed through mitigation measures in the EIS. Operation of the Project is unlikely to affect the air quality, as solar panels do not generate any emissions.
Waste Management	The Project would not generate a large amount of waste, and a waste management plan would be incorporated into the CEMP to manage any waste that is generated.
Cumulative Impacts	An assessment of cumulative impacts would be undertaken as part of the EIS.

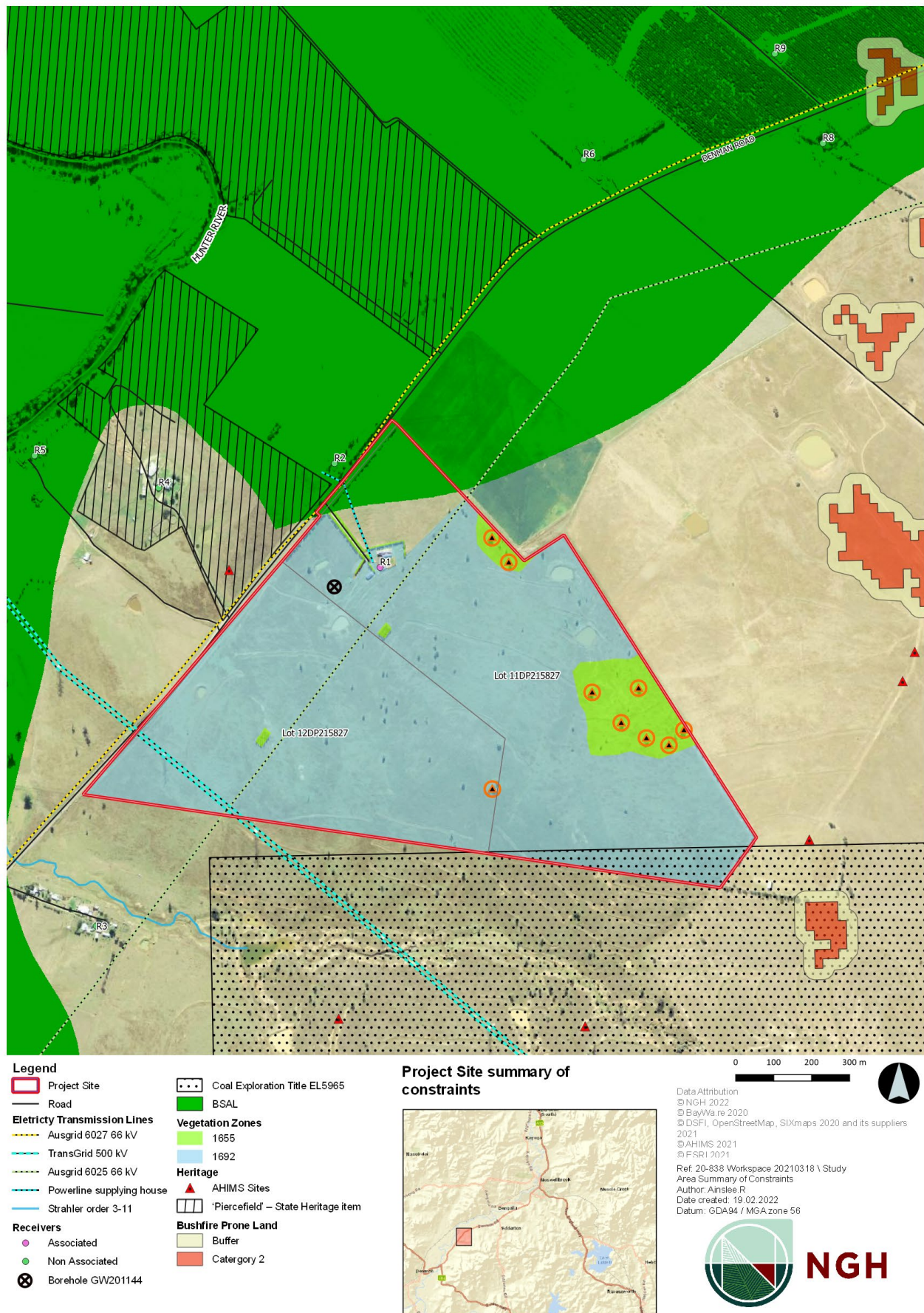


Figure 7-1 Summary of scoping assessment



Figure 7-2 Biodiversity; relative constraints

8. Conclusion and recommendations

This Scoping Report has outlined and established the planning and general environmental context of the Project. The Project would be assessed under Part 4 of the EP&A Act and classed as SSD under the Planning Systems SEPP.

The Scoping Report has categorised the potential environmental impacts of the Project. Based on this Scoping Report, an indicative scope for the EIS has been developed, focusing on the key issues:

- **Biodiversity**, in particular high constraint vegetation zones.
- **Landscape and visual**, particularly residential receivers within 1 km of the Project site and dwellings on Roxburgh Road.
- **Noise and vibration**, particularly residential receivers within 1 km of the Project site.
- **Land use compatibility**, particularly economic impacts to the region and rehabilitation of the site to its pre-development use.
- **Soil and landforms**, particularly BSAL/CIC and potential construction hazards.
- **Aboriginal heritage**, particularly the potential for significant sites and objects.
- **Non- Aboriginal heritage**, particularly the potential for impact on adjacent listed heritage sites.
- **Hazards – bushfire and battery storage**, particularly bushfire risk and hazard risk.
- **Access and traffic**, particularly potential requirement for road upgrades and intersection treatments.
- **Social and economic impacts** particularly potential impacts to surrounding localities in relation to cumulative construction impacts.

The EIS would be prepared in accordance with the Project-specific SEARs. Mitigation measures will be developed for inclusion in the EIS and will address the management of key issues and other issues identified in the assessment and community and stakeholder engagement process.

9. References

- .idcommunity. (2021, September). *Tamworth Regional Council*. Retrieved from Demographic resource centre: <https://profile.id.com.au/tamworth/about?WebID=10245100>
- ABS. (2021). *2016 Census Quickstats*. Retrieved from Australian Bureau of Statistics: https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/SSC11241
- AEMO. (2020). *Integrated System Plan (ISP)*. Retrieved from <https://aemo.com.au/en/energy-systems/major-publications/integrated-system-plan-isp>
- Australian Bureau of Statistics. (2016). *2016 Census QuickStats*. Retrieved from https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/SSC10289
- Australian Bureau of Statistics. (2021). *2016 Census QuickStats - Quirindi*. Retrieved from Census: [https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/SSC13301#:~:text=In%20the%202016%20Census%2C%20there,up%2012.4%25%20of%20the%20population.&text=The%20median%20age%20of%20people,State%20Suburbs\)%20was%2044%20years](https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/SSC13301#:~:text=In%20the%202016%20Census%2C%20there,up%2012.4%25%20of%20the%20population.&text=The%20median%20age%20of%20people,State%20Suburbs)%20was%2044%20years).
- BayWa r.e. (2020). *Company Information*. Retrieved from BayWa r.e.: <https://www.baywa-re.com.au/en/company/about-baywa-re/company-information/#about-baywa-re>
- BayWa r.e. (2021, June). Hunter River Solar Farm dwellings.
- Bitzios Consulting. (2020). *Denman Road Solar Park Traffic Impact Assessment*.
- Bureau of Meteorology. (2021, March). *Monthly mean daily global solar exposure*. Retrieved from http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=203&p_display_type=dataFile&p_startYear=&p_c=&p_stn_num=061168
- Burke, P. J., Best, R., & Jotzo, F. (2018, September). Closures of coal-fired power stations in Australia: Local unemployment effects. *CCEP Working Paper 1809*. The Australian National University.
- CEC. (2021). *Clean Energy Australia Report*. Retrieved from Clean Energy Council: <https://www.cleanenergycouncil.org.au/resources/resources-hub/clean-energy-australia-report>
- Clean Energy Council. (2021). *Clean Energy Australia Report 2021*. Retrieved from <https://www.cleanenergycouncil.org.au/resources/resources-hub/clean-energy-australia-report>
- Clean Energy Council. (2021, August). *Project Tracker*. Retrieved from <https://www.cleanenergycouncil.org.au/resources/project-tracker>
- Commonwealth of Australia. (2016). *Annual Report on the Performance of the Retail Energy Market*. Australian Energy Regulator.
- Community ID. (2016). *Lismore City | economic profile*. Retrieved from ID Community: <https://economy.id.com.au/lismore/value-of-agriculture>
- DECCW. (2010). *Aboriginal Cultural Heritage Consultation Requirements for Proponents*.

- Department of Environment & Climate Change. (2009). *Interim Construction Noise Guideline*. Sydney: Department of Environment & Climate Change.
- Department of Environment and Conservation NSW. (2006). *Assessing Vibration: a technical guideline*. Sydney: Department of Environment and Conservation NSW.
- Department of Environment, Climate Change and Water. (2011). *NSW Road Noise Policy*. Sydney: Department of Environment, Climate Change and Water.
- Department of Industry, Science, Energy and Resources. (2021, October 26). *Australia's Long-Term Emissions Reduction Plan*. Retrieved from <https://www.industry.gov.au/data-and-publications/australias-long-term-emissions-reduction-plan>
- Department of Planning, Industry and Environment. (2021). *Social Impact Assessment Guideline for State Significant Projects*.
- Department of Premier and Cabinet. (2011). *NSW 2021: A plan to Make NSW Number One*. Retrieved from https://www.ipc.nsw.gov.au/sites/default/files/file_manager/NSW2021_WEBVERSION.pdf
- DIS. (2015). *Energy White Paper*. Retrieved from www.ewp.industry.gov.au
- DoSER. (2020, September). *National Greenhouse Gas Inventory: Quarterly updates*. Retrieved from Department of Industry, Science, Energy and Resources: <https://www.industry.gov.au/sites/default/files/2021-02/nggi-quarterly-update-september-2020.pdf>
- DPIE. (2012). *Upper Hunter Strategic Regional Land Use Plan*.
- DPIE. (2017). *NSW Landuse 2017*. Retrieved from <https://data.gov.au/dataset/ds-nsw-de27e381-9595-4562-9347-b00e71d4c3bd/details?q=>
- DPIE. (2021 a). *Draft Large Scale Solar Energy Guideline*.
- DPIE. (2021). *Air quality data services*. Retrieved from <https://www.dpie.nsw.gov.au/air-quality/air-quality-data-services/data-download-facility>
- DPIE. (2021). *Cumulative Impact Assessment Guidelines for State Significant Projects*.
- DPIE. (2021). *State significant development guidelines - preparing a scoping report*.
- DPIE. (2021a). *Draft Large-Scale Solar Energy Guideline (December)*.
- Muswellbrook Shire Council*. (2021, January). Retrieved from REMPLAN: <https://app.remplan.com.au/muswellbrook/economy/industries/regional-exports?state=KLaJFA!O6gXComDpFQeWZ0tmnNRQcPFWSrSeBOC5ELE1iwQaQ2iohdkuEhpSppglS7ve>
- NGH Pty Ltd. (2021). *Community and Stakeholder Strategy Hunter River Solar Farm*.
- NSW Environment Protection Authority. (2017). *Noise Policy for Industry*.
- NSW Government. (2019). *NSW Electricity Strategy*. Retrieved from <https://www.energy.nsw.gov.au/government-and-regulation/electricity-strategy>
- NSW Government. (2021). *Electricity Infrastructure Roadmap*. Retrieved from <https://www.energy.nsw.gov.au/government-and-regulation/electricity-infrastructure-roadmap>

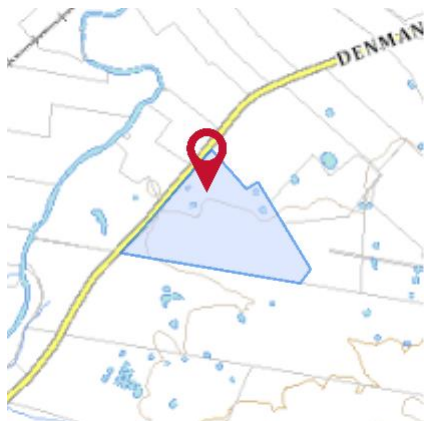
- NSW Government. (2022). *Hunter-Central Coast REZ Registration of Interest*. Retrieved from <https://www.energy.nsw.gov.au/hunter-central-coast-rez-registration-interest#-where-is-the-huntercentral-coast-rez->
- NSW Office of Environment and Heritage. (2012). *The land and soil capability assessment scheme*.
- Office of Environment and Heritage. (2011). *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales*. Office of Environment and Heritage, Department of Premier and Cabinet.
- OurAirports. (2020). *New South Wales, Australia*. Retrieved from <https://ourairports.com/countries/AU/NSW/>
- Prime Minister of Australia. (2021, October 26). *Australia's plan to reach our net zero target by 2050*. Retrieved from <https://www.pm.gov.au/media/australias-plan-reach-our-net-zero-target-2050>
- RFS. (2019). *Planning for Bushfire Protection*.
- Royal HaskoningDHV. (2017). *Hunter River Flood Study (Muswellbrook to Denman): Model Revisions Report*. Muswellbrook Shire Council.
- TfNSW. (2020). *NSW Combined Higher Mass Limits (HML) and Restricted Access Vehicle (RAV) Map*. Retrieved from <https://www.rms.nsw.gov.au/business-industry/heavy-vehicles/maps/restricted-access-vehicles-map/map/index.html>
- TfNSW. (2020). *Road Train Network Map v1.0*. Retrieved from <https://www.rms.nsw.gov.au/business-industry/heavy-vehicles/maps/road-train-map/index.html>
- TfNSW. (2021). *Traffic Volume Viewer*. Retrieved from <https://www.rms.nsw.gov.au/about/corporate-publications/statistics/traffic-volumes/aadt-map/index.html#/?z=13&lat=-32.452500473068014&lon=150.85382178198472&yr=2012>
- TransGrid. (2020). *Our Network*. Retrieved from TransGrid: <https://www.transgrid.com.au/what-we-do/our-network/Pages/default.aspx>
- WorleyParsons Services Pty Ltd. (2014). *Hunter River Flood Study (Muswellbrook to Denman)*. Muswellbrook Shire Council.

Appendix A Database searches



Property Report

1619 DENMAN ROAD DENMAN 2328



Property Details

Address: 1619 DENMAN ROAD DENMAN 2328
Lot/Section 11/-/DP215827 12/-/DP215827
/Plan No:
Council: MUSWELLBROOK SHIRE COUNCIL

Summary of planning controls

Planning controls held within the Planning Database are summarised below. The property may be affected by additional planning controls not outlined in this report. Please contact your council for more information.

Local Environmental Plans	Muswellbrook Local Environmental Plan 2009 (pub. 15-6-2012)
Land Zoning	RU1 - Primary Production: (pub. 15-6-2012)
Height Of Building	12 m
Floor Space Ratio	NA
Minimum Lot Size	80 ha
Heritage	NA
Land Reservation Acquisition	NA
Foreshore Building Line	NA

Detailed planning information

State Environmental Planning Policies which apply to this property

State Environmental Planning Policies can specify planning controls for certain areas and/or types of development. They can also identify the development assessment system that applies and the type of environmental assessment that is required.

This report provides general information only and does not replace a Section 10.7 Certificate (formerly Section 149)



- State Environmental Planning Policy (Affordable Rental Housing) 2009: Land Application (pub. 31-7-2009)
- State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004: Land Application (pub. 25-6-2004)
- State Environmental Planning Policy (Concurrences) 2018: Land Application (pub. 21-12-2018)
- State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017: Land Application (pub. 1-9-2017)
- State Environmental Planning Policy (Exempt and Complying Development Codes) 2008: Land Application (pub. 12-12-2008)
- State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004: Land Application (pub. 31-3-2004)
- State Environmental Planning Policy (Infrastructure) 2007: Land Application (pub. 21-12-2007)
- State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007: Land Application (pub. 16-2-2007)
- State Environmental Planning Policy (Primary Production and Rural Development) 2019: Land Application (pub. 28-2-2019)
- State Environmental Planning Policy No 21—Caravan Parks: Land Application (pub. 24-4-1992)
- State Environmental Planning Policy No 33—Hazardous and Offensive Development: Land Application (pub. 13-3-1992)
- State Environmental Planning Policy No 36—Manufactured Home Estates: Land Application (pub. 16-7-1993)
- State Environmental Planning Policy No 50—Canal Estate Development: Land Application (pub. 10-11-1997)
- State Environmental Planning Policy No 55—Remediation of Land: Land Application (pub. 28-8-1998)
- State Environmental Planning Policy No 64—Advertising and Signage: Land Application (pub. 16-3-2001)
- State Environmental Planning Policy No 65—Design Quality of Residential Apartment Development: Land Application (pub. 26-7-2002)

Other matters affecting the property

Information held in the Planning Database about other matters affecting the property appears below. The property may also be affected by additional planning controls not outlined in this report. Please speak to your council for more information

1.5 m Buffer around Classified
Roads

Classified Road Adjacent

Local Aboriginal Land Council

WANARUAH

This report provides general information only and does not replace a Section 10.7 Certificate (formerly Section 149)



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.

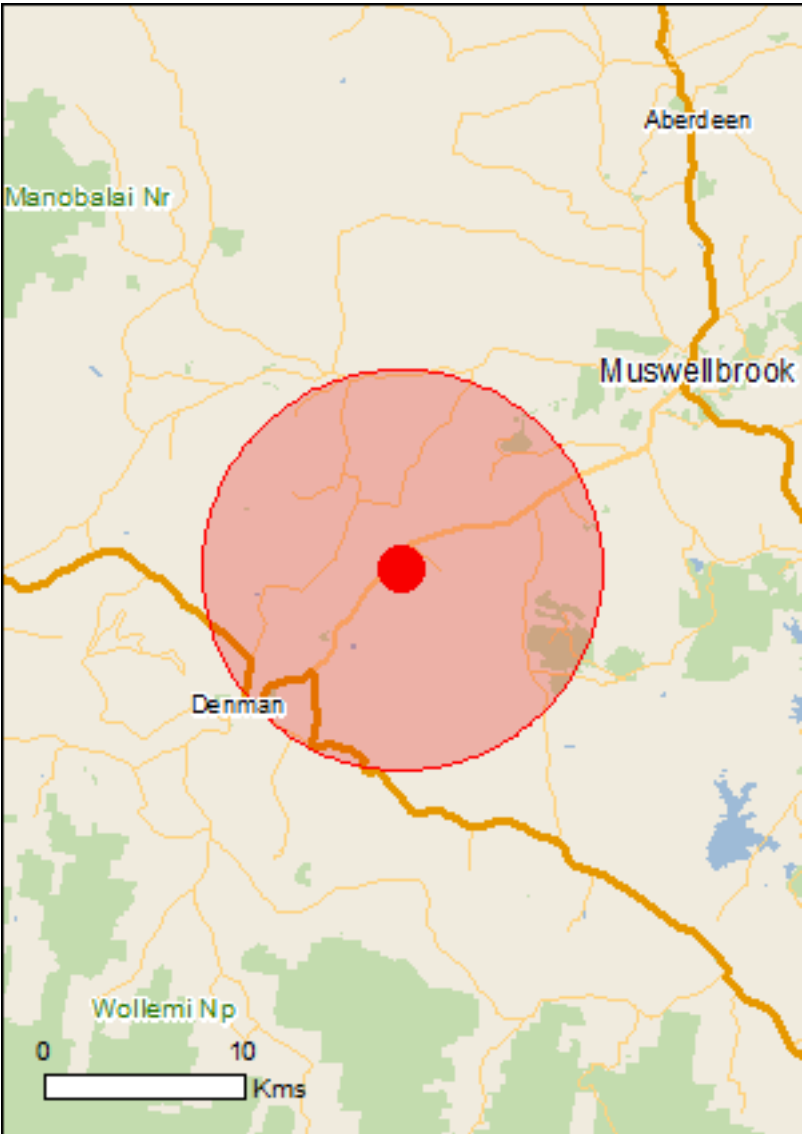
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 08/02/22 09:08:11

- [Summary](#)
- [Details](#)

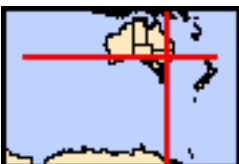
[Matters of NES](#)[Other Matters Protected by the EPBC Act](#)[Extra Information](#)
- [Caveat](#)
- [Acknowledgements](#)



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

[Coordinates](#)

Buffer: 10.0Km



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:	5
Listed Threatened Species:	33
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:	2
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:	31
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
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community may occur within area
Hunter Valley Weeping Myall (Acacia pendula) Woodland	Critically Endangered	Community may occur within area
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community may 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 may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Frogs		
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 rosea Sandy Hollow Commersonia [86861]	Endangered	Species or species habitat known to occur within area
Eucalyptus glaucina Slaty Red Gum [5670]	Vulnerable	Species or species habitat known to occur within area
Eucalyptus pumila Pokolbin Mallee [16510]	Vulnerable	Species or species habitat may occur within area
Euphrasia arguta [4325]	Critically Endangered	Species or species habitat may occur within area
Lasiopetalum longistamineum [19181]	Vulnerable	Species or species habitat known to occur within area
Pomaderris brunnea Rufous Pomaderris, Brown Pomaderris [16845]	Vulnerable	Species or species

Name	Status	Type of Presence
habitat may occur within area		
Pomaderris reperta Denman Pomaderris [77103]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum sp. Wybong (C.Phelps ORG 5269) a leek-orchid [81964]	Critically Endangered	Species or species habitat known to occur within area
Prostanthera cryptandroides subsp. cryptandroides Wollemi Mint-bush [68496]	Vulnerable	Species or species habitat likely to occur within 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		
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat likely to occur within area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat likely 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]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may 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 known 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

Name	Threatened	Type of Presence
Calidris melanotos Pectoral Sandpiper [858]	Critically Endangered	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]		Species or species habitat likely to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur 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]
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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 - Australian Telecommunications Commission
Defence - Myambat Barracks

Listed Marine Species	[Resource Information]
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* 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]	Critically Endangered	Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely 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]		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 likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur

Name	Threatened	Type of Presence
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		within area Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely 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 may 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
Neophema chrysostoma Blue-winged Parrot [726]		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 may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat known 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]
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Note that all areas with completed RFAs have been included.

Name	State
North East NSW RFA	New South Wales

Invasive Species	[Resource Information]
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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 may occur within area
Cylindropuntia spp. Prickly Pears [85131]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may 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 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

-32.33805 150.76042

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.

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[Department of Agriculture Water and the Environment](#)

GPO Box 858

Canberra City ACT 2601 Australia

+61 2 6274 1111

Data from the 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 (^A rounded to 0.1°; ^AA rounded to 0.01°). Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria : Licensed Report of all Valid Records of Threatened (listed on BC Act 2016) or Commonwealth listed Communities in selected area [North: -32.31 West: 150.68 East: 150.85 South: -32.46] returned 0 records for 22 entities.
Report generated on 8/02/2022 9:20 AM

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		Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3	V	K	
Community				Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner		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		Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast	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		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		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 and NSW North Coast Bioregions		Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	E3		K	
Community				Lower Hunter Valley Dry Rainforest in the Sydney Basin and NSW North Coast		Lower Hunter Valley Dry Rainforest in the Sydney Basin and NSW North Coast	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				Quorobolong Scribbly Gum Woodland in the Sydney Basin Bioregion		Quorobolong Scribbly Gum Woodland in the Sydney Basin Bioregion	E3		K	
Community				River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner		River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3	CE	K	
Community				Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East		Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3	E	K	
Community				Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner		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		P	
Community				Themeda grassland on seaciffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner		Themeda grassland on seaciffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions	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 - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and		White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and	E4B	CE	K	

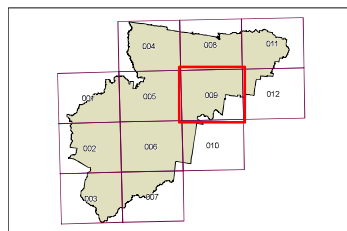
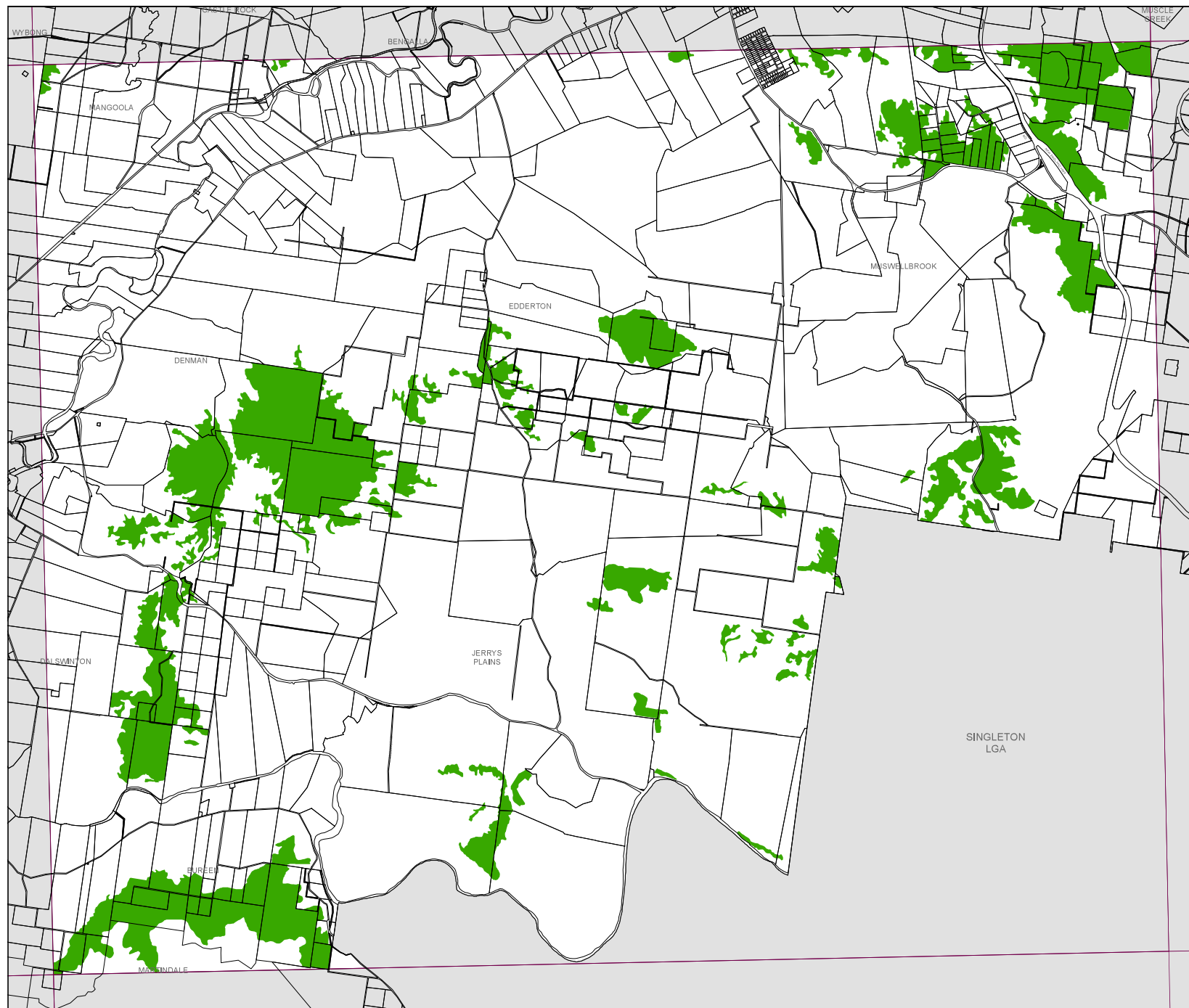


Muswellbrook Local Environmental Plan 2009

Terrestrial Biodiversity Map Sheet BIO_009

Biodiversity
 Biodiversity

Cadastre
 Cadastre 20/09/2010 © Land and Property Information (LPI)



N

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Scale: 80,000 @ A3

Projection: GDA 1994
MGA Zone 56

Map identification number: 5650_COM_BIO_009_080_20120328

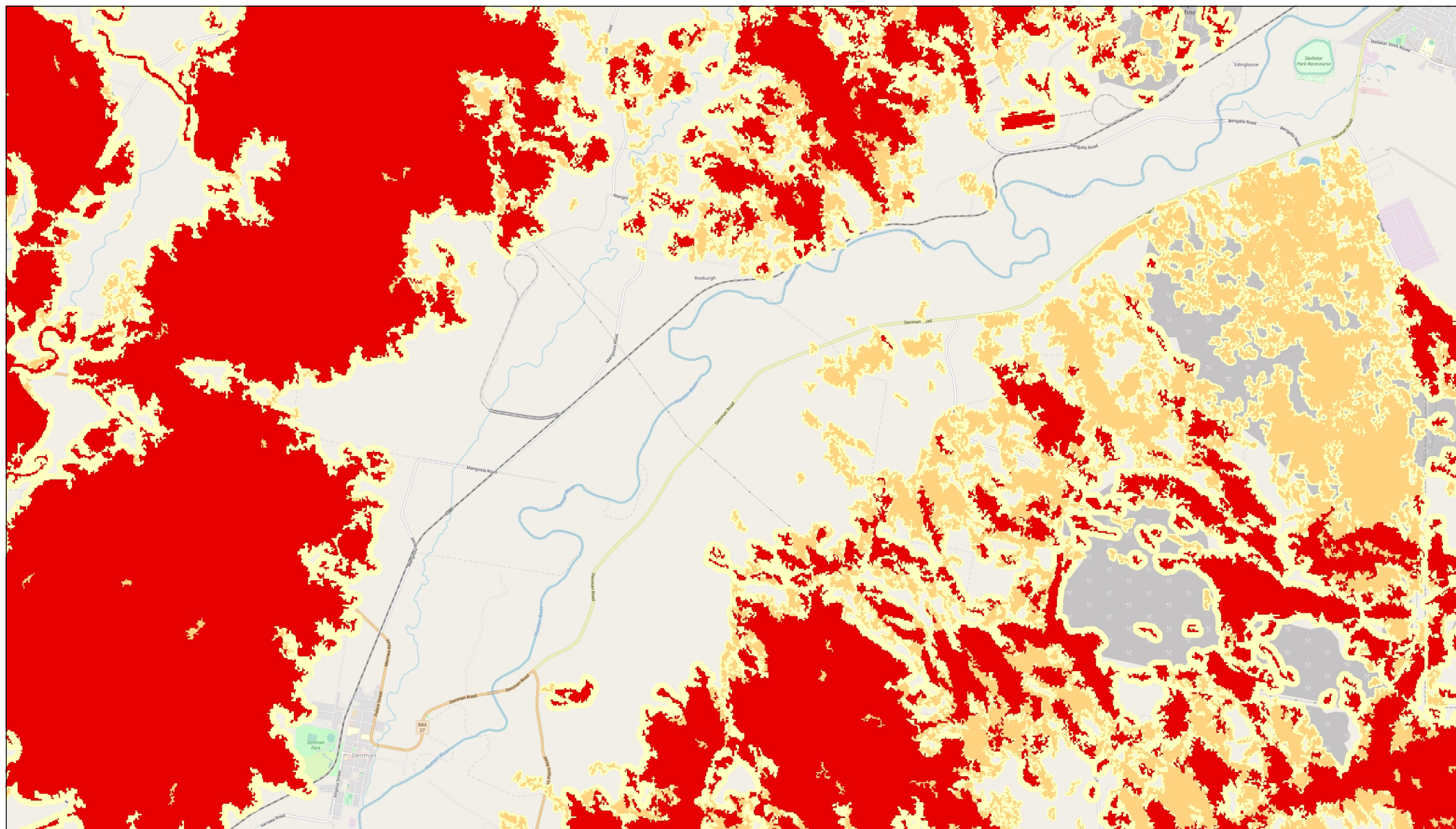


SEED

Sharing and Enabling Environmental Data

Bushfire prone land

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5.3 0 2.67 5.3 Kilometers

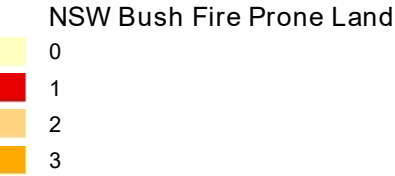
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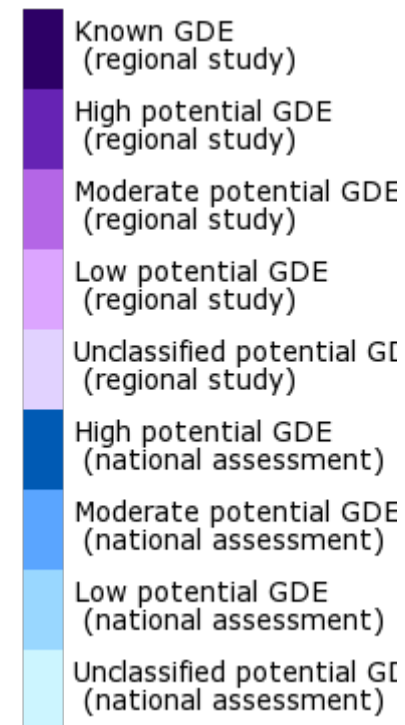
© OpenStreetMap contributors | Land and Property Information 2015 | Division of Resources & Energy | Department of Primary Industries NSW | Department of Primary Industries (Water) NSW | Office of Environment and Heritage NSW | Environment Protection Authority NSW | Department of Planning and Environment NSW | Geological Survey of NSW, 2016

Legend



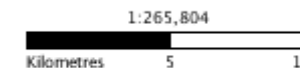


Aquatic GDE



World Imagery

Low Resolution 15m Imagery



Data Source: Bureau of Meteorology, Geoscience Australia and State/Territory lead water agencies. Refer to metadata for further information: [Click here](#)

Australian Albers GDA94



1619 Denman Road Denman 2328

Lot/Section/Plan no: 11/-/DP215827

Council: MUSWELLBROOK SHIRE COUNCIL



Layers



Legends

ePlanning Layers - Mapservice 8

State Environmental Planning Policies

SEPP (Mining, Petroleum Production and
Extractive Industries) 2007

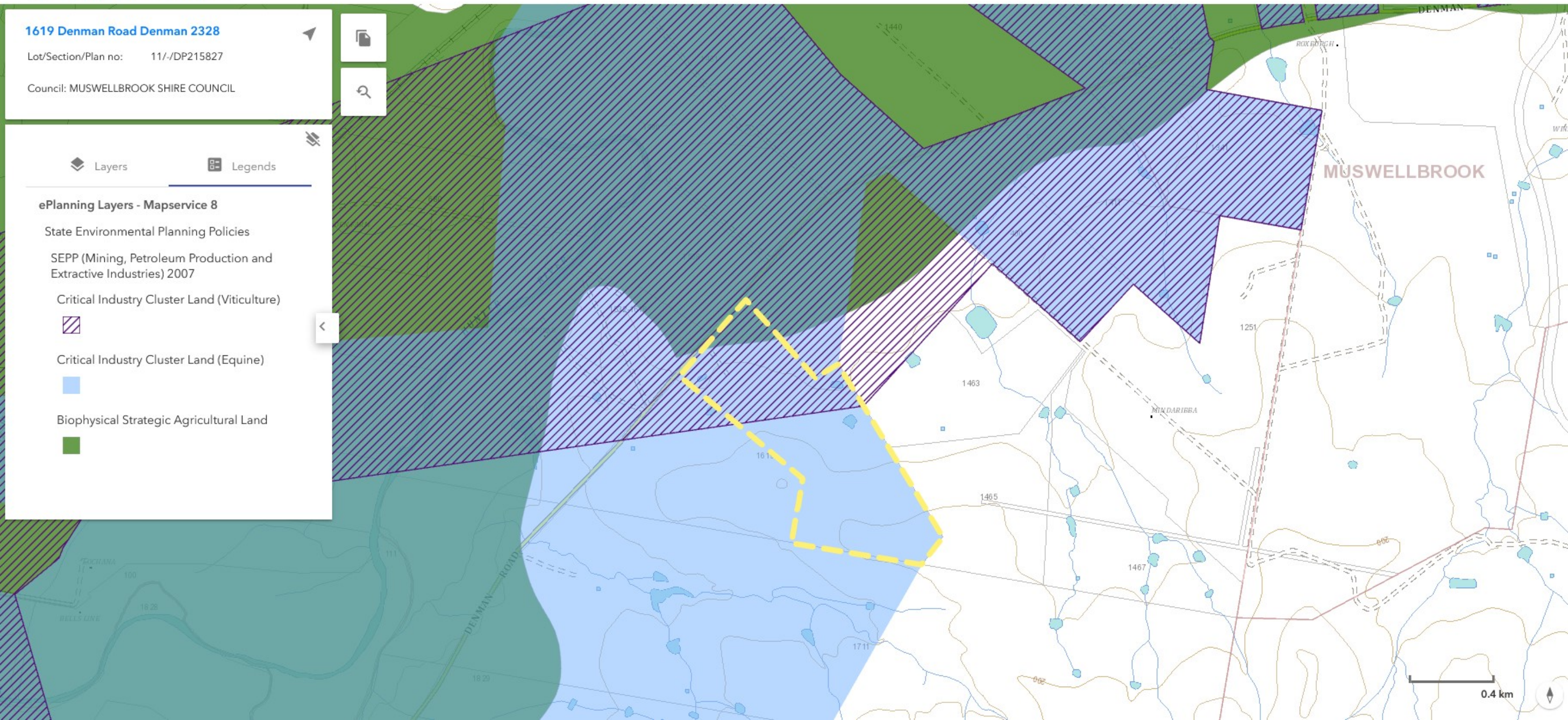
Critical Industry Cluster Land (Viticulture)



Critical Industry Cluster Land (Equine)



Biophysical Strategic Agricultural Land

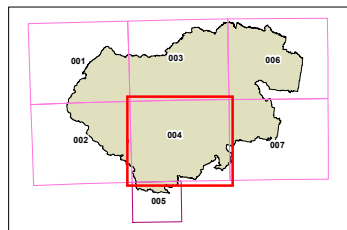


State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

Upper Hunter Region

Strategic Agricultural Land Map - Sheet STA_004

-  Biophysical Strategic Agricultural Land
-  Critical Industry Cluster Land (Viticulture)
-  Critical Industry Cluster Land (Equine)
-  Cadastre
-  Cadastre 12/2/2013 © Land and Property Information (LPI)

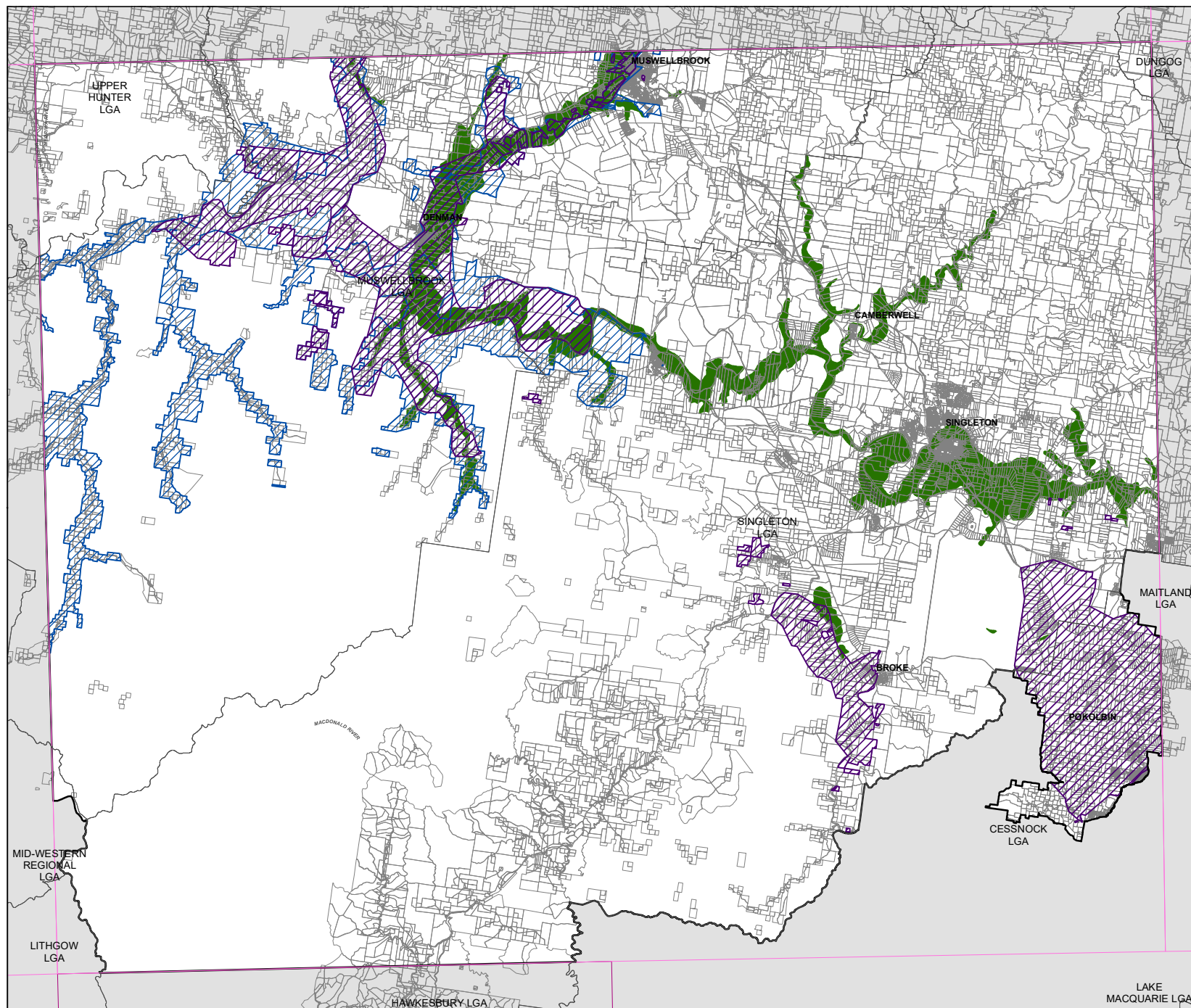


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Scale: 1:320,000 @ A3

Projection: GDA 1994
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Map identification number: SEPP_MPEI_UH_STA_004_320_20140407



1619 Denman Road Denman 2328

Lot/Section/Plan no: 11/-/DP215827

Council: MUSWELLBROOK SHIRE COUNCIL

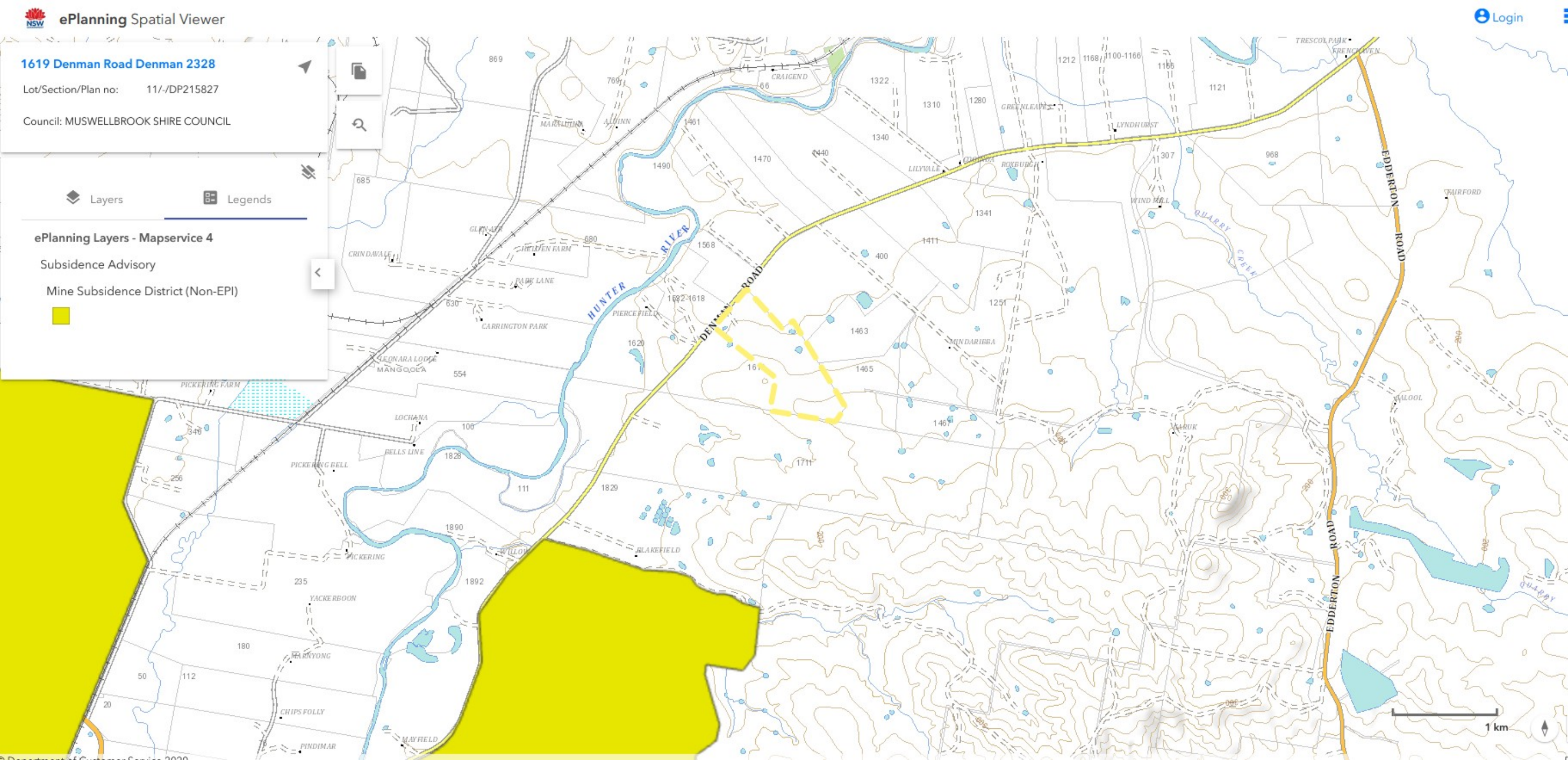
Layers

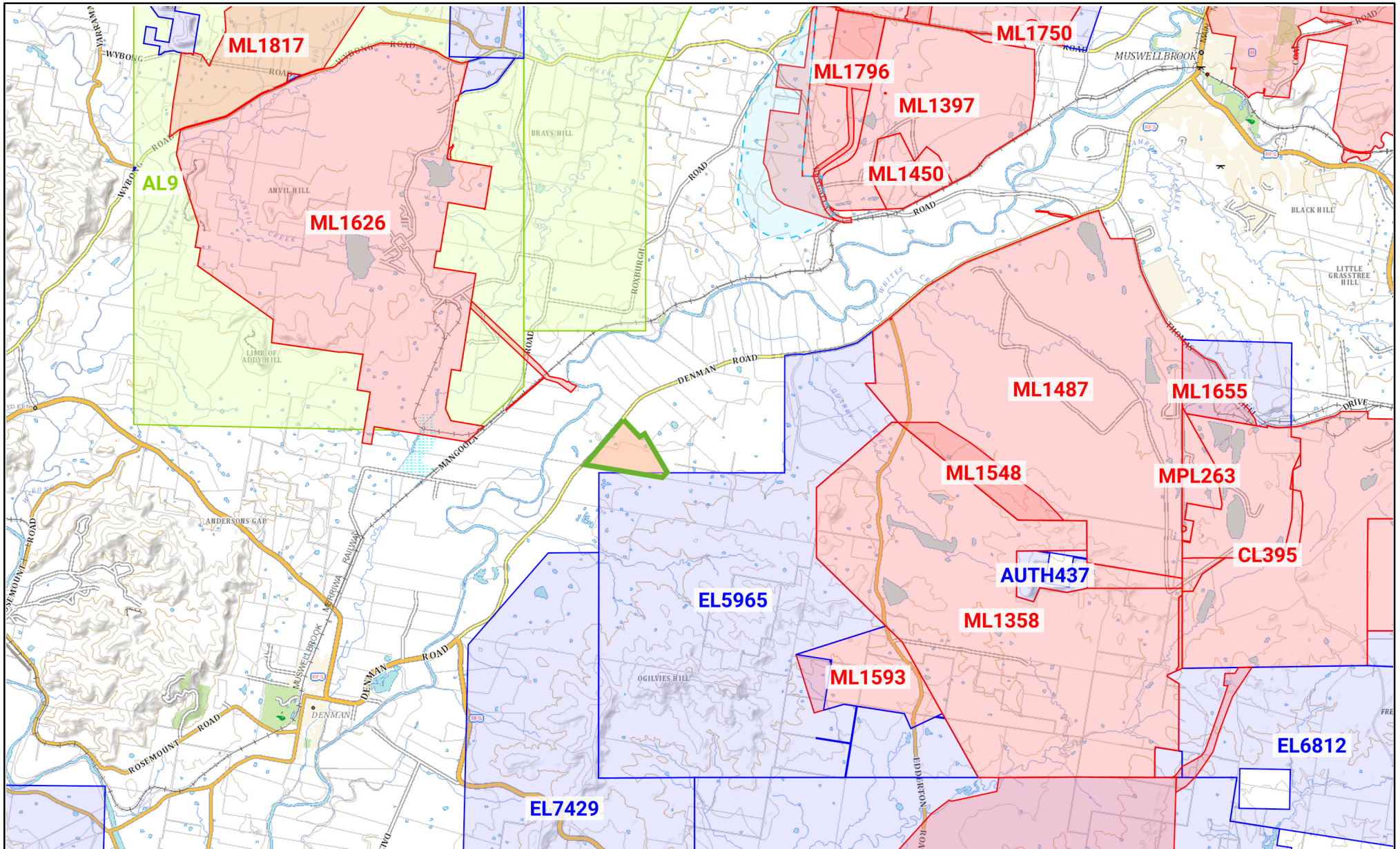
Legends

ePlanning Layers - Mapservice 4

Subsidence Advisory

Mine Subsidence District (Non-EPI)





Mining Titles

Contact: geoscience.products@planning.nsw.gov.au
Date Saved: 02/12/2021 04:57



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- Exploration Licence (EL)
- Assessment Lease (AL)
- Mining/Production Lease (CCL, ML, PPL)
- Exploration Lease Application (ELA)
- Assessment Lease Application (ALA)
- Mining/Production Lease Application (MLA, PPLA)

Legend



Contact: geoscience.products@planning.nsw.gov.au
Date Saved: 02/12/2021 04:57

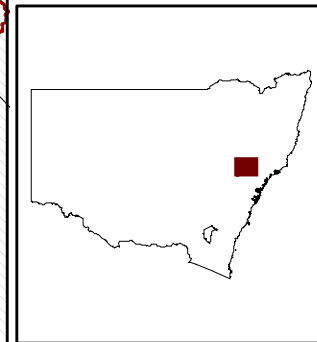
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Key Fish Habitat

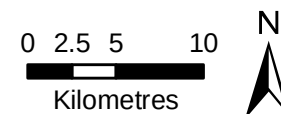
MUSWELLBROOK



Source: data from the Australian Geoscience, NSW DPI, NSW DECC and NSW LPI
Datum: Geocentric Datum of Australia (GDA)
Grid: Mapping Grid of Australia (MGA94)

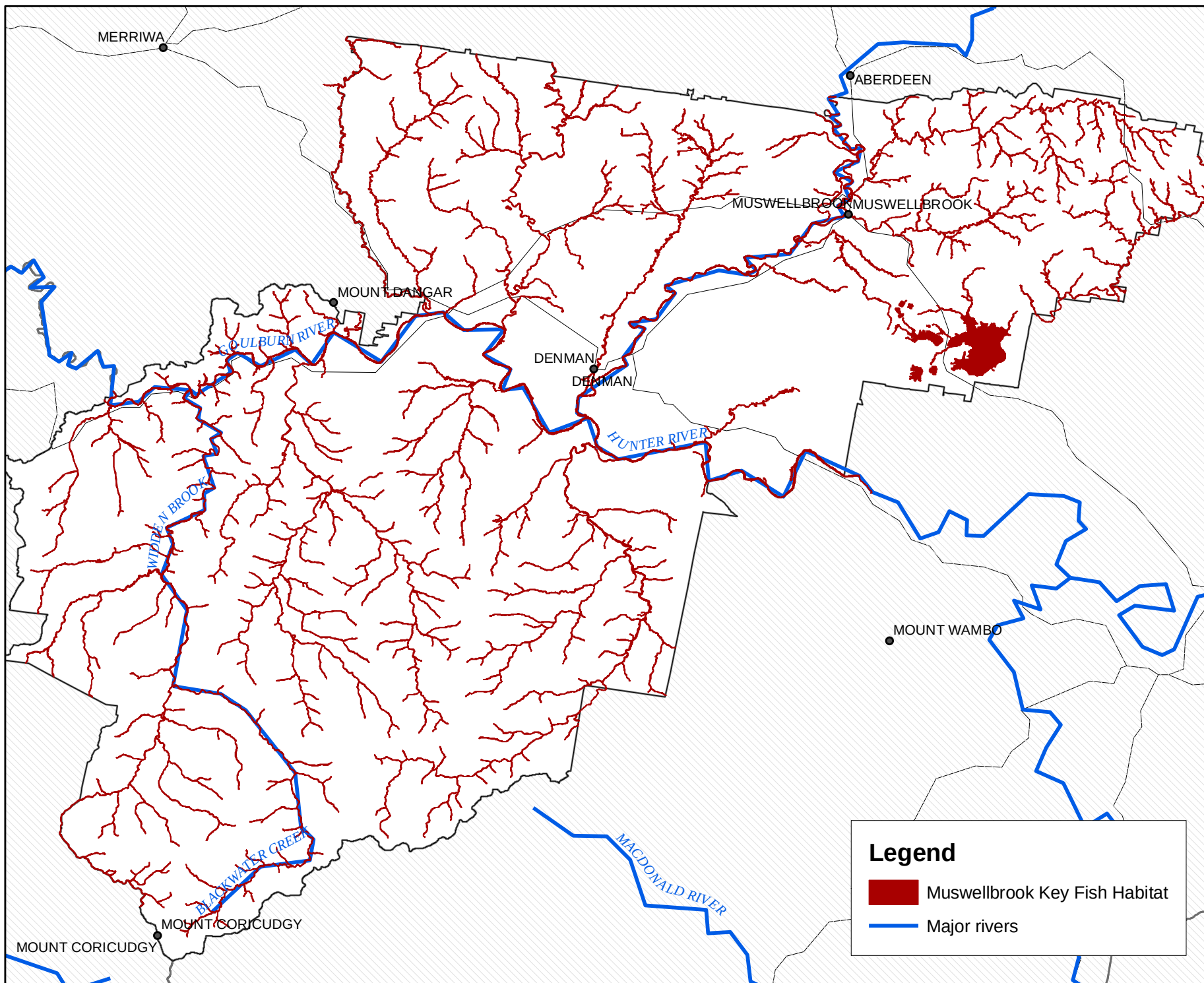
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Prepared by GIS section, Fisheries Ecosystems Branch, Division of Agriculture & Fisheries, NSW DPI.



Legend

-  Muswellbrook Key Fish Habitat
-  Major rivers





Terrestrial GDE (no data)



No ecosystems analysed

Terrestrial GDE



Known GDE
(regional study)

High potential GDE
(regional study)

Moderate potential GDE
(regional study)

Low potential GDE
(regional study)

Unclassified potential GDE
(regional study)

High potential GDE
(national assessment)

Moderate potential GDE
(national assessment)

Low potential GDE
(national assessment)

Unclassified potential GDE
(national assessment)

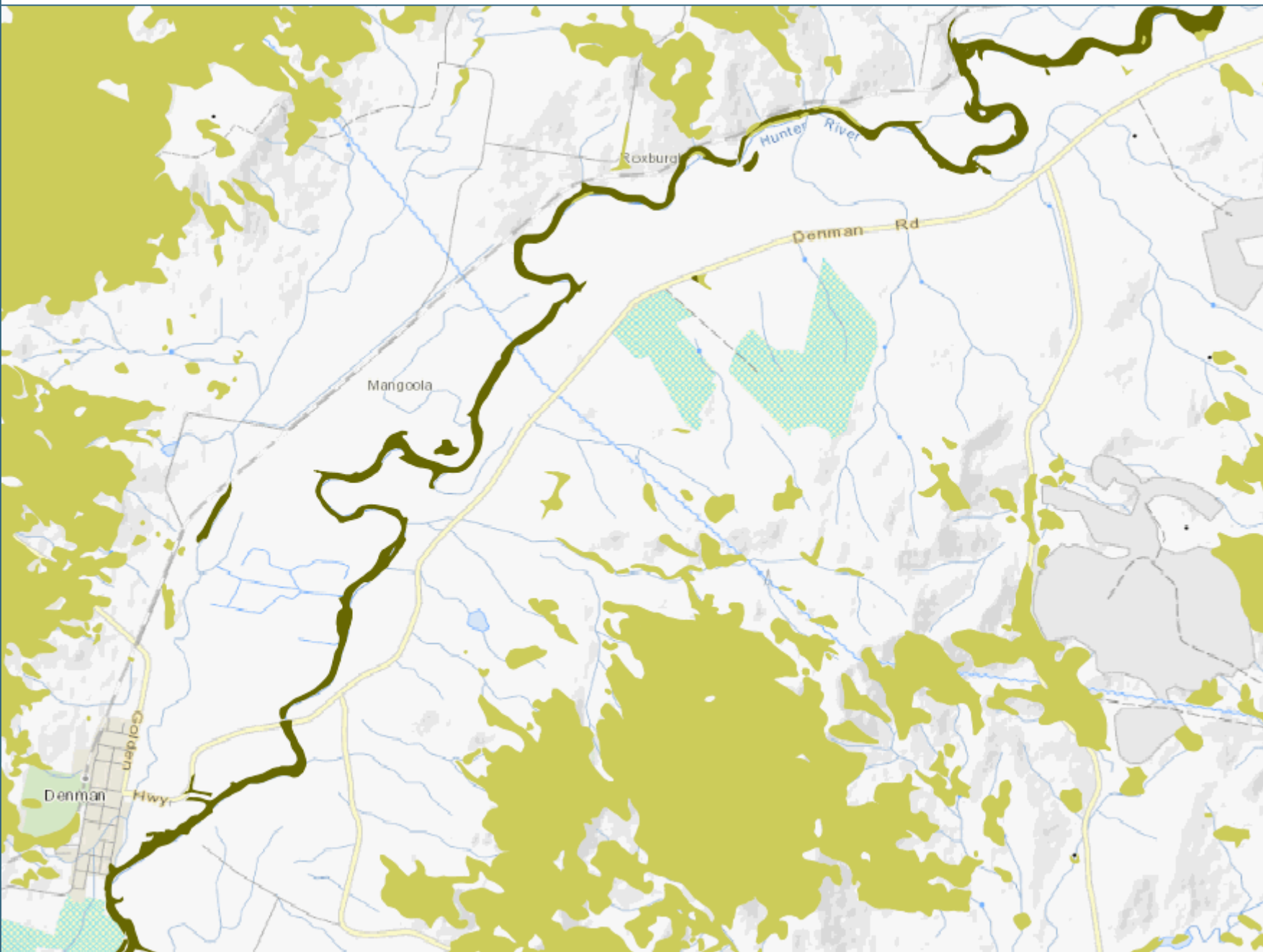


1:84,558
Kilometres 2

Data Source: Bureau of Meteorology, Geoscience Australia and State/Territory lead water agencies. Refer to metadata for further information: [Click here](#)

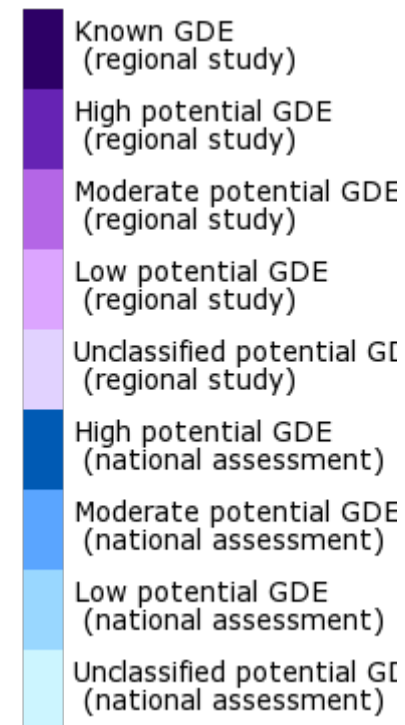
Australian Albers GDA94

Date: 26 September, 2021



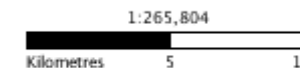


Aquatic GDE



World Imagery

Low Resolution 15m Imagery



Data Source: Bureau of Meteorology, Geoscience Australia and State/Territory lead water agencies. Refer to metadata for further information: [Click here](#)

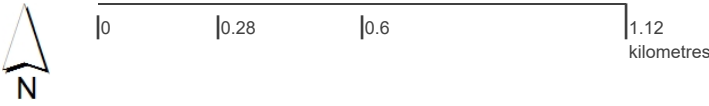
Australian Albers GDA94



Transitional Native Vegetation
Regulatory Map

Legend

- Cadastre
- Local Land Services Regions
- Local Government Area
- Native Vegetation Regulatory Map (in force)**
 - Category 2 - Vulnerable Regulated Land
 - Category 2 - Sensitive Regulated Land
 - Category 2 - Sensitive & Vulnerable Regulated Land
 - Land Excluded from Local Land Services Act 2013
 - Werriwa & Monaro CEEC Advisory Layer



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2019

Map extract date: 02-Dec-2021

Priority weeds for the Hunter

Note: this region includes the local council areas of Cessnock, Dungog, Lake Macquarie, Maitland, Mid-Coast, Muswellbrook, Newcastle, Port Stephens, Singleton and Upper Hunter.

[Select another region](#)

Weed

Duty

All plants

General Biosecurity Duty

*All plants are regulated with a **general biosecurity duty** to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.*

African boxthorn

Lycium ferocissimum

Prohibition on dealings

Must not be imported into the State or sold

African olive

Olea europaea subsp. *cuspidata*

Regional Recommended Measure

Land managers mitigate the risk of the plant being introduced to their land. Land managers reduce impacts from the plant on priority assets. Land managers prevent spread from their land where feasible. The plant or parts of the plant are not traded, carried, grown or released into the environment

Alligator weed

Alternanthera philoxeroides

Prohibition on dealings

Must not be imported into the State or sold

Alligator weed

Alternanthera philoxeroides

Biosecurity Zone

The Alligator Weed Biosecurity Zone is established for all land within the state except land in the following regions: Greater Sydney; Hunter (but only in the local government areas of City of Lake Macquarie, City of Maitland, City of Newcastle or Port Stephens).

Within the Biosecurity Zone this weed must be eradicated where practicable, or as much of the weed destroyed as practicable, and any remaining weed suppressed. The local control authority must be notified of any new infestations of this weed within the Biosecurity Zone

Anchored water hyacinth

Eichhornia azurea

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

Arrowhead

Sagittaria calycina var. *calycina*

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Asparagus fern

Asparagus virgatus

Regional Recommended Measure

Exclusion zone: whole of region except Newcastle and Lake Macquarie. Core infestation area: Newcastle and Lake Macquarie.

Whole of region: Land managers should mitigate the risk of new weeds being introduced to their land. Plant should not be bought, sold, grown, carried or released into the environment. Within exclusion zone: The plant should be eradicated from the land and the land kept free of the plant. Notify the Local Control Authority if found. Land managers should mitigate spread from their land. Within Core infestation: Land managers to reduce impacts from the plant on priority assets.

Athel pine

Tamarix aphylla

Prohibition on dealings

Must not be imported into the State or sold

Bellyache bush

Jatropha gossypifolia

Prohibition on dealings

Must not be imported into the State or sold

Bitou bush

Chrysanthemoides monilifera subsp. *rotundata*

Prohibition on dealings

Must not be imported into the State or sold

Bitou bush

Chrysanthemoides monilifera subsp.
rotundata

Biosecurity Zone

The Bitou Bush Biosecurity Zone is established for all land within the State except land within 10 kilometres of the mean high water mark of the Pacific Ocean between Cape Byron in the north and Point Perpendicular in the south.

Within the Biosecurity Zone this weed must be eradicated where practicable, or as much of the weed destroyed as practicable, and any remaining weed suppressed. The local control authority must be notified of any new infestations of this weed within the Biosecurity Zone

Black knapweed

Centaurea x moncktonii

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

Black willow

Salix nigra

Prohibition on dealings

Must not be imported into the State or sold

Blackberry

Rubus fruticosus species aggregate

Prohibition on dealings

Must not be imported into the State or sold

All species in the *Rubus fruticosus* species aggregate have this requirement, except for the varieties Black Satin, Chehalem, Chester Thornless, Dirksen Thornless, Loch Ness, Murrindindi, Silvan, Smooth Stem, and Thornfree

Blackberry

Rubus fruticosus species aggregate

Regional Recommended Measure

The plant should not be bought, sold, grown, carried or released into the environment. Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread from their land. Land managers to reduce impacts from the plant on priority assets.

Boneseed

Chrysanthemoides monilifera subsp.
monilifera

Prohibition on dealings

Must not be imported into the State or sold

Boneseed

Chrysanthemoides monilifera subsp.
monilifera

Control Order

Boneseed Control Zone: Whole of NSW

Boneseed Control Zone (Whole of NSW): Owners and occupiers of land on which there is boneseed must notify the local control authority of new infestations; immediately destroy the plants; ensure subsequent generations are destroyed; and ensure the land is kept free of the plant. A person who deals with a carrier of boneseed must ensure the plant (and any seed and propagules) is not moved from the land; and immediately notify the local control authority of the presence of the plant.

Boxing glove cactus

Cylindropuntia fulgida var. *mamillata*

Prohibition on dealings

Must not be imported into the State or sold

Bridal creeper

Asparagus asparagoides

Prohibition on dealings

Must not be imported into the State or sold

***this requirement also applies to the Western Cape form of bridal creeper**

Bridal veil creeper

Asparagus declinatus

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

Broomrapes

Orobanche species

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

All species of Orobanche are Prohibited Matter in NSW, except Clover broomrape, Orobanche minor and Australian broomrape, Orobanche cernua var. australiana.

Cabomba

Cabomba caroliniana

Prohibition on dealings

Must not be imported into the State or sold

Cabomba

Cabomba caroliniana

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Cane cactus

Austrocylindropuntia cylindrica

Prohibition on dealings

Must not be imported into the State or sold

All species in the *Austrocylindropuntia* genus have this requirement

Cape broom

Genista monspessulana

Prohibition on dealings

Must not be imported into the State or sold

Cat's claw creeper

Dolichandra unguis-cati

Prohibition on dealings

Must not be imported into the State or sold

Cat's claw creeper

Dolichandra unguis-cati

Regional Recommended Measure

The plant should not be bought, sold, grown, carried or released into the environment. Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread from their land. Land managers to reduce impacts from the plant on priority assets.

Chilean needle grass

Nassella neesiana

Prohibition on dealings

Must not be imported into the State or sold

Chilean needle grass

Nassella neesiana

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Chinese knotweed

Persicaria chinensis

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Chinese violet

Asystasia gangetica subsp. *micrantha*

Control Order

Owners and occupiers of land on which there is Chinese violet must notify the local control authority for the area if the Chinese violet is part of a new infestation on the land, destroy all Chinese violet on the land ensuring that subsequent generations of Chinese violet are destroyed; and keep the land free of Chinese violet. A person who deals with a carrier of Chinese violet must ensure the plant (and any seed and propagules) is not moved from the land; and immediately notify the local control authority of the presence of the plant on the land, or on or in a carrier.

Climbing asparagus

Asparagus africanus

Prohibition on dealings

Must not be imported into the State or sold

Climbing asparagus

Asparagus africanus

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Climbing asparagus fern

Asparagus plumosus

Prohibition on dealings

Must not be imported into the State or sold

Common pear

Opuntia stricta

Prohibition on dealings

Must not be imported into the State or sold

Coolatai grass

Hyparrhenia hirta

Regional Recommended Measure

The plant should not be bought, sold, grown, carried or released into the environment. Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread from their land. Land managers to reduce impacts from the plant on priority assets.

East Indian hygrophila

Hygrophila polysperma

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Espartillo - broad kernel

Amelichloa caudata

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Espartillo - narrow kernel

Amelichloa brachychaeta

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Eurasian water milfoil

Myriophyllum spicatum

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

Eve's needle cactus

Austrocylindropuntia subulata

Prohibition on dealings

Must not be imported into the State or sold

All species in the Austrocylindropuntia genus have this requirement

Fireweed

Senecio madagascariensis

Prohibition on dealings

Must not be imported into the State or sold

Flax-leaf broom

Genista linifolia

Prohibition on dealings

Must not be imported into the State or sold

Foxtail fern

Asparagus densiflorus

Prohibition on dealings

Must not be imported into the State or sold

Frogbit

Limnobium laevigatum

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

All species of Limnobium are Prohibited Matter

Gamba grass

Andropogon gayanus

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

Giant devil's fig

Solanum chrysotrichum

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Giant Parramatta grass

Sporobolus fertilis

Regional Recommended Measure

The plant should not be bought, sold, grown, carried or released into the environment. . Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread from their land. Land managers to reduce impacts from plant on priority assets.

Giant rat's tail grass

Sporobolus pyramidalis

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Glory lily.

Gloriosa superba

Regional Recommended Measure

Exclusion zone: whole region except core infestation area of the MidCoast, Port Stephens, Newcastle and Lake Macquarie local government areas

Whole region: The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found. Land managers should mitigate the risk of the plant being introduced to their land. Exclusion zone: The plant should be eradicated from the land and the land kept free of the plant. Core infestation area: Land managers should mitigate spread from their land.

Gorse

Ulex europaeus

Prohibition on dealings

Must not be imported into the State or sold

Gorse

Ulex europaeus

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Green cestrum

Cestrum parqui

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment. Land managers reduce impacts from the plant on priority assets.

Grey willow

Salix cinerea

Prohibition on dealings

Must not be imported into the State or sold

Ground asparagus

Asparagus aethiopicus

Prohibition on dealings

Must not be imported into the State or sold

Groundsel bush

Baccharis halimifolia

Regional Recommended Measure

*Land Area 1: core infestation within Newcastle, Greater Taree and Lake Macquarie. Land Area 2: rest of region
Land Area 1: Land managers should mitigate the risk of new weeds being introduced to their land. Land Area 2: The plant should be eradicated from the land and the land kept free of the plant. Notify the Local Control Authority if found. The plant should not be bought, sold, grown, carried or released into the environment.*

Hawkweeds

Pilosella species

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

All species in the genera *Pilosella* and *Hieracium* are Prohibited Matter except for *Hieracium murorum*.

Honey locust

Gleditsia triacanthos

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment. Land managers reduce impacts from the plant on priority assets.

Horsetails

Equisetum species

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

This Regional Recommended Measure applies to *Equisetum arvense*

Hudson pear

Cylindropuntia pallida

Prohibition on dealings

Must not be imported into the State or sold

Hydrocotyl

Hydrocotyle ranunculoides

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

Hygrophila

Hygrophila costata

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Hymenachne

Hymenachne amplexicaulis and hybrids

Prohibition on dealings

Must not be imported into the State or sold

Hymenachne

Hymenachne amplexicaulis and hybrids

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Karoo thorn

Vachellia karroo

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

Kidney-leaf mud plantain

Heteranthera reniformis

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Kochia

Bassia scoparia

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

Excluding the subspecies *trichophylla*

Koster's curse

Clidemia hirta

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

Kudzu

Pueraria lobata

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Lagarosiphon

Lagarosiphon major

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

Lantana

Lantana camara

Prohibition on dealings

Must not be imported into the State or sold

Leaf cactus

Pereskia aculeata

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Long-leaf willow primrose

Ludwigia longifolia

Regional Recommended Measure

Core infestation area: Newcastle, Lake Macquarie, Port Stephens and Mid Coast. Exclusion zone: Rest of region
Whole of region: The plant should not be bought, sold, grown, carried or released into the environment. Within Exclusion zone: Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. Within Core Infestation: Land managers to reduce impacts from the plant on priority assets.

Ludwigia

Ludwigia peruviana

Regional Recommended Measure

Land Area 1: Core infestation area of Port Stephens and Lake Macquarie. Land Area 2: rest of region
Land Area 1: Land managers should mitigate the risk of new weeds being introduced to their land. Land Area 2: The plant should be eradicated from the land and the land kept free of the plant. Notify the Local Control Authority if found. The plant should not be bought, sold, grown, carried or released into the environment.

Madeira vine

Anredera cordifolia

Prohibition on dealings

Must not be imported into the State or sold

Mahonia

Berberis lomariifolia

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Mesquite

Prosopis species

Prohibition on dealings

Must not be imported into the State or sold

All species in the genus *Prosopis* have this requirement

Mexican feather grass

Nassella tenuissima

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

Miconia

Miconia species

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

All species of *Miconia* are Prohibited Matter in NSW

Mikania vine

Mikania micrantha

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

***all species in the genus *Mikania* are Prohibited Matter in NSW**

Mimosa

Mimosa pigra

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

Mother-of-millions

Bryophyllum species

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment. Land managers reduce impacts from the plant on priority assets.

Mysore thorn

Caesalpinia decapetala

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Ox-eye daisy.

Leucanthemum vulgare

Regional Recommended Measure

Exclusion zone: whole region except for the core infestation area of the Barrington Tops Plateau

Whole region: The plant should not be bought, sold, grown, carried or released into the environment. Exclusion zone:

The plant should be eradicated from the land and the land kept free of the plant. Land managers should mitigate the risk of the plant being introduced to their land. Core infestation area: Land managers should mitigate spread from their land. Land managers to reduce impacts from the plant on priority assets.

Pampas grass

Cortaderia species

Regional Recommended Measure

Exclusion zone: Upper Hunter local government area. Core infestation area: Port Stephens, Maitland, Cessnock, Lack Macquarie, Newcastle and MidCoast local government areas.

Whole region: The plant should not be bought, sold, grown, carried or released into the environment. Exclusion zone:

The plant should be eradicated from the land and the land kept free of the plant. Land managers should mitigate the risk of the plant being introduced to their land. Core infestation area: Land managers should mitigate spread from their land. Land managers to reduce impacts from the plant on priority assets.

Parkinsonia

Parkinsonia aculeata

Prohibition on dealings

Must not be imported into the State or sold

Parkinsonia

Parkinsonia aculeata

Control Order

Parkinsonia Control Zone: Whole of NSW

Parkinsonia Control Zone (Whole of NSW): Owners and occupiers of land on which there is parkinsonia must notify the local control authority of new infestations; immediately destroy the plants; ensure subsequent generations are destroyed; and ensure the land is kept free of the plant. A person who deals with a carrier of parkinsonia must ensure the plant (and any seed and propagules) is not moved from the land; and immediately notify the local control authority of the presence of the plant.

Parthenium weed

Parthenium hysterophorus

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

Parthenium weed

Parthenium hysterophorus

Prohibition on dealings

The following equipment must not be imported into NSW from Queensland: grain harvesters (including the comb or front), comb trailers (including the comb or front), bins used for holding grain during harvest operations, augers or similar for moving grain, vehicles used to transport grain harvesters, support vehicles driven in paddocks during harvest operations, mineral exploration drilling rigs and vehicles used to transport those rigs, unless set out as an exception in Division 5, Part 2 of the Biosecurity Order (Permitted Activities) 2017

Paterson's curse

Echium plantagineum

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment. Land managers reduce impacts from the plant on priority assets.

Pond apple

Annona glabra

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

Prickly acacia

Vachellia nilotica

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

Prickly pears - Austrocyllindropuntias

Austrocyllindropuntia species

Prohibition on dealings

Must not be imported into the State or sold

All species in the *Austrocyllindropuntia* genus have this requirement

Prickly pears - Cylindropuntias

Cylindropuntia species

Prohibition on dealings

Must not be imported into the State or sold

All species in the *Cylindropuntia* genus have this requirement

Prickly pears - Opuntias

Opuntia species

Prohibition on dealings

Must not be imported into the State or sold

Except for *Opuntia ficus-indica* (Indian fig)

Rattlepod

Crotalaria beddomeana

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment. Land managers reduce impacts from the plant on priority assets.

Rope pear

Cylindropuntia imbricata

Prohibition on dealings

Must not be imported into the State or sold

All species in the *Cylindropuntia* genus have this requirement

Rubber vine

Cryptostegia grandiflora

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

Sagittaria

Sagittaria platyphylla

Prohibition on dealings

Must not be imported into the State or sold

Sagittaria

Sagittaria platyphylla

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment. Land managers reduce impacts from the plant on priority assets.

Salvinia

Salvinia molesta

Prohibition on dealings

Must not be imported into the State or sold

Salvinia

Salvinia molesta

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment. Land managers reduce impacts from the plant on priority assets.

This Regional Recommended Measure applies to *Salvinia molesta* and *Salvinia minima*

Scotch broom

Cytisus scoparius subsp. *scoparius*

Prohibition on dealings

Must not be imported into the State or sold

Scotch broom

Cytisus scoparius subsp. *scoparius*

Regional Recommended Measure

Exclusion zone: whole region except for the core infestation area of the Upper Hunter (Barrington Tops)

Whole region: The plant should not be bought, sold, grown, carried or released into the environment. Exclusion zone:

The plant should be eradicated from the land and the land kept free of the plant. Land managers should mitigate the risk of the plant being introduced to their land. Core

infestation area: Land managers to reduce impacts from the plant on priority assets.

Sea spurge

Euphorbia paralias

Regional Recommended Measure

Exclusion zone: whole region except for the core infestation area of Yaccaba Peninsula, Hawks Nest.

Whole region: The plant should not be bought, sold, grown, carried or released into the environment. Exclusion zone:

The plant should be eradicated from the land and the land kept free of the plant. Land managers should mitigate the risk of the plant being introduced to their land. Core

infestation area: Land managers should mitigate spread from their land. Land managers to reduce impacts from the plant on priority assets.

Senegal tea plant

Gymnocoronis spilanthoides

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Serrated tussock

Nassella trichotoma

Prohibition on dealings

Must not be imported into the State or sold

Serrated tussock
Nassella trichotoma

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Siam weed
Chromolaena odorata

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

Sicilian sea lavender
Limonium hyblaenum

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Sicklethorn
Asparagus falcatus

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Silverleaf nightshade
Solanum elaeagnifolium

Prohibition on dealings

Must not be imported into the State or sold

Silverleaf nightshade
Solanum elaeagnifolium

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Smooth tree pear
Opuntia monacantha

Prohibition on dealings

Must not be imported into the State or sold

Snakefeather
Asparagus scandens

Prohibition on dealings

Must not be imported into the State or sold

Snakefeather

Asparagus scandens

Regional Recommended Measure

Exclusion zone: Hunter region except Cessnock and Lake Macquarie. Core infestation area: Cessnock and Lake Macquarie

Whole of region: Land managers should mitigate the risk of new weeds being introduced to their land. The plant should not be bought, sold, grown, carried or released into the environment. Exclusion Zone: The plant should be eradicated from the land and the land kept free of the plant. Notify the Local Control Authority if found. Within Core infestation: Land managers to reduce impacts from the plant on priority assets.

Spongeplant

Limnobia spongia

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

All species of *Limnobia* are Prohibited Matter

Spotted knapweed

Centaurea stoebe subsp. *micranthos*

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

Tiger pear

Opuntia aurantiaca

Prohibition on dealings

Must not be imported into the State or sold

Tiger pear

Opuntia aurantiaca

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment. Land managers reduce impacts from the plant on priority assets.

Tropical soda apple

Solanum viarum

Control Order

Tropical Soda Apple Control Zone: Whole of NSW

Tropical Soda Apple Control Zone (Whole of NSW): Owners and occupiers of land on which there is tropical soda apple must notify the local control authority of new infestations; destroy the plants including the fruit; ensure subsequent generations are destroyed; and ensure the land is kept free of the plant. A person who deals with a carrier of tropical soda apple must ensure the plant (and any seed and propagules) is not moved from the land; and immediately notify the local control authority of the presence of the plant on the land, or on or in a carrier.

Velvety tree pear

Opuntia tomentosa

Prohibition on dealings

Must not be imported into the State or sold

Water caltrop

Trapa species

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

All species in the *Trapa* genus are Prohibited Matter in NSW

Water hyacinth

Eichhornia crassipes

Prohibition on dealings

Must not be imported into the State or sold

Water hyacinth

Eichhornia crassipes

Biosecurity Zone

The Water Hyacinth Biosecurity Zone applies to all land within the State, except for the following regions: Greater Sydney or North Coast, North West (but only the local government area of Moree Plains), Hunter (but only in the local government areas of City of Cessnock, City of Lake Macquarie, MidCoast, City of Maitland, City of Newcastle or Port Stephens), South East (but only in the local government areas of Eurobodalla, Kiama, City of Shellharbour, City of Shoalhaven or City of Wollongong).

Within the Biosecurity Zone this weed must be eradicated where practicable, or as much of the weed destroyed as practicable, and any remaining weed suppressed. The local control authority must be notified of any new infestations of this weed within the Biosecurity Zone

Water lettuce

Pistia stratiotes

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Water soldier

Stratiotes aloides

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

Water star grass

Heteranthera zosterifolia

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

White blackberry

Rubus niveus

Regional Recommended Measure

Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Willows

Salix species

Prohibition on dealings

Must not be imported into the State or sold

All species in the *Salix* genus have this requirement, except *Salix babylonica* (weeping willows), *Salix x calodendron* (pussy willow) and *Salix x reichardtii* (sterile pussy willow)

Witchweeds

Striga species

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

All species in the *Striga* genus are Prohibited Matter in NSW, except the native *Striga parviflora*

Yellow burrhead

Limnocharis flava

Prohibited Matter

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries

The content provided here is for information purposes only and is taken from the *Biosecurity Act 2015* and its subordinate legislation, and the Regional Strategic Weed Management Plans (published by each Local Land Services region in NSW). It describes the state and regional priorities for weeds in New South Wales, Australia.



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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 Heritage NSW.
- **Section 2** - contains heritage items listed by the **Heritage Council of NSW** under the Heritage Act. This includes listing on the State Heritage Register, an Interim Heritage Order or protected under section 136 of the Heritage Act. This information is provided by Heritage NSW.
- **Section 3** - contains items listed by **local councils** on Local Environmental Plans under the Environmental Planning and Assessment Act 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 Heritage Act.

Your search returned 1 record.

Item name	Address	Suburb	LGA	SHR
Merton	4883 Jerrys Plains Road	Denman	Muswellbrook	00159

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

Your search returned 47 records.

Item name	Address	Suburb	LGA	Information source
Army munitions base	495 Rosemount Road	Denman	Muswellbrook	LGOV
Baerami Homestead	Berami Road via Sandy Hollow	Denman	Muswellbrook	GAZ
Bakery	49 Ogilvie Street	Denman	Muswellbrook	LGOV
Cordial Factory (Demolished)	Muswellbrook Road	Denman	Muswellbrook	LGOV

Courthouse & Police Station, Former	Palace Street	Denman	Muswellbrook	GAZ
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
Former Anglican Church Rectory	21 Palace Street	Denman	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 private hospital	5 Crinoline Street	Denman	Muswellbrook	LGOV
Former school residence	80 Palace Street	Denman	Muswellbrook	LGOV
Glenmunro - slab kitchen	4372 Jerrys Plains Road	Denman	Muswellbrook	LGOV
Martindale	Martindale Road	Denman	Muswellbrook	GAZ
Martindale Homestead	1150 Martindale Road	Denman	Muswellbrook	LGOV
Merton	4883 Jerrys Plains Road	Denman	Muswellbrook	LGOV
Merton Cemetery		Denman	Muswellbrook	GAZ
Merton Cemetery	5052 Jerrys Plains Road	Denman	Muswellbrook	LGOV
Olinda		Denman	Muswellbrook	GAZ
Olinda (Demolished)	Merriwa Road	Denman	Muswellbrook	LGOV
Original buildings	Ogilvie,virginia Streets	Denman	Muswellbrook	SGOV
Pickering	221 Mangoola Road	Denman	Muswellbrook	LGOV
Pickering	Mangoola Road	Denman	Muswellbrook	GAZ
Piercefield and Outbuildings	1532-1618 Denman Road	Denman	Muswellbrook	LGOV
Police Residence, Former	Palace Street	Denman	Muswellbrook	GAZ
Portable Timber Lockup	Palace Street	Denman	Muswellbrook	GAZ
Railway Terminus Site	Turner Street	Denman	Muswellbrook	LGOV
Residence - Timber Cottage	12 Palace Street	Denman	Muswellbrook	LGOV
Roman Catholic Church	Palace Street	Denman	Muswellbrook	GAZ
Rosemount Winery	659 Rosemount Road	Denman	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
Rumbo Bush School	"Mayland"	Denman	Muswellbrook	LGOV

St Joseph's Hall	80 Palace Street	Denman	Muswellbrook	LGOV
St Matthias' Anglican Church	33-35 Palace Street	Denman	Muswellbrook	LGOV
St. Matthias Anglican Church	Palace Street	Denman	Muswellbrook	GAZ
Water Pumping Station (Demolished)	Palace Street	Denman	Muswellbrook	LGOV
Weatherboard Hall	50 Palace Street (Cnr Turtle Street)	Denman	Muswellbrook	LGOV
Woodlands Stud	3933 Woodlands Road	Denman	Muswellbrook	LGOV
Woodlands Stud	Woodlands Road	Denman	Muswellbrook	GAZ
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 48 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 Heritage NSW 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.

Piercefield and Outbuildings

Item details

Name of item:

Piercefield and Outbuildings

Type of item:

Built

Group/Collection:

Farming and Grazing

Category:

Homestead Complex

Primary address:

1532-1618 Denman Road, Denman, NSW 2328

Local govt. area:

Muswellbrook

All addresses

Street Address	Suburb/town	LGA	Parish	County	Type
1532-1618 Denman Road	Denman	Muswellbrook			Primary Address
1532 Denman Road	Denman	Muswellbrook			Alternate Address

Statement of significance:

The significance of the home is substantially compromised by the unsympathetic additions. It remains of state historical significance for its association with a major local pioneering wool-growing family for the fact that the outbuildings remain from that earliest period and for its significance in the development of regional horse racing. For its association with regional horse racing and breeding it has regional social significance.

Note: The State Heritage Inventory provides information about heritage items listed by local and State government agencies. The State Heritage Inventory is continually being updated by local and State agencies as new information becomes available. Read the Department of Premier and Cabinet [copyright](#) and [disclaimer](#).

Description

Designer/Maker:

Unknown

Builder/Maker:

Unknown

Physical description:

Decorative brickwork to gables.

Modifications and dates:

Architectural Style: Victorian Gothic Construction Year: c.1860 Modifications: Verandahs added and more recent addition of extensive skillion-roofed brick verandah.

d

Further information:

Elderly owners cannot keep up repairs, outbuildings in bad condition; unsympathetic additions to stable building; evidence of old farming machinery.

History

Historical notes:

Piercefield was originally promised to William Carter, but in 1837 James Brindley Bettington received the deeds to the property. Bettington had studied Merino sheep in Germany and had imported his own Saxon sheep to Australia, eventually bringing them to Piercefield. Bettington increased the size of the property holding to 20,000 acres. Between the 1870s and 1910s James Withycombe owned the property. The next owner, A. Gilder, reduced the property to 2,000 acres from its original 20,000 acres. Then in 1968 there was another change of hands to Mr John Lowe who is the current owner.

Listings

Heritage Listing	Listing Title	Listing Number	Gazette Date	Gazette Number	Gazette Page
State Environmental Planning Policy	EJE-1996				
Local Environmental Plan	Muswellbrook Local Environmental Plan 2009	113	17 Apr 09		
Heritage study	Other: REP 1989 SCHEDULE 4 Review				

Study details

Title	Year	Number	Author	Inspected by	Guidelines used
Muswellbrook Heritage Study	1996	Form date: 2nd May 1995	EJE		N o

References, internet links & images

Type	Author	Year	Title	Internet Links
Written			Muswellbrook Historical Society Records; Patrick White - A Life , David Marr	

Note: internet links may be to web pages, documents or images.

Data source

The information for this entry comes from the following source:

Name:

Local Government

Database number:

2120024

File number:

DENM/R016

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Every effort has been made to ensure that information contained in the State Heritage Inventory is correct. If you find any errors or omissions please send your comments to the [Database Manager](#).

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Search Results

6 results found.

Denman Courthouse (former) Palace St	Denman, NSW, Australia	(Registered) 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)
Pickering and Outbuildings 221 Mangoola Rd	Denman, 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)
Wollemi National Park (1980 boundary) The Putty Rd	Singleton, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)

Report Produced: Wed Mar 31 13:03:32 2021

[Home](#) [Public registers](#) [Contaminated land record of notices](#)

Search results

Your search for: Suburb: DENMAN

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 Again](#)

[Refine Search](#)

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. [POEO public register](#)

8 February 2022

For business and industry ^

For local government ^

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131 555 (tel:131555)

Online (<https://yoursay.epa.nsw.gov.au/epa-website-feedback>)

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>)

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Suburb	SiteName	Address	ContaminationActivityType	ManagementClass	Latitude	Longitude
DENILIQUIN	BP Depot (Reliance Petroleum)	125 - 127 Hardinge STREET	Service Station	Regulation under CLM Act not required	-35.53222124	144.9517397
DENILIQUIN	Former Shell Depot	143-147 Napier STREET	Other Petroleum	Regulation under CLM Act not required	-35.5342355	144.953169
DENILIQUIN	Previous Council depot site	392 - 394 Hay ROAD	Unclassified	Under assessment	-35.518857	144.977947
DENMAN	Former Industrial Site	10 Fontana WAY	Metal Industry	Regulation under CLM Act not required	-32.37945456	150.6868239
DENMAN	Former Industrial Site	9 Fontana WAY	Metal Industry	Regulation under CLM Act not required	-32.37911159	150.6869866
DORA CREEK	Former Service Station	4 Doree PLACE	Service Station	Regulation under CLM Act not required	-33.08452746	151.502415
DOUBLE BAY	64 Suttie Road, Double Bay NSW 2028	64 Suttie ROAD	Other Industry	Regulation under CLM Act not required	-33.885034	151.247311
DOYALSON	Part Lot 3 DP 259306	Off David STREET	Other Industry	Regulation under CLM Act not required	-33.20436131	151.5232558
DOYALSON	Munmorah Power Station	(Central Coast Highway) Scenic DRIVE	Other Industry	Under assessment	-33.20678347	151.540795
DOYALSON	Manning Colliery (formerly Wyee)	Rutleys ROAD	Other Industry	Regulation under CLM Act not required	-33.17179576	151.5419248
DOYALSON NORTH	Caltex Service Station	235 Pacific HIGHWAY	Service Station	Regulation under CLM Act not required	-33.18501024	151.5526114
DOYALSON NORTH	Shell Coles Express Service Station	260-270 Pacific HIGHWAY	Service Station	Regulation under CLM Act not required	-33.18636608	151.5482399
DRUMMOYNE	Coles Express Service Station Drummoyne (Eastbound)	36-46 Victoria ROAD	Service Station	Regulation under CLM Act not required	-33.85576628	151.1593519
DRUMMOYNE	Former Dry Cleaners	225 Victoria ROAD	Chemical Industry	Regulation under CLM Act not required	-33.8507152	151.1537113
DRUMMOYNE	Coles Express Service Station Drummoyne South (Westbound)	39-45 Victoria ROAD	Service Station	Regulation under CLM Act not required	-33.85606575	151.1589061



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Summary

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Results - Individual Facility Detail

2018/2019 report for ORICA AUSTRALIA PTY LTD, Orica Bayswater Mining Services Plant - Muswellbrook, NSW

Click on the tabs for further details of this facility's report

Report Details:	Reporting Year:	2018/2019
	Subthreshold Report:	No
	Data period start:	July 1, 2018
	Data period end:	June 30, 2019
Other reports for this facility:	2017/2018 , 2016/2017 , 2015/2016 , 2014/2015 , 2013/2014 , 2012/2013 , 2011/2012 , 2010/2011 , 2009/2010 , 2008/2009 , 2007/2008 , 2006/2007 , 2005/2006 , 2004/2005 , 2003/2004 , 2002/2003 , 2001/2002	
Facility Details:	Facility Name:	Orica Bayswater Mining Services Plant
	Jurisdiction ID:	663
	Street Address:	McArthur Road Muswellbrook NSW 2333
	Number of Employees:	10
Owner/Operator Details:	Company Name:	ORICA AUSTRALIA PTY LTD
	ABN:	99004117828
	ACN:	004117828
Contact Details:	Name / Position:	Specialist – SHES APA, Environment
	Phone:	0418 215 221
	Email:	sustainability.team@orica.com
	Postal Address:	PO Box 196 Kurri Kurri NSW 2327
	Web Address:	
Industry Details:	Main Activities:	Dangerous good storage depot for ammonium nitrate, ammonium nitrate emulsion and diesel to support bulk explosives delivery to mines
	Primary ANZSIC:	
	Class:	Explosive Manufacturing [1892]
	Group:	Other Basic Chemical Product Manufacturing [189]
Public Statement:		
First published:	March 31, 2020	
Last updated:	March 31, 2020	

Display time: 0.033s

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NPI

- [NPI Home](#)
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Search Criteria

- Source Type = All
- Include subthreshold facility data = Yes
- Reporting year = 2018/2019
- State = National
- LGA = MUSWELLBROOK
- Substance = All
- Destination type = All

[Edit Criteria](#)

Drill Down Criteria

- Jurisdiction Id = 663

[Remove](#)

Key

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Results - Individual Facility Detail

2018/2019 report for BENGALLA MINING COMPANY PTY LIMITED, Bengalla Operations - Muswellbrook, NSW

Click on the tabs for further details of this facility's report

Report Details:	Reporting Year: Subthreshold Report: Data period start: Data period end:	2018/2019 No July 1, 2018 June 30, 2019	
Other reports for this facility:	2017/2018 , 2016/2017 , 2015/2016 , 2014/2015 , 2013/2014 , 2012/2013 , 2011/2012 , 2010/2011 , 2009/2010 , 2008/2009 , 2007/2008 , 2006/2007 , 2005/2006 , 2004/2005 , 2003/2004 , 2002/2003 , 2001/2002 , 2000/2001 , 1999/2000		
Facility Details:	Facility Name: Jurisdiction ID: Street Address: Number of Employees:	Bengalla Operations 393 Bengalla Road Muswellbrook NSW 2333 445	
Owner / Operator Details:	Company Name: ABN: ACN:	BENGALLA MINING COMPANY PTY LIMITED 32053909470	
Contact Details:	Name / Position: Phone: Email: Postal Address: Web Address:	Mr Craig White / Environment Superintendent (02) 6542 9525 craig.white@newhopegroup.com.au PO Box 5 Muswellbrook NSW 2333 www.bengalla.com.au/ @	
Industry Details:	Main Activities: Primary ANZSIC:	Black Coal Mining Handling and Preparation	
	Class:	Coal Mining [0600]	
	Group:	Coal Mining [060]	
Cleaner Production Activities	Activity	Comments	
	Installed overflow alarms or automatic shut-off valves	since 1999	
	Implemented inspection or monitoring program for potential spill or leak sources	since 1999	
	Dust suppression - water sprays/chemical suppression	since 1999	
	Dust suppression - wind breaks/covered/enclosed stockpiles	since 1999	
	Community consultative committee	since 1999	
	Other modifications / practices	Pollution Reduction Program - EPA licence requirement since 2011	
Pollution Control Devices	Device	Installed (year)	Comments
	Dust monitor	1999	Current dust monitoring network includes: - 6 x real-time air quality monitors; - 9 x High Volume Air Sampler monitors; and - 29 x depositional dust gauges
Public Statement:			
First published:	March 31, 2020		
Last updated:	March 31, 2020		

Display time: 0.127s

NPI

NPI Home

NPI Database Search

Search Criteria

Source Type = All

Include subthreshold facility data = Yes

Reporting year = 2018/2019

State = National

LGA = MUSWELLBROOK

Substance = All

Destination type = All

Edit Criteria

Drill Down Criteria

Jurisdiction Id = 393

Remove

Key

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GENERAL

This soil landscape covers undulating low hills south-west of Muswellbrook. The main soils are Yellow Solodic Soils (Dy3.43, Dy3.33) on slopes with Alluvial Soils in drainage lines. There are Brown and Yellow Earths (Gn2.41, Gn2.21, Gn2.61) and Prairie Soils (Gn3.91, Gn3.41, Gn4.41) in some drainage lines. Red and Yellow Podzolic Soils (Dr2.11, Dr1.11, Dr2.21, Dy2.11) and Brown Podzolic Soils (Db1.11, Db0.11, Db1.21) occur on slopes. There are also Yellow Solodic Soil – Red-brown Earth intergrades (Dy2.13).

ASSOCIATED SOIL LANDSCAPES: Liddell and Roxburgh

CLIMATIC ZONE: 3B

LANDFORM

Undulating low hills, ranging in elevation from 140 – 220 m. Slopes are 3 – 10%, with slope lengths averaging 1,200 m. Local relief is 40 – 60 m. Drainage lines occur at 700 – 1,000 m intervals.

NATIVE VEGETATION:

Much of the area has been cleared out of woodland for grazing on unimproved pastures. Remnants of forest red gum and forest oak occur. Broad-leaved red ironbark, narrow-leaved red ironbark, bull oak, grey box and swamp oak may also be found in some areas.

GEOLOGY

Geological Unit: Singleton Coal Measures
Parent Rock: Sandstone, shale, mudstone, conglomerate and coal.
Parent Material: *In situ* weathered parent rock with alluvium in the drainage lines.

SOIL EROSION

Moderate sheet and gully erosion is common on slopes. Gullies (to 3 m) are associated with the highly erodible Yellow Solodic Soils. Salt scalds and associated erosion are common in some areas.

GENERAL SOIL DESCRIPTIONS**Yellow Solodic Soils (Dy3.43, Dy3.33)**

Topsoil: Brown fine sandy loam to loam with weak structure; pH 6.0 – 6.5. Overlies bleached dull brown or light grey light sandy clay loam to loam fine sandy; and massive or with weak structure; pH 6.5 – 7.0; depth to 20 cm.
Subsoil: Clear change to bright yellowish brown medium clay with strong structure; yellow, orange or grey mottles (up to 50%); pH 6.5 – 9.0, increasing with depth.

Alluvial Soils

Topsoil: Brown loamy sandy to sandy clay which is single-grained to massive.

Yellow Solodic Soil – Red-brown Earth intergrades (Dy2.13)

Topsoil: Dark reddish brown sandy clay loam that has weak structure; pH 6.5 – 7.0; depth to 18 cm.

Subsoil: Gradual or diffuse change to bright brown sandy clay loam to sandy, light, or light-medium clay; weak structure.

Prairie Soils (Gn3.91, Gn3.41, Gn4.41)

Topsoil: Brown sandy clay loam; massive or with weak structure; depth to 65 cm.

Subsoil: Brownish grey light clay; strong structure; pH 6.0.

Red and Yellow Podzolic Soils (Dr2.11, Dr1.11, Dr2.21, Dy2.11)

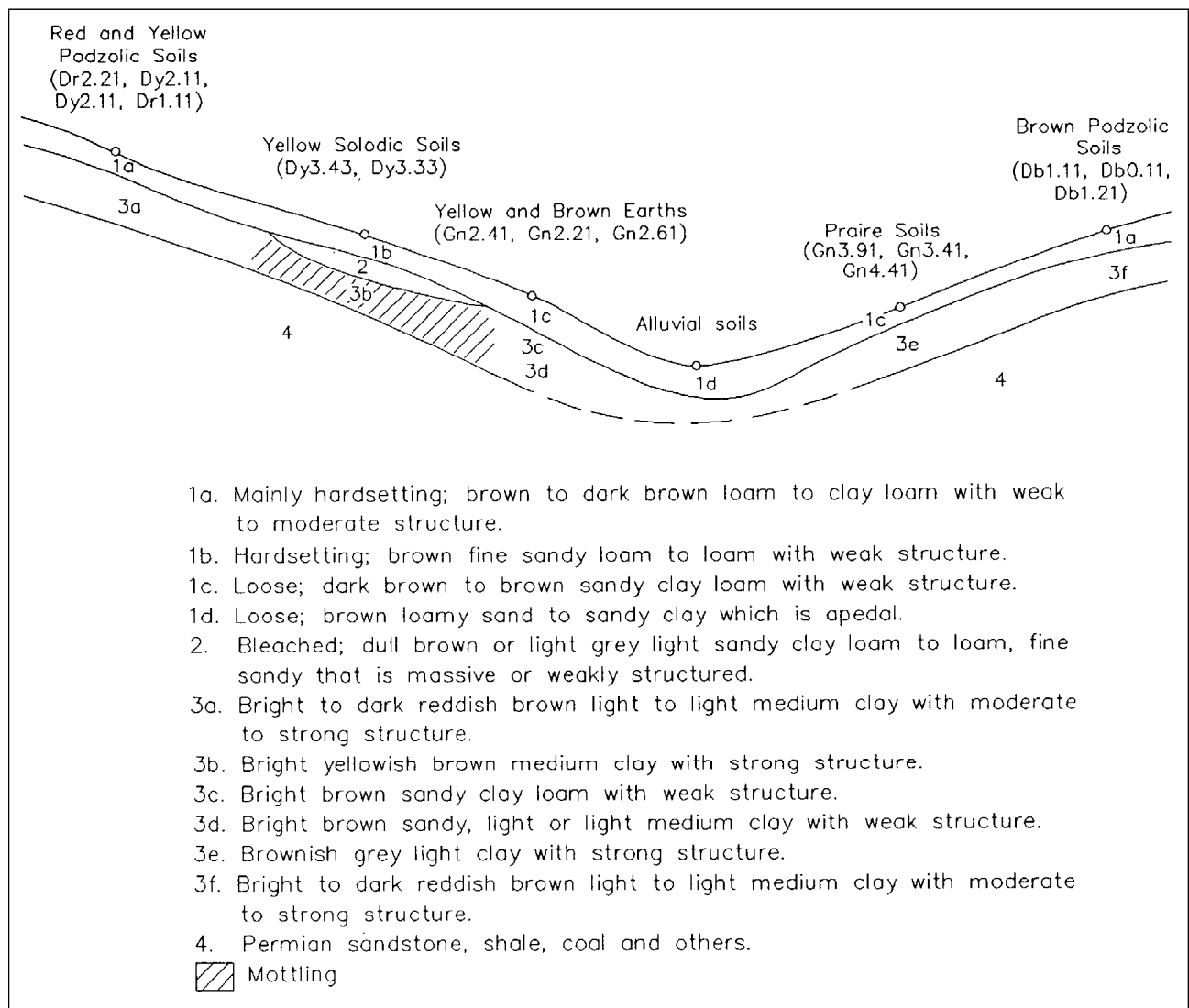
Topsoil: Brown to dark brown loam to clay loam with weak to moderate structure; pH 6.0; depth to 12 cm.

Subsoil: Clear change to bright reddish brown to dark reddish brown light to light medium clay; moderate to strong structure; pH 5.5.

Brown Podzolic Soils (Db1.11, Db0.11, Db1.21)

Topsoil: Brown to dark brown loam to clay loam with weak to moderate structure; pH 5.5; depth to 7 cm.

Subsoil: Clear change to brown light medium clay with moderate to strong structure; pH 5.5.



	Yellow Solodic Soils	Red and Yellow Podzolic Soils
Northcote code	Dy3.43, Dy3.33	Dr2.11, Dr1.11, Dr2.1, Dy2.11
Dominance	Common	Common
Landform element	Lower slope	Slopes
Surface condition	Hardsetting	Hardsetting
Drainage	Poorly to imperfectly drained	Well-drained
Soil permeability	Moderately to slowly permeable	Moderately permeable
Watertable depth	-	-
Available water-holding capacity	Moderate	Moderate to high
Depth to bedrock	+90 cm	40 – 300 cm
Flood hazard	Low to moderate	Low
pH (topsoil)	6.0 – 6.5	6.0
Fertility (chemical)	Low	Low
Known nutrient deficiencies	N, P	N, P, Mo, S
Soil salinity	High	Low
Erodibility (topsoil)	Moderate to high	High
Erodibility (subsoil)	High	Moderate
Erosion hazard	Very high to extreme	Moderate
Structural degradation hazard	High	High
Land capability classification	V	V
USCS (subsoil)	CL	CL, CH
Shrink-swell potential	-	Low
Mass movement hazard	Low	Low

	Brown and Yellow Earths	Prairie Soils
Northcote code	Gn2.41, Gn2.21, Gn2.61	Gn3.91, Gn3.41, Dn4.41
Dominance	Minor	Minor
Landform element	Depositional sites near creeks	Depositional sites near creeks
Surface condition	Loose	-
Drainage	Well-drained	Moderately well-drained to poorly drained
Soil permeability	Highly permeable	Moderately permeable
Watertable depth	-	-
Available water-holding capacity	Low to moderate	Moderate
Depth to bedrock	70 cm	200 cm
Flood hazard	Moderate	Moderate
pH (topsoil)	6.0	6.0
Fertility (chemical)	Low	Low
Known nutrient deficiencies	N, P, Mo, S	N, P
Soil salinity	Low	Low
Erodibility (topsoil)	High	Low to high
Erodibility (subsoil)	Moderate to high	Moderate to high
Erosion hazard	Moderate	Moderate
Structural degradation hazard	High	Low to high
Land capability classification	IV	IV
USCS (subsoil)	CL	-
Shrink-swell potential	Low	-
Mass movement hazard	Low	Low

	Alluvial Soils	Yellow Solodic Soils – Red-brown Earth intergrades
Northcote code	-	Dy2.13
Dominance	Minor	Minor
Landform element	Lower slopes and drainage depressions	Upper slope
Surface condition	Loose	Hardsetting
Drainage	Moderately well-drained	Well-drained
Soil permeability	Moderately permeable	Moderately permeable
Watertable depth	70 cm	-
Available water-holding capacity	Moderate	Moderate
Depth to bedrock	+80 cm	+50 cm
Flood hazard	High	Low
pH (topsoil)	6.0	6.5
Fertility (chemical)	Low	Low
Known nutrient deficiencies	N,P	N,P
Soil salinity	High	High
Erodibility (topsoil)	Moderate	Moderate
Erodibility (subsoil)	Low	Moderate
Erosion hazard	Very high	Very high
Structural degradation hazard	Moderate	High
Land capability classification	IV, V	V
USCS (subsoil)	-	-
Shrink-swell potential	Low	-
Mass movement hazard	Low	Low

Brown Podzolic Soils	
Northcote code	Db1.11, Db0.11, Db1.21
Dominance	Minor
Landform element	Slopes
Surface condition	Crusting or hardsetting
Drainage	Moderately well-drained
Soil permeability	Moderately permeable
Watertable depth	-
Available water-holding capacity	Low to moderate
Depth to bedrock	40 – 250 cm
Flood hazard	Low
pH (topsoil)	5.5
Fertility (chemical)	Low
Known nutrient deficiencies	N, P, Mo, S
Soil salinity	Low
Erodibility (topsoil)	High
Erodibility (subsoil)	Moderate
Erosion hazard	Moderate
Structural degradation hazard	Moderate
Land capability classification	V
USCS (subsoil)	CH, CL
Shrink-swell potential	Low
Mass movement hazard	Low

GENERAL

This soil landscape covers smooth undulating rises and low hills, becoming at higher elevations the Brays Hill soil landscape. The main soils are Brown Clays (Ug5.32) with some Black Earths (Uf6.22, Ug5.14) on upper to midslopes, Euchrozems (Gn4.23) and Non-calcic Brown Soils (Dr4.12, Dr2.12) on mid to lower slopes, and Prairie Soils (Gn3.42) on the alluvial flats. In other areas there are Red-brown Earths (Dr2.13) on the upper slopes, Chocolate Soil - Red-brown Earth intergrades (Gn4.13) on midslopes and Chocolate Soils (Gn3.23) on the lower slopes.

ASSOCIATED SOIL LANDSCAPES: Brays Hill and Hunter

CLIMATIC ZONE: 3B

LANDFORM

Undulating rises and low hills with elevation ranges of 100 – 140 m and 200 – 260 m. Slopes are gently (0 – 10%) and long and smooth (100 – 2,500 m). Local relief is 30 – 80 m. Drainage lines occur at intervals of 400 – 600 m, with some to 1,000 m. Some of this landscape is made up of old gravel terrace remnants by the Hunter River.

NATIVE VEGETATION

Woodland of white box, grey box, yellow box and Blakelys red gum, extensively cleared for grazing.

GEOLOGY

Geological Unit: Singleton Coal Measures and Quaternary alluvium.
Parent Rock: Calcareous shale and sandstone, some alluvial sediments.
Parent Material: *In situ* weathered parent rock, colluvium and alluvium.

SOIL EROSION

Minor to moderate sheet erosion on some hillslopes.

GENERAL SOIL DESCRIPTIONS:**Brown Clays (Ug5.32)**

Topsoil: Dark reddish brown or dark brown light clay with strong structure; pH 7.0 – 8.5. May become brownish black with depth; depth to 45 cm.
Subsoil: Gradual change to dark brown light medium clay with strong structure; smooth-faced dense peds; pH 8.0 – 8.5.

Black Earths (Uf6.22, Ug5.14)

Topsoil: Dark brown to brownish black light medium clay with strong structure; pH 6.5 – 7.0; depth to 15 cm.
Subsoil: Clear change to brownish black light medium clay with strong structure; carbonate nodules may be present; pH 7.0. Becomes more brown with depth; medium clay; dense peds; pH 7.5 – 9.0.

Euchrozems (Gn4.23)

- Topsoil: Dark reddish brown fine sandy clay loam with moderate structure; pH 9.0 dropping to 6.0.
- Subsoil: Clear change to dark reddish brown light clay with strong structure; rough-faced porous peds; pH 8.0.

Non-calcic Brown Soils (Dr4.12, Dr2.12)

- Topsoil: Dark reddish brown clay loam to silty clay loam with weak to moderate structure; pH 6.5; depth to 10 cm.
- Subsoil: Clear change to darker reddish brown clay loam overlying light medium to medium clay; strong structure; rough- or smooth-faced dense peds; pH 6.5 – 7.0.

Prairie Soils (Gn3.42)

- Topsoil: Brownish black silty clay loam with strong structure; pH 6.5; depth to 15 cm.
- Subsoil: Gradual change to brownish black light clay over sandy clay with strong structure; porous smooth- and rough-faced peds; pH 6.5 – 7.5.

Red-brown Earths (Dr2.13)

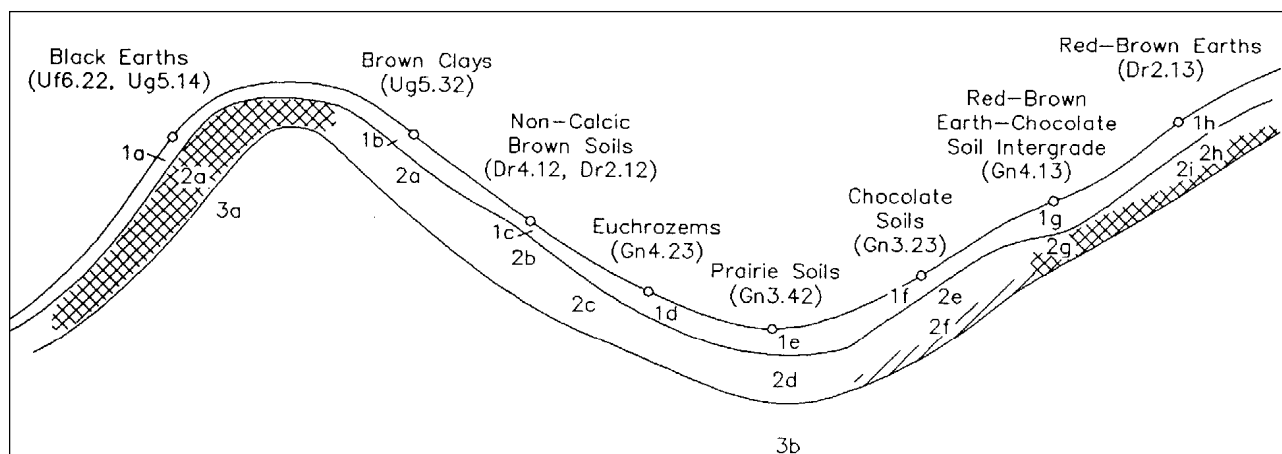
- Topsoil: Dark brown clayey sand; single-grained; pH 6.0 - 6.5; depth to 40 cm.
- Subsoil: Clear change to reddish brown light medium clay with moderate structure; pH 8.0. With depth becomes a darker medium clay with carbonate nodules; pH 9.0.

Chocolate Soils (Gn3.23)

- Topsoil: Very dark reddish brown silty clay loam with moderate structure; pH 6.5; depth to 20 cm.
- Subsoil: Gradual change to dark brown silty clay with strong structure; pH 7.0. Becomes a brown heavy clay with strong structure; dense smooth-faced peds; pH 8.5 – 9.0.

Chocolate Soil - Red-brown Earth intergrades (Gn4.13)

- Topsoil: Dark brown fine sandy clay loam with weak structure; pH 6.5; depth to 5 cm.
- Subsoil: Gradual change to dark brown light medium clay with strong structure; pH 7.0. With depth becomes a brown medium clay with strong structure; diffuse carbonate present; pH 9.0.



	Brown Clays	Black Earths
Northcote code	Ug5.32	Uf6.22, Ug5.14
Dominance	Common	Minor
Landform element	Upper to midslope	Upper slope
Surface condition	Self - mulching and loose	Friable
Drainage	Moderately well-drained	Moderately well-drained
Soil permeability	Slowly to moderately permeable	Slowly permeable
Watertable depth	+100 cm	-
Available water-holding capacity	High	High
Depth to bedrock	+75 cm	100 cm
Flood hazard	Low	Low
pH (topsoil)	7.0 – 8.5	6.5 – 7.0
Fertility (chemical)	Moderate	High
Known nutrient deficiencies	P	-
Soil salinity	Low	Low
Erodibility (topsoil)	Low to moderate	Low
Erodibility (subsoil)	Moderate	Low
Erosion hazard	Moderate	Moderate
Structural degradation hazard	Low	Low
Land capability classification	II, III	III
USCS (subsoil)	-	-
Shrink-swell potential	High	High
Mass movement hazard	Low	low

	Euchrozems	Non-calcic Brown Soils
Northcote code	Gn4.23	Dr4.12, Dr2.12
Dominance	Minor	Minor
Landform element	Lower slope	mid to lower slope
Surface condition	Friable	Loose or hardsetting
Drainage	Well-drained	Well-drained
Soil permeability	Moderately permeable	Moderately permeable
Watertable depth	-	-
Available water-holding capacity	Moderate to high	Moderate
Depth to bedrock	+70 cm	+60 cm
Flood hazard	Low	Low
pH (topsoil)	9.0	6.5
Fertility (chemical)	Moderate	Moderate
Known nutrient deficiencies	P	P
Soil salinity	Low	Low
Erodibility (topsoil)	Low	Low to moderate
Erodibility (subsoil)	Moderate	Low
Erosion hazard	Moderate	Moderate to high
Structural degradation hazard	Moderate	Moderate to high
Land capability classification	IV, V	V
USCS (subsoil)	-	-
Shrink-swell potential	-	-
Mass movement hazard	Low	Low

	Prairie Soils	Red-brown Earths
Northcote code	Gn3.42	Dr2.13
Dominance	Minor	Minor
Landform element	Alluvial flat	Upper slope
Surface condition	Hardsetting	Hardsetting
Drainage	Well-drained	Moderately well-drained
Soil permeability	Moderately permeable	Moderately permeable
Watertable depth	+100 cm	-
Available water-holding capacity	Moderate to high	Moderate
Depth to bedrock	+50 cm	+100 cm
Flood hazard	Moderate	Low
pH (topsoil)	6.5	6.0
Fertility (chemical)	Moderate	Moderate
Known nutrient deficiencies	P	P
Soil salinity	Low	Low
Erodibility (topsoil)	Low	Low
Erodibility (subsoil)	Low	Low
Erosion hazard	Moderate	Slight
Structural degradation hazard	High	High
Land capability classification	III	III
USCS (subsoil)	-	-
Shrink-swell potential	-	-
Mass movement hazard	Low	Low

	Chocolate Soils	Chocolate Soil – Red-brown Earth intergrades
Northcote code	Gn3.23	Gn4.13
Dominance	Minor	Minor
Landform element	Midslope	mid to lower slope
Surface condition	Self - mulching	Hardsetting
Drainage	Imperfectly drained	Moderately well-drained
Soil permeability	Moderately permeable	Moderately permeable
Watertable depth	-	-
Available water-holding capacity	Moderate to high	Moderate
Depth to bedrock	+100 cm	+60 cm
Flood hazard	Low	Low
pH (topsoil)	6.5	6.5
Fertility (chemical)	Moderate	Moderate
Known nutrient deficiencies	P	P
Soil salinity	Low	Low
Erodibility (topsoil)	Moderate	Moderate
Erodibility (subsoil)	Low	Low
Erosion hazard	High	High
Structural degradation hazard	Moderate	High
Land capability classification	IV	IV
USCS (subsoil)	-	-
Shrink-swell potential	-	-
Mass movement hazard	Low	Low

GENERAL

This soil landscape covers the floodplains of the Hunter River and its tributaries. The main soils are all formed in alluvium. They include Brown Clays and Black Earths (Ug5.34, Ug5.17) on prior stream channels and on tributary flats, with Chernozems (Uf5.1) on prior stream channels adjacent to Dartbrook and Brays Hill soil landscapes and in many of the valleys such as Martindale and Widden. Alluvial Soils (loams – Um5 and sands – Um5.52, Um6.1, Uc) occur on levees and flats adjacent to the present river channel. Red Podzolic Soils and Lateritic Podzolic Soils (Dr2.11, Db2.41) are located on old terraces, with Non-calcic Brown Soils (Db1.13) and Yellow Solodic Soils in some drainage lines.

ASSOCIATED SOIL LANDSCAPES: Dartbrook and Brays Hill.

CLIMATIC ZONE: 3E

LANDFORM

Level plains and river terraces of the Hunter River with elevations of 20 - 60 m. Slopes are 0 – 3%. The width of the plains ranges from 200 – 3,200 m. Local relief is generally less than 10 m.

NATIVE VEGETATION

No native vegetation now remains due to clearing for intensive agriculture including vegetable and lucerne production, dairying and other grazing on improved pasture.

GEOLOGY

Geological Unit: Quaternary alluvium.

Parent Rock: —

Parent Material: Alluvium.

SOIL EROSION

Minor stream bank erosion occurs on present watercourses with minor sheet and gully erosion on adjacent terraces. Aggrading landscape.

GENERAL SOIL DESCRIPTIONS:**Non-calcic Brown Soils (Db1.13)**

Topsoil: Brownish black clay loam with moderate structure; pH 6.5; depth to 30 cm.

Subsoil: Gradual change to dark brown medium clay with strong structure; rough-faced peds; pH 7.0.
Increasing alkalinity with depth to pH 9.0.

Brown (Cracking) Clays (Ug5.34, Ug5.32, Uf6.12)

Topsoil: Brownish black to brown light medium clay with strong structure; very strong consistence (soil strength) on surface; pH 7.0 – 7.5.
With depth becomes dark brown; depth to 30 cm.

Subsoil: Gradual change to dark brown to dull brown medium clay with strong structure; rough - and smooth-faced peds; orange, grey and red mottles (to 40%) in poorly drained areas; pH 7.0 – 9.0.

(Layered) Alluvial Soils

Topsoil: Brownish black medium clay with strong structure; pH 6.5; depth to 10 cm.
Gradual change to dark brown silty clay; pH 7.0; depth to 40 cm.
Gradual change to brownish black sandy clay loam; massive; earthy fabric; pH 7.5.
Grades into a brown sandy loam; massive; sandy fabric; pH 8.0.
Other texture combinations occur in this group of soils.

Brown Clay – Black Earth intergrades (Ug5.3, Ug1)

Topsoil: Seasonally cracking brown light clay with strong angular blocky structure; pH 7.0.
Subsoil: Gradual change to brown light medium clay with strong structure; pH 7.0.
Becomes a brownish black heavy clay with strong angular blocky structure; dense smooth-faced peds; pH 8.5.

Black Earths (Ug5.17)

Topsoil: Very dark brown silty clay with strong angular blocky structure; pH 7.0; depth to 15 cm.
Subsoil: Gradual change to brownish black to black light to light medium clay with strong angular blocky structure; smooth-faced peds; pH 7.5 – 8.0.

Alluvial Soils (sands) (Uc, Uc1.43)

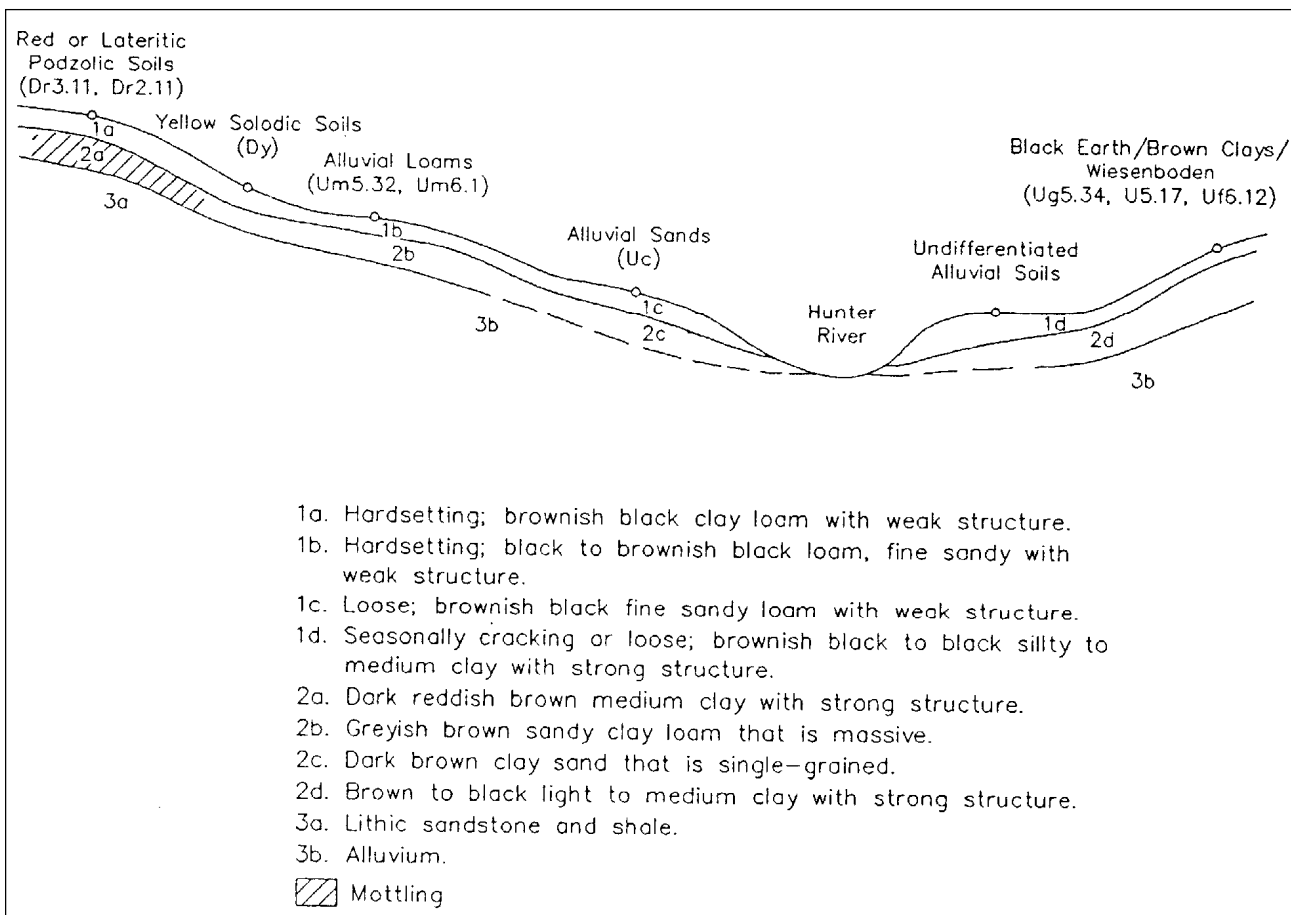
Topsoil: Brownish black fine sandy loam; weakly structured at the surface over a massive layer; pH 6.5 – 7.5.
Grades into a dark brown clayey sand with depth; single-grained or massive; sometimes with iron nodules; pH 8.0.

Alluvial Soils (loams) (Um)

Topsoil: Black to brownish black loam fine sandy; weakly structured; pH 5.5; depth to 50 cm.
Subsoil: Gradual change to greyish brown sandy clay loam; massive; up to 40% rounded stones.

Red Podzolic Soils (Dr3.11)

Topsoil: Brownish black clay loam with weak structure; pH 6.0; depth to 25 cm
Subsoil: Sharp change to dark reddish brown medium clay with strong angular blocky structure; brown mottles (20%); smooth-faced peds; pH 5.5;
With depth becomes orange with grey mottles (40%).



	Brown (Cracking) Clays	Black Earths
Northcote code	Ug5.34, Ug5.32, Uf6.12	Ug5.17
Dominance	Common	Common
Landform element	First terrace	Prior stream channels
Surface condition	Seasonally cracking or loose; crusting under cultivation	Seasonally cracking
Drainage	Imperfectly drained	Moderately well-drained
Soil permeability	Moderately permeable	Moderately permeable
Watertable depth	+100 cm	+100 cm
Available water-holding capacity	High	High
Depth to bedrock	+40 cm	+100 cm
Flood hazard	Moderate	Moderate
pH (topsoil)	7.5	7.0
Fertility (chemical)	Moderate to high	Moderate
Known nutrient deficiencies	P	-
Soil salinity	Low to moderate	Low
Erodibility (topsoil)	Low	Moderate
Erodibility (subsoil)	Low	Moderate
Erosion hazard	Moderate	High
Structural degradation hazard	High	High
Land capability classification	I, II	II
USCS (subsoil)	-	-
Shrink-swell potential	High	High
Mass movement hazard	Nil	nil

	Non-calci Brown Soils	(Layered) Alluvial soils
Northcote code	Db1.13	-
Dominance	Minor	Minor
Landform element	Second terrace	Minor tributaries
Surface condition	Loose	Seasonally cracking
Drainage	Moderately well-drained	Moderately well-drained
Soil permeability	Moderately permeable	Moderately permeable
Watertable depth	+100 cm	+100 cm
Available water-holding capacity	High	Moderate
Depth to bedrock	+70 cm	+100 cm
Flood hazard	Nil	Moderate
pH (topsoil)	6.5	6.5
Fertility (chemical)	Moderate	Moderate
Known nutrient deficiencies	P	-
Soil salinity	Low	Low
Erodibility (topsoil)	Moderate	Low
Erodibility (subsoil)	Low	-
Erosion hazard	High	High
Structural degradation hazard	High	High
Land capability classification	III	II
USCS (subsoil)	-	-
Shrink-swell potential	-	-
Mass movement hazard	Nil	Nil

	Alluvial Soils (sands)	Alluvial soils (loams)
Northcote code	Uc, Uc1.43	Um
Dominance	Minor	Minor
Landform element	Midslope of first terrace	First terrace
Surface condition	Loose	Hardsetting
Drainage	Rapidly drained	Well-drained
Soil permeability	Highly permeable	Highly permeable
Watertable depth	+200 cm	150 cm
Available water-holding capacity	Low	Low to moderate
Depth to bedrock	+300 cm	+60 cm
Flood hazard	High	Moderate
pH (topsoil)	6.5	5.5
Fertility (chemical)	Low	Low
Known nutrient deficiencies	N,P	N,P
Soil salinity	Low	Low
Erodibility (topsoil)	Moderate	Moderate
Erodibility (subsoil)	-	Moderate
Erosion hazard	Slight to moderate	Moderate
Structural degradation hazard	High	Moderate
Land capability classification	II	II
USCS (subsoil)	-	-
Shrink-swell potential	Low	Low
Mass movement hazard	Low	Low

Red Podzolic Soils	
Northcote code	Dr3.11
Dominance	Minor
Landform element	Old terrace
Surface condition	Hardsetting
Drainage	Imperfectly drained
Soil permeability	Moderately permeable
Watertable depth	-
Available water-holding capacity	Moderate
Depth to bedrock	+100 cm
Flood hazard	Low
pH (topsoil)	6.0
Fertility (chemical)	-
Known nutrient deficiencies	-
Soil salinity	Low
Erodibility (topsoil)	Low
Erodibility (subsoil)	Low
Erosion hazard	Slight
Structural degradation hazard	Moderate
Land capability classification	II, III
USCS (subsoil)	-
Shrink-swell potential	-
Mass movement hazard	Nil

GENERAL

This soil landscape covers undulating low hills and undulating hills in the Liddell Power Station area. The main soils are Yellow Soloths (Dy2.41, Dy3.81) on slopes with some Yellow Solodic Soils (Dy3.32, Dy2.42, Dy3.42) on concave slopes. There are Earthy and Siliceous Sands (Uc5.22, Uc5.11) on mid to lower slopes where the parent material is more sandy. There are some Red Soloths (Dr2.41), Red Solodic Soils (Dr2.41) and Red Podzolic Soils (Dr5.11).

ASSOCIATED SOIL LANDSCAPE: Bayswater

CLIMATIC ZONE: 3B

LANDFORM

Undulating low hills with a few undulating hills, ranging in elevation from 140 – 220 m. Slopes are 4 – 7%, with long slope lengths (1,200 – 2,000 m). Local relief is 60 – 120 m. Drainage lines occur at 300 – 1,000 m intervals.

NATIVE VEGETATION

An open-woodland of narrow-leaved red ironbark, yellow box, white box and spotted gum with some Blakelys red gum, rough-barked apple and kurrajong. Bull oak and swamp oak are also common. There is some smooth-barked apple.

GEOLOGY

Geological Unit: Singleton Coal Measures

Parent Rock: Lithic sandstone, shale, mudstone, conglomerate, siltstone and coal seams.

Parent Material: *In situ* weathered parent rock and some derived colluvium.

SOIL EROSION

Minor to severe sheet erosion is common, with some minor rill erosion. Moderate gully erosion (to 1.5 m) in drainage line where salting may be a feature.

GENERAL SOIL DESCRIPTIONS:**Yellow Soloths (Dy2.41, Dy3.81)**

Topsoil: Brown loamy sand to sandy loam; single-grained at the surface and massive below; pH 6.0.

Overlies A₂ horizon or pan. Bleached; light grey or dull yellow orange sandy loam or sandy clay loam; massive; pH 6.0 – 6.5; depth to 25 cm.

Subsoil: Sharp or clear change to bright brown or dull orange sandy clay with weak or strong structure; distinct brown or orange mottles (to 20%); pH 6.0 – 6.5.

Yellow Solodic Soils (Dy3.32)

Topsoil: Dark brown loam; weak structure; pH 6.5.

Overlies A₂ horizon. Bleached; dull orange clay loam with weak structure; pH 6.0; depth to 20 cm.

Subsoil: Clear change to bright reddish brown light clay; strong angular blocky structure; pH 6.5.
Becomes more yellowish brown with depth; orange and grey mottles (to 30%).

Earthy Sands (Uc5.22)

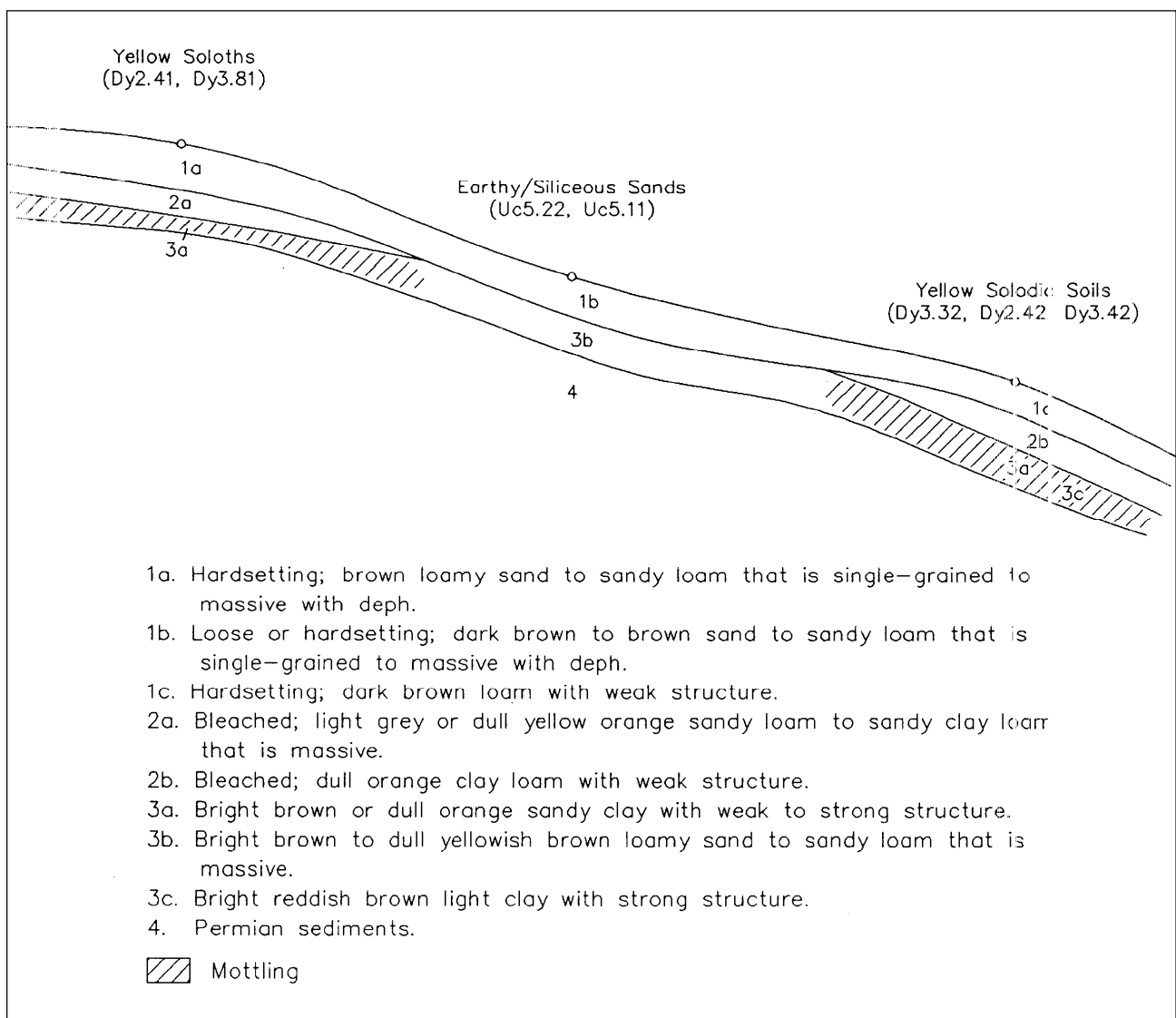
Topsoil: Dark brown sandy loam; single-grained at surface; massive below; pH 6.0 – 6.5; depth to 40 cm.

Subsoil: Gradual change to dull yellowish brown sandy loam; massive; earthy fabric; pH 7.0.

Siliceous Sands (Uc5.1)

Topsoil: Brown sand to loamy sand; single-grained; massive below surface; pH 6.0; depth to 40 cm.

Subsoil: Gradual change to bright brown loamy sand; massive; sandy fabric.



	Yellow Soloths	Yellow Solodic Soils
Northcote code	Dy2.41, Dy3.81	Dy3.32
Dominance	common	minor
Landform element	upper to lower slopes	midslope
Surface condition	hardsetting	hardsetting
Drainage	poorly to well drained	imperfectly drained
Soil permeability	moderately permeable	moderately permeable
Watertable depth	variable	variable
Available water-holding capacity	Moderate	Moderate
Depth to bedrock	+50 cm	+110 cm
Flood hazard	Low to moderate	Low
pH (topsoil)	6.0	6.5
Fertility (chemical)	Low	Low
Known nutrient deficiencies	-	-
Soil salinity	High	High
Erodibility (topsoil)	Moderate to high	Moderate
Erodibility (subsoil)	Moderate to high	Moderate
Erosion hazard	High to very high	High
Structural degradation hazard	High	High
Land capability classification	V, VI	V
USCS (subsoil)	-	-
Shrink-swell potential	-	-
Mass movement hazard	Low	Low

	Earthy Sands	Siliceous Sands
Northcote code	Uc5.22	Uc5.11
Dominance	Minor	Minor
Landform element	Midslope	Lower slope
Surface condition	Hardsetting and gravelly	Loose
Drainage	Well drained	Well drained
Soil permeability	Highly permeable	Highly permeable
Watertable depth	-	-
Available water-holding capacity	Low	Low
Depth to bedrock	+55 cm	+100 cm
Flood hazard	Low	Moderate
pH (topsoil)	6.0	6.0
Fertility (chemical)	Low	Low
Known nutrient deficiencies	-	-
Soil salinity	Low	Low
Erodibility (topsoil)	Low	Low
Erodibility (subsoil)	Low	Low
Erosion hazard	High	High
Structural degradation hazard	Moderate	Moderate
Land capability classification	V	V
USCS (subsoil)	-	-
Shrink-swell potential	Low	Low
Mass movement hazard	Low	Low

Appendix B Community and Stakeholder Engagement Strategy



NGH



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Community and Stakeholder Engagement Strategy

Hunter River Solar Farm

May 2021

Project Number: 20-838



Document verification

Project Title:	Hunter River Solar Farm
Project Number:	20-838
Project File Name:	20210510 HUN Community & Stakeholder Engagement Strategy - reviewed by client - final v1

Revision	Date	Prepared by	Reviewed by	Approved by
Draft 1.0	6/05/2021	Ainslee Roser	Zeina Jokadar	
Final 1.0	19/05/2021	Ainslee Roser	Zeina Jokadar	Zeina Jokadar

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Acronyms and abbreviations

AC	Alternating current
CIV	Capital Investment Value
CSES	Community and Stakeholder Engagement Strategy
DC	Direct Current
DPIE	Department of Planning, Industry and Environment (NSW)
EIS	Environmental impact statement
ha	hectares
HRSF	Hunter River Solar Farm
IAP2	International Association for Public Participation
km	kilometres
kV	kilovolt
LALC	Local Aboriginal Land Council
LEP	Local Environment Plan
LGA	Local Government Area
m	metres
MW	megawatt
MWh	megawatt per hour
PV	Photovoltaic
SEARs	Secretary's Environmental Assessment Requirements
SEIFA	Socio-Economic Indexes for Areas
TfNSW	Transport for NSW

1. Introduction

1.1 Community Consultation Principles

Best practice community consultation involves the community in all decision-making stages of a Proposal. The community plays a role from Proposal conception, through the assessment process and on to Proposal development. Effective community consultation has three important functions:

1. Facilitate deeper understanding of potential issues and decisions required for the Proposal.
2. Enhance the quality of decisions made for the Proposal.
3. Allow people to contribute to decisions that affect their lives.

Effective community consultation includes three important community engagement principles:

- Openness – combats assumptions and misinformation.
- Inclusiveness - consultation should be diverse and representative, not responding only to the most vocal stakeholders.
- Effective communication – requires tools appropriate to the task to build trust between parties.
- A communication plan – clearly setting out what the Proposal is about to:
 - Inform: one-way communication to deliver information about the Proposal.
 - Consult: two-way communication to seek input into the Proposal.
 - Collaborate and involve: seek participation in elements of the Proposal design and implementation.
- Early rather than late communication - to maximise engagement opportunities.
- Accountability – monitoring and evaluation to ensure consultation aims are being achieved.

1.2 Aim of this Plan

This Community and Stakeholder Engagement Strategy (CSES) has been developed for the Hunter River Solar Farm (HRSF), the 'Proposal'.

The aim of the strategy is to:

1. Identify effective methods to inform the community about the HRSF Proposal.
2. Facilitate engagement with the community. This includes allowing meaningful contributions from the community into the environmental assessment and Proposal development.
3. Obtain social license to operate from the local community. This will allow for good long-term relationships with community stakeholders.
4. Meet the requirements of the *Large-Scale Solar Energy Guideline*, NSW Department of Industry, Planning and Environment.

The strategy identifies:

- Community stakeholders for the Proposal.
- Issues/risks related to the engagement of each stakeholder group.
- A consultation plan for each stakeholder group.
- A set of consultation activities against the Proposal's development timeline.

Effective engagement requires an understanding of community stakeholders and prioritisation of potential impacts. It also relies on an understanding within the community of the Proposal and specific issues of interest to them, for the community to contribute effectively. The focus of the consultation strategy will be on providing this understanding and engagement.

1.3 Structure

The structure of this strategy includes:

1. Proposal overview.
2. Identification of community stakeholders for the Proposal.
3. Consultation objectives.
4. Issue management – specific issues/risks of each stakeholder that require consideration.
5. Proposal based activities –activities that will be undertaken to achieve the goals of this CSES and a timeline to facilitate consultation.

1.4 Implementation and Revision of this Document

This CSES has been developed to coincide with the scoping report stage of the HRSF Proposal.

If the Proposal is approved, consultation will also be required to continue into the assessment, construction and operational phases of the Proposal. These phases will require a new or updated CSES in order to reflect any changes to consultation objectives but also, the increasing knowledge gained about the community. At this stage, only pre-approval Proposal stages are addressed. However, should there be queries on Proposal stages that have not been finalised or identified, the CSES would respond to these queries to prevent the side-tracking of community expectation.

1.5 Relevant Guidelines

This CSES has been prepared considering the following guidelines and references:

- *Community and Stakeholder Engagement Guideline 2017*, NSW Department of Industry, Planning and Environment.
- *Community Guide to EIA 2017*. NSW Department of Industry, Planning and Environment.
- *Community Consultative Committee Guideline 2019*, NSW Department of Industry, Planning and Environment.
- *Large-Scale Solar Energy Guideline for State Significant Development 2018*, NSW Department of Industry, Planning and Environment.
- *Aboriginal cultural heritage consultation requirements for proponents 2010*, NSW Government.
- *Beyond Public Meetings: Connecting community engagement with decision making*, Twyford Consulting 2007.

1.6 Terminology

- **Proposal:** the construction and operation of the Hunter River Solar Farm (HRSF) and associated ancillary infrastructure. The HRSF would have a total generation capacity of capacity of 84 MWp DC/ 60 MW AC.
- **Study Area:** The Proposal which includes all or portions of the Lot/DPs for the solar farm, access roads, and transmission line (before any subdivisions / leases / purchases)
- **Study Locality:** 10km search area around the Development Footprint.
- **Proponent:** BayWa r.e. Projects Australia Pty Ltd.

2. Proposal Overview

2.1 Study Area

The Proposal is located 7 kilometres north-east of Denman, NSW across Lot 11 DP215827 and Lot 12 DP215827 and approximately 12 km south-west of Muswellbrook. within the Muswellbrook Local Government Area (LGA). The Study Locality around the Study Area is shown in Figure 2-1. The Proposal is accessible from Denman Road. The Study Area covers 110 hectares (ha) across two lots as shown in Figure 2-2, and is zoned RU1 (Primary Production) under the Muswellbrook Local Environmental Plan (LEP).

The Study Area is predominantly used for cattle grazing, and retains one house and sheds. As such the majority of the Study Area is a modified landscape with remnant scattered trees. There are five dams located within the Study Area.

An existing power line runs approximately 30 metres east of the existing access road from Denman road to the house, supplying electricity. Two 66 kV Ausgrid powerlines pass parallel to Denman road, one of which passes through the Study Area. These powerlines connect Denman Zone Substation with the Mitchell Line Sub-Transmission Substation. A 500 kV TransGrid powerline passes through the north-west corner of the Study Area, connecting Bayswater with Wollar and Bannaby.

The surrounding properties' main land use is agricultural production also zoned as RU1 – Primary Production. There are a total of seven residential dwellings within 1 km of the Study Area. The Hunter River is approximately 700 metres north-west of the Study Area.

The nearest railway station by distance is the Roxburgh station two kilometres north-east, and Denman station is located approximately eight kilometres west along the Merriwa Branch Railway line.

Newcastle Airport is the closest international airport to the Study Area, and is Australia's sixth largest regional airport, located 107 kilometres from Muswellbrook. Scone regional airport located 33 kilometres north of Muswellbrook acts as a base of operation for seven commercial aviation operators, a local aero club and several owners and operators of light aircraft. There is an airstrip located at 2320 Golden Highway, Denman (Destiny Airstrip).

Mangoola Open Cut mine is the only mine located within approximately five kilometres of the Study Area. Bengalla Open cut mine and Mount Arthur open cut mine are within 10 kilometres of the Study Area.

Hunter Valley Camels, a producer of camel milk is located opposite the study area at 1618 Denman Road, Denman. Pukara Estate, a commercial olive grove is located approximately 1.3 kilometres north-east of the study area.

2.2 Proposal Description

The Proposal would involve the construction, operation and eventual decommissioning or reconditioning (subject to future approvals) of a photovoltaic (PV) solar facility and associated infrastructure with a capacity of up to 84 MW_p DC / 60 MWAC, including an energy storage system of up to 60 MW(AC) and 180 MWh. It would supply electricity to the national electricity grid. The indicative Study Area is 110 ha with the area of solar array and associated infrastructure anticipated to occupy 110 ha (termed the Development Footprint). Solar farms typically have a Ground Cover Ratio (GCR) of between 30-50%. While the current Development Footprint indicated

is 110 ha, it would be refined during the EIS process. This would include one on-site substation, associated infrastructure and site facilities such as an operations and storage buildings.

An energy storage system is also proposed in a secure compound next to the substation. The substation location, storage technology, rated capacity (MW) and storage (MWh) would be determined during detailed design. At this stage it is envisaged that the system would utilise lithium-ion batteries up to 60 MW(AC) and 180 MWh.

The Proposal is likely to include the following infrastructure:

- Up to 18 inverters (typical inverter size being 4200 kVA to 4400 kVA) and up to 18 inverter power stations.
- Up to 2500 single axis trackers (typical trackers accommodate approximately 50 to 100 PV modules)
- Up to 160,000 PV modules.
- Up to 60 MW(AC) and 180 MWh energy storage system
- Substation, associated infrastructure, operations and storage buildings.
- Internal access track 4 metres wide, with occasional 6-metre-wide passing bays
- As the Proposal's substation will be on the same parcel as the solar arrays, there is no need for an additional powerline within the existing road easement to connect to an offsite substation.

Detailed site investigations during assessment, planning and design stages would inform an indicative layout of the Proposal, as well as indicative access tracks and access points.

The construction phase is expected to take approximately 18 months, with peak construction taking around 9 months. It is anticipated that the HRSF would operate for 50 years. Subsequently, the Proposal may be decommissioned if the power output is no longer required or it may be deemed advantageous to undertake reconditioning of the Proposal. If the decision to recondition the HRSF was made, this would be subject to relevant government approvals and consents before the reconditioning was undertaken at the end of the initial HRSF's life.

When the site is to be decommissioned, it would involve removal of all above ground infrastructure except the substation and return of the site to its existing land capability. The substation and underground cables may also be removed at the proponent's discretion. The use of piles to support the solar arrays makes de-commissioning and land rehabilitation simple and complete.

The capital investment value (CIV) of the HRSF is approximately \$92 million. A detailed CIV report would be prepared as part of the development application process.

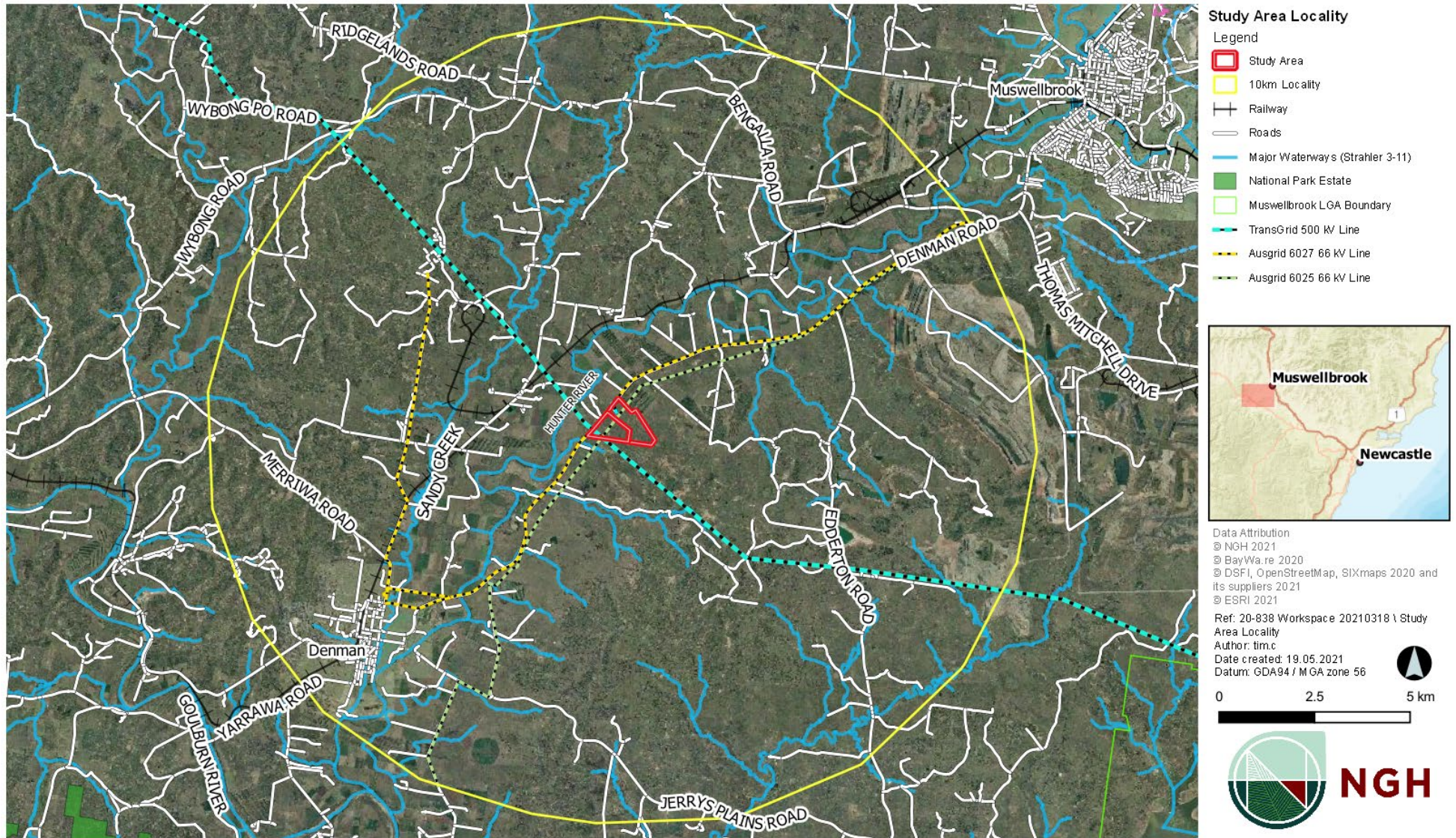


Figure 2-1 Locality of the Proposal

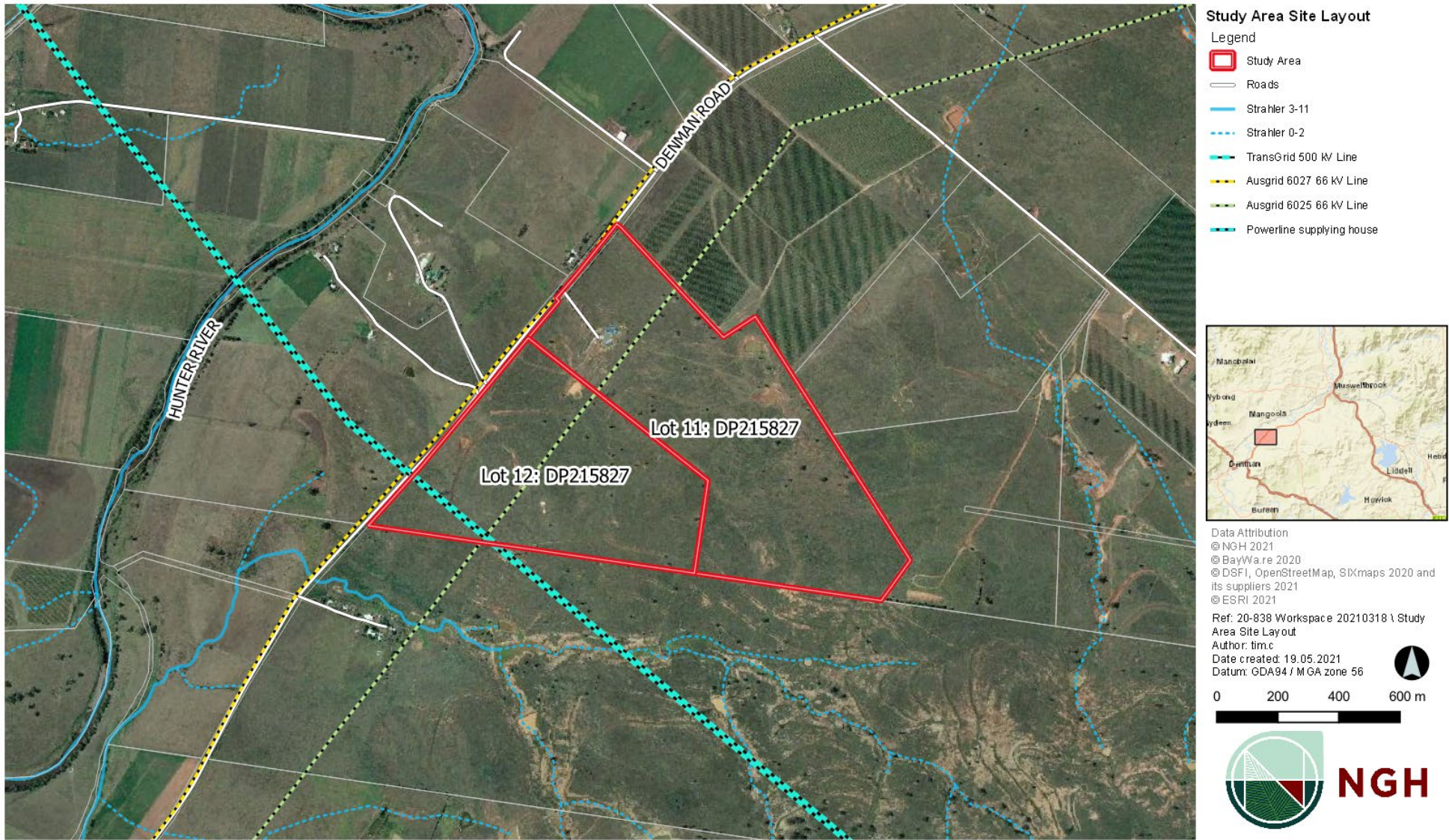


Figure 2-2 Study Area

3. Community Profile

Understanding the makeup and values of a community is essential to finding effective ways to reach the community. It is also important to understand ways the Proposal may impact the community. This may not be limited to the construction and operational stages of the Proposal but may also include the pre-lodgment assessment phase, as the Proposal is being shaped. This section provides a broad overview of the community demographics in the Muswellbrook Shire Local Government Area (LGA) and the local townships of Denman and Muswellbrook.

3.1 Muswellbrook Shire Local Government Area

3.1.1 LGA overview

The Proposal is located within the Muswellbrook Shire LGA, which covers 3,402km², and is centrally located in the Upper Hunter Valley approximately 130km north-west of Newcastle. Lake Liddell delineates the Muswellbrook Shire boundaries to the east, Wollemi National Park to the west, Aberdeen to the north and Coricudgy State Forest to the south (Muswellbrook Shire Council, 2021).

According to the 2016 census, 16,085 people lived within the Muswellbrook LGA, with an annual population growth of 0.37% since the 2011 census (Muswellbrook Shire Council, 2021). The most common level of school completion according to the 2016 census was 'year 10 or equivalent', followed by 'year 12 or equivalent'. The most common qualification level was 'certificate level' with 3,284 responses, though 'not applicable' which includes persons under 15, those with no qualification and persons still studying for first qualification was almost double with 9,500 responses. The most common work status identified for the region was 'employed, fulltime', closely followed by 'not in the labour force'. Except for the 'not applicable' category for those not in work or under the age of 15, the mining industry was the most common employment industry at 1503, with retail the second most common at 557. Most people employed travelled to work via car as a driver with 4,847 responses.

According to the Muswellbrook Shire Council website *"Muswellbrook's Gross Regional Product (GRP) is estimated at \$4.081 billion. Muswellbrook represents 7.1% of Hunter Region's Gross Regional Product (GRP) of \$57.573 billion, 0.7% of New South Wales's Gross State Product (GSP) of \$625.405 billion, and 0.2% of Australia's Gross Domestic Product (GDP) of \$1.947 trillion"* (Muswellbrook Shire Council, 2021).

The Socio-Economic Indexes for Areas (SEIFA) ranks geographic areas across Australia in terms of their relative socio-economic advantage and disadvantage. A low SEIFA score indicates relatively greater disadvantage, and conversely a high SEIFA score indicates a relative lack of disadvantage. Across Australia's local government areas SEIFA scores range from 188 (most disadvantaged) to 1186 (least disadvantaged). Figure 3-1 shows the Muswellbrook LGA's rank 119 out of 544. This denotes that there are 425 LGA's less disadvantaged than the Muswellbrook LGA.

Muswellbrook (A)

SEIFA Score

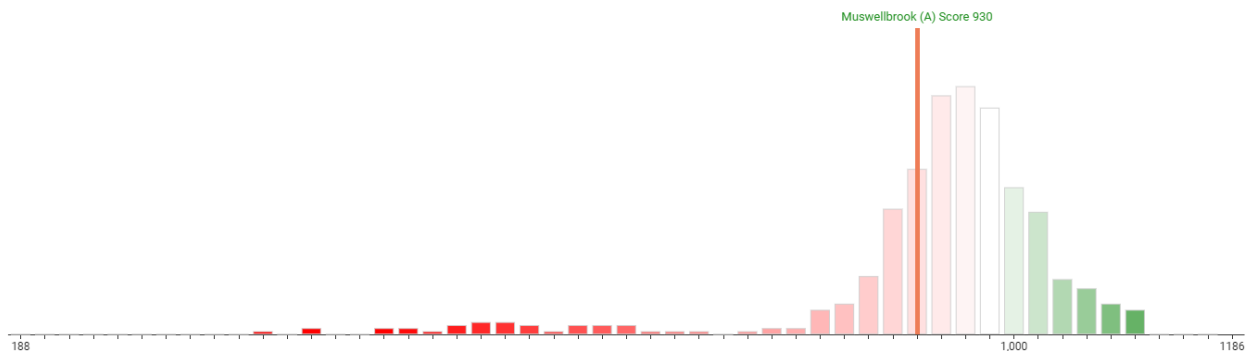


Figure 3-1 Muswellbrook LGA SEIFA score

Mining

The Muswellbrook Shire Council website identifies mining as the largest employment industry, supporting an estimated 3,120 jobs, in the Muswellbrook LGA. The most common age group employed in mining are the 35-44 age group (968), followed by the 25-34 age group (825) (Muswellbrook Shire Council, 2021).

Mining contributes the most regional exports with \$3.973 billion in output which accounts for 75.6% of total economic output for the region within the Muswellbrook LGA.

Mining contributes the largest economic output to the Muswellbrook LGA at an estimated \$4.193 billion representing 59.1% of total economic output.

The Mining industry sector is the largest value-added contributor with \$2.698 billion accounting for 69.3% of all value added within the Muswellbrook LGA (Muswellbrook Shire Council, 2021).

Agriculture

The Muswellbrook Shire Council website identifies an estimated 541 jobs in the Muswellbrook LGA as being within the agriculture sector. The most common age group employed in agriculture are the 55-64 age group (108), followed by the 45-54 age group (102) (Muswellbrook Shire Council, 2021).

Agriculture contributes \$146.574 million to the economic output of the Muswellbrook LGA, the sixth highest industry contributor.

Tourism

The Muswellbrook Shire Council website identifies an estimated 365 jobs in the Muswellbrook LGA as being within the tourism sector (3.6%) of the total jobs in the Muswellbrook LGA.

Accommodation and food services visitor expenditure is the largest within the Muswellbrook LGA at \$0.43 per dollar.

Tourism contributes \$73.768 million to the economic output of the Muswellbrook LGA.

Denman provides a base for tourists to visit local wineries including the Small Forest and Two Rivers Wines, national parks such as Wollemi and Goulburn Rivers, as well as providing hospitality

services within Denman itself including cafes, pubs and the Denman Farmers Market on the first Saturday each month (Destination NSW, 2021).

Muswellbrook, located in the heart of the upper hunter is a gateway for tourists to explore the Upper Hunter region including Mount Royal National Park and Barrington Tops National Park, Lake Glenbawn, and various food and wine destinations including Hunter Belle Cheese, Pukara Estate and wineries (Destination NSW, 2021). Local events such as the Upper Hunter Regional Show and the Muswellbrook Gold Cup racing event attract tourists to Muswellbrook.

3.1.2 Muswellbrook

History

The Hunter and Goulbourn Rivers were a meeting place for Aboriginal people, before Europeans discovered the area in 1819 (Muswellbrook Shire Council, 2021). The first residential blocks were sold in 1834, with the great northern railway meeting with Muswellbrook in 1869. Early Muswellbrook industry was dominated by agriculture, boasting a flourmill, brewery, cattle saleyards, milk and butter factory in its early years. Viticulture and wine making have become more prominent industries in recent years (Muswellbrook Shire Council, 2021).

Since 1907 coal mining and power generation have become the leading industries within the Muswellbrook Shire region, with the Liddell and Bayswater power stations being constructed in the 1970's and 1980's (Muswellbrook Shire Council, 2021).

Present Day

According to the 2016 census, Muswellbrook has a population of 12,072. Muswellbrook is located 25 minutes from Denman, and 1 hour and 40 minutes from Newcastle (Muswellbrook Shire Council, 2011). Land use surrounding Muswellbrook includes industrial e.g. mining and power production and agricultural e.g. farming.

Retail trade was the biggest industry employer in the 2016 census for Muswellbrook, employing 605 people, closely followed by Health Care & Social Assistance employing 604 people. (Muswellbrook Shire Council, 2021).

According to the 2016 census, 16,085 people lived within the Muswellbrook LGA (12,072 in Muswellbrook itself), with an annual population growth of 0.37% since the 2011 census (Muswellbrook Shire Council, 2021). The most common age of residents in Muswellbrook are 30-39 years (1,737) and 20-29 (1,700).

3.1.3 Denman

History

Traditional Aboriginal society in the Upper Hunter Valley had almost completely disappeared by the end of the nineteenth century (Muswellbrook Shire Council, 2012). With European colonisation, the emergence of small towns and villages such as Singleton, Carrowbrook, Ravensworth, Muswellbrook, Scone, Aberdeen, Murrurundi, Quirindi, Denman, Jerry's Plains, Broke and Wollombi occurred.

Within the Denman district, Merton was the first European settlement located east of current Denman on the opposite side of the Hunter River. The town of Merton became the centre of justice

in the district by 1825, however the headquarters for police moved to Muswellbrook shortly after in 1837 (Muswellbrook Shire Council, 2012).

In 1853 the village of Denman in the parish of Denman was gazetted, with most residents of Merton moving across the Hunter River to present day Denman to be closer to the river (Muswellbrook Shire Council, 2012).

During the 1980's a concrete sleeper plant supplying sleepers to the State Rail Authority operated in Denman (Muswellbrook Shire Council, 2012). More recently coal mining, vineyards and tourism has dominated the industry profile.

Present Day

According to the 2016 census, Denman had a population of 1,789. Denman is located 25 minutes from Muswellbrook, and 1 hour and 50 minutes from Newcastle (Muswellbrook Shire Council, 2011). Denman has RFS and SES facilities, sporting fields, community hall and various cafes and local shops. The region benefits from the surrounding vineyards, bringing tourists to the town, as well as surrounding mines providing employment opportunities.

Agriculture, forestry and fishing was the biggest industry employer in the 2016 census for the Denman region, employing 109 people. In total 477 people are employed full-time, and 300 people are employed in part-time work or employed away from work (Muswellbrook Shire Council, 2021).

According to the 2016 census, 16,085 people lived within the Muswellbrook LGA (1,789 in Denman itself), with an annual population growth of 0.37% since the 2011 census (Muswellbrook Shire Council, 2021). The most common age of residents in Denman are 19-29 years (276) and 40-49 (253).

3.1.4 Singleton

History

European discovery of the Singleton area occurred in 1820, by John Howe and was named for Benjamin Singleton. It was first known as St Patrick's Plains and shortened to Patrick's Plains as the name of the shire area and council (Singleton Council, 2021).

The District Council of Patrick Plains was appointed in 1843, and the Municipality of Singleton proclaimed in 1866. Both councils amalgamated in 1975 and the shire of Singleton was inaugurated in 1976 (Singleton Council, 2021).

Present Day

According to the 2016 census, Singleton had a population of 22,987. Singleton is located 35 minutes from Muswellbrook, and 1 hour and 5 minutes from Newcastle. Singleton has a growing population when comparing 2016 ABS Census results to the 2011 Census figure of 16,135.

Of the Singleton population, 57.7% are employed full-time and 30.4% have part-time work. The most common occupations in Singleton include technicians and trades workers (17.8%), machinery operators and drivers (17.3%), professionals (12.3%), community and professional service workers (11.3%) and managers (11%) (Singleton Council, 2021). Coal mining employs 22% of the Singleton population who work.

The majority of people in Singleton are working age (30-64 years), representing 46.1 per cent of the overall population. However, the single largest age cohort is 5-9 years with 1,759 people representing 7.65 per cent of the population (Singleton Council, 2021).

4. Stakeholder Groups and Consultation Strategies

It is important to identify key stakeholder groups and relevant characteristics of each of the groups so that engagement strategies can be tailored to best suit them. Different levels of engagement will be appropriate for different groups, depending on the potential interest or impacts on the groups.

Where impacts are minor, the International Association for Public Participation (IAP2) consultation spectrum suggests approaches such as 'Inform' and 'Consult'; and where impacts are greater, approaches such as 'Involve', 'Collaborate' and 'Empower'.

Proposed strategies are set out in Table 4-1 for each stakeholder group. Levels of engagement may change during the planning process, depending on issues identified during the consultation process.

Table 4-1 Consultation strategies

Stakeholder group	Defining characteristics	Consultation strategies
1. Adjacent landowners and near neighbours	Neighbours on land adjacent to the subject site boundaries, with a potential to experience impacts (noise, air quality, etc) as a result of the construction and operation of the Proposal. Six properties are located within one kilometre of the Proposal, and will be directly affected as a result of the proposed HRSF. One property is located directly across Denman Road, from the Study Area.	Inform, consult, involve, collaborate Consultation will be undertaken as part of the Proposal's development. If properties are affected by impacts, these will be assessed in accordance with statutory requirements. Initial consultation with this group will involve contact by phone, email and / or post providing Proposal and proponent contact details and offering to meet face to face. They will also be invited to attend an open house to discuss any concerns or questions they may have about the Proposal face to face subject to and conforming to any potential COVID-19 restrictions.

Stakeholder group	Defining characteristics	Consultation strategies
2. Densely populated areas of Denman local community and Muswellbrook local community	Impacts for this group would be less than adjacent properties but being a major development with primary access from Denman Road, properties with direct access from this road would be impacted during construction. .	Inform, consult, involve Understanding the values and potential impacts to this group is highly important. It will assist the assessment process and development of appropriate mitigation strategies. It will also assist in gaining social license from the local community to operate. Initial consultation with this group will involve advertising of the development in a local newspaper, informing the local community and businesses of the development, Proposal website, feedback mechanisms and the opportunity to join the Proposal mailing list. These adverts will also invite the local community and businesses to attend an open house subject to and conforming to any potential COVID-19 restrictions. At the open-house a newsletter introducing the proposed HRSF will be distributed to attending persons. The Proposal mailing list will also be sent this newsletter.. All consultation will be documented in a consultation log.

Stakeholder group	Defining characteristics	Consultation strategies
3. Local small business owners	Local businesses in the town of Denman and regional city centre of Muswellbrook may be impacted positively by the influx of workers during construction. This development may be of particular interest to business owners in the area. Opportunities and potential impacts will need to be considered. Local business can benefit the Proposal by distributing information about the Proposal and may play a large part in influencing community opinions. Pukara Estate and Hunter Valley Camels are likely to have a particular interest in the Proposal.	Inform and consult Understanding the values and potential impacts to this group is highly important. It will assist with the assessment process and development of appropriate mitigation strategies and in gaining social license to operate from the local community. Initial consultation with this group will involve advertising of the development in a local newspaper, informing the local community and businesses of the development, Proposal website, feedback mechanisms and the opportunity to join the Proposal mailing list. These adverts will also invite the local community and businesses to attend an open house subject to and conforming to any potential COVID-19 restrictions. At the open-house, a newsletter introducing the proposed HRSF will be distributed to attending persons. The Proposal mailing list will also be sent this newsletter. All consultation will be documented in a consultation log.
4. Representative bodies	Representatives of groups such as: • Muswellbrook Shire Council including Mayor Martin Rush, Deputy Mayor Rod Scholes and other councillors • Wanaruah Local Aboriginal Land Council • Bathurst Local Aboriginal Land Council • State member for the Upper Hunter, and Federal member for the Hunter, Joel Fitzgibbon. • Ausgrid and Transgrid	Inform and consult Tailored information may be required for these groups. An avenue to receive information and provide specific feedback or ask questions will be provided. An email or letter will be sent to these stakeholders providing them with Proposal and proponent details. They will also be invited to provide direct feedback to the proponent through email or teleconference calls.

Stakeholder group	Defining characteristics	Consultation strategies
5. Special interest groups	There may be benefit in contacting special interest groups, to ensure that any special areas of interest will be addressed in the assessment of the Proposal. Local information can be important for the assessment stage. Some that have been identified specific to this Proposal include: • Denman Chamber of Commerce • Muswellbrook Chamber of Commerce • Upper Hunter Tourism • NSW Minerals Council • Muswellbrook Lions and Muswellbrook Rotary Clubs • Local action groups including Hunter Valley Protection Alliance and the Lock the Gate Alliance.	Inform Each group will be specifically contacted via email or phone. Specific information or assessment may be required to understand and mitigate impacts for these groups. These stakeholders will have access to the latest Proposal information such as by newsletter and website. An avenue to provide feedback or ask questions will be provided.
6. Broader community	It is important to ensure a clear and consistent message is delivered to the broader community. There may be opportunities and impacts to the broader community that are important to understand during the assessment of the Proposal. Accommodation and services for Proposal construction staff and other economic matters may be of interest.	Inform An advertisement in a local publication will be used to relay information about the Proposal. A contact will be provided to this group, for further information / provision of feedback.

Stakeholder group	Defining characteristics	Consultation strategies
7. Agencies	• Muswellbrook Shire Council • Singleton LGA • Transport for NSW (TfNSW previously Roads and Maritime Services) • Rural Fire Service • National Parks and Wildlife Service • Environment Protection Authority • NSW Department of Planning, Industry and Environment (DPIE) – Water • DPIE– Crown Land • DPIE – Regions, Industry, Agriculture and Resources • Forestry Corporation of NSW • Department of Primary Industries – Fisheries • DPIE - Energy, Climate Change and Sustainability Division • DPIE - Heritage Council of NSW • Energy NSW • Australian Government – Department of Environment, Water, Population and Communities • NSW Health • NSW Local Land Services – Hunter	Inform and consult Specific information may be required from these groups during the DPIE's assessment of the application. Targeted consultation by way of emails, phone calls and meetings will assist the assessment process and development of appropriate mitigation strategies.

5. Issue Management

A set of Proposal-specific issues and risks to maximising community engagement in the Proposal have been identified below. These issues pose potential risks to the effective identification and mitigation of impacts important to the community and ultimately, to achieving social license to operate from the community. Strategies have been developed below, specific to the identified issues. These have been incorporated into the Proposal-based Activities, in Section 6.

Table 5-1 Proposal specific issues

Issue	Risks	Strategies
The Proposal may define and/or overwhelm the character of the town of Denman and regional city centre of Muswellbrook	This may polarise the community. They may not feel that the Proposal reflects their community values. The scale of the Proposal may overwhelm the existing local character.	Early and easily accessible distribution of information about the Proposal and its specific justification and benefits, particularly material about the role of solar energy in the country's renewable energy mix, the technology and its impacts. At the open-house, seek direct input into how the Proposal may reflect the community's 'personality' and values. How the benefits of the Proposal may be spread to the local community. Clear communication of key environmental impacts and mitigation strategies of the Proposal using newsletters, Proposal website, complaints/feedback mechanisms.
Spread of misinformation / feel left out of engagement	Rural residences can be difficult to contact and word of mouth travels very fast in small communities. Feel left out, disengaged, misinformed.	Early direct communication to local community – adjacent landowners and nearby neighbours first, then the wider community. Employ multiple means to identify all relevant residences. It can be difficult to locate all residences and contact all landowners, as such advertising in a local publication can be used to reach a broader audience.

Issue	Risks	Strategies
Lack of support for the Proposal	Lack of interest, leading to low levels of public support. Community could be against the Proposal due to unaddressed concerns.	Early and easily accessible distribution of information including but not limited to the Proposal's: • Justification and benefits as well as community benefits; • Environmental and social impacts and mitigation strategies; and • Community relationship strategies. Create a clear and trusted communication channel exclusively for the community to provide comments. Make participation easy and effective so that everyone within the community is heard and their comments taken into consideration. Ensure all concerns are addressed and distributed; and informed when these are available for the community. Be creative – seek support for renewable energy by demonstrating how benefits can be contributed to the local community level, including with special interest groups and local businesses.
The approvals process can be long and complex.	Perception that the process is too difficult to become involved in. Suspicion that input will not be valued. Overly technical information provided, use of jargon.	Clearly illustrate approvals process. Clearly define opportunities for community input including what is required and when it is required.
Distrust in environmental assessment process.	Distrust of impact identification and mitigation strategies.	Make participation easy and effective so that everyone within the community is heard and their comments taken into consideration. Provide a logical and/or evidence based plain English explanation on how impacts will be mitigated. Empower the community with appropriate and easy to understand information.

Issue	Risks	Strategies
Representative bias	Risk of biased consultation, serving only the 'squeaky wheel'. Sections of the community may be "overpowered" and may be marginalised.	Ensure community consultation representatives possess appropriate training and understands the execution of public forums. This strategy is aimed to provide the community with a polite and outstanding social skills person representing the Proposal. Ensure community is engaged in a polite and "at same level" manner; and in a forum that minimises risk of groups mismanagement or debate being side tracked. Follow up with smaller groups where required. Use established media channels in distribution of materials, i.e. company website, newsletter or local newspaper.
Unified message	Differing messages may create confusion and mistrust.	Create a clear and trusted communication channel exclusively for the community to provide comments. Prepare concise, detailed and direct messages in plain English that are clearly set out for use rather than reinventing it for each consultation activity.
Unequal perception of impacts	Residents close to the development are likely to have stronger positive or negative opinions	Identification of stakeholder groups should reflect differences in perceived impacts.

6. Proposal Based Activities

Table 6-1 outlines the different Proposal stages and associated community consultation objectives and activities, in chronological order. The stages include:

- Decision to proceed with early investigations and Proposal development.
- Undertaking of community/stakeholder consultation
- Preparation and lodgement of request for Secretary's Environmental Assessment Requirements (SEAR's) to Department of Planning Industry and Environment (DPIE)
- Receipt of SEARs from DPIE which will form part of the EIS format and content requirements
- Preparation of EIS and development application
- Lodgement of development application accompany with the EIS
- EIS on public exhibition and response to submissions
- Assessment from DPIE

Further stages will apply pending Proposal approval.

During this progression, key achievements should be celebrated, and used as an opportunity to keep the community on board. Key achievements can include:

1. Announce Proposal –notify near residents first, follow up with consistent information.
2. Early studies update – meet the community face to face during an open house event to provide Proposal & proponent details and give the community the opportunity to provide feedback.
3. Approval.

Table 6-1 Proposal stages

Stakeholder group	Issue	Consultation Strategy	Community engagement targets	Format
Decision to proceed with early investigations, Proposal development, and receipt of SEARs				
Adjacent landowners and near neighbours	Misinformation / left out of engagement. Lack of support for Proposal.	Inform, consult, involve, collaborate	Early distribution of information about solar energy development generally. Early distribution of information about the Proposal and its justification and benefits. Seek direct input to include in assessment approach and development of Proposal.	Initial contact through phone, email or post. Invitation to face to face meeting with Proponent at an open-house. Encourage ongoing direct contact with Proponent during Proposal development.
Denman and Muswellbrook local community	Misinformation / left out of engagement. May define locality. Lack of support. Unequal perception of impacts.	Inform, consult and involve	Early distribution of information at an open-house about solar energy development generally. Early distribution of information at the open-house about the Proposal and its justification and benefits.	Initial introduction to the Proposal through an advert in a local paper inviting attendance at a face to face meeting with the Proponent at an open-house and invitation to sign-up to Proposal email mailing list. Newsletter introduction to the Proposal and contact numbers provided for feedback at the open-house. Issue newsletters at milestones to email mailing list.

Stakeholder group	Issue	Consultation Strategy	Community engagement targets	Format
Local small business owners, and representative bodies	Misinformation / left out of engagement. Lack of support for the Proposal.	Inform and consult	Make information on the Proposal team and assessment team available. Build relationship with these owners and staff as they may assist to 'get the word out'. Discuss specific impacts and opportunities.	Initial introduction to the Proposal through an advert in the local paper inviting attendance at a face-to-face meeting with the Proponent at an open-house and invitation to sign-up to Proposal email mailing list. Newsletter introduction to the Proposal and contact numbers provided for feedback at the open-house. Issue newsletters at milestones to email mailing list.
Broader community and special interest groups	Distrust in environmental assessment process. The approvals process can be complex.	Inform	Make information on the Proposal team and assessment team available. Empowered community.	Initial introduction to the Proposal through adverts in a local paper inviting attendance at a face to face meeting with the Proponent at an open-house and invitation to sign-up to Proposal email mailing list. Newsletter introduction to the Proposal and contact numbers provided for feedback at the open-house. Issue newsletters at milestones to email mailing list.

Stakeholder group	Issue	Consultation Strategy	Community engagement targets	Format
Agencies	May hold site specific information that is required to be considered early in the design process.	Inform and consult	Discuss specific impacts and opportunities.	Phone call/seek initial feedback
Detailed assessment and Proposal development				
Adjacent landowners and near neighbours	Lack of support.	Inform, consult, involve, collaborate	Discuss and understand specific impacts on these receivers. Feed information into the final assessment to ensure all their issues have been identified and addressed by the Proposal.	Phone call and email communication.
Denman and Muswellbrook local community Local small business owners, and representative bodies	Distrust in environmental assessment process. Unequal perception of impacts. Risk of biased consultation, serving only the 'squeaky wheel'.	Inform and consult	Update community on detailed Proposal environmental assessment process including its impacts and mitigation strategies. Seek input – any additional concerns, that have not been heard or included in the assessment. Feed information into the final assessment to ensure all community issues have been identified and addressed by the Proposal, differentiating between stakeholder groups.	Newsletters to be sent to email mailing list providing updates on Proposal progress and seeking feedback.
Broader community and special interest groups	Representative bias.	Inform and consult	Outline ways they can continue to have input into Proposal. Seek broad feedback on how the community view solar Proposals generally and this Proposal specifically.	Media release, link to website (including feedback form).

Stakeholder group	Issue	Consultation Strategy	Community engagement targets	Format
Agencies	Statutory obligations.	Inform and consult	Address Agency comments from SEARs and consult as necessary	Phone call and direct email responses. The more evidence the better.
EIS on public exhibition, submissions reporting				
Adjacent landowners and near neighbours	Relationship with landowners and community.	Inform, consult, involve and collaborate	Update on Proposal status.	Provide phone call or email updates.
Denman and Muswellbrook local community	Relationship with community.	Inform and consult	Update on Proposal status. Outline ways they can continue to have input into Proposal.	Newsletter update sent to email mailing list.
Broader community	The approvals process can be long and complex.	Inform	Update on Proposal status. Outline ways they can continue to have input into Proposal.	Proposal updates to be published on the website.
Approval determination				
Adjacent landowners and near neighbours	Relationship with landowners and community	Inform, consult, involve and collaborate	Update on Proposal status.	Provide phone call or email updates.
Denman/Muswellbrook local community	Relationship with community	Inform	Update on Proposal status. Thank the community for their involvement.	Newsletter update sent to email mailing list.
Broader community	Relationship with community	Inform	Update on Proposal status. Thank the community for their involvement.	Proposal updates to be published on the website.

7. Monitoring and Evaluation

To ensure this plan is effective during the implementation of activities, and adapts as required to new information, the following review actions will be undertaken by the Proponent alongside implementation activities:

- Appoint and maintain a consultation manager for the Proposal to implement activities and review this plan regularly.
- Keep an accurate record of all feedback from consultation activities and all correspondence with the community.
- Monitor regularly and respond promptly to email and phone queries.
- Monitor if the activities are reaching a diverse and representative section of the community. Subject to the monitoring results, consider if new activities need to be implemented.
- Ensure that all Proposal related information and updates have been shared with:
 - The team developing the detailed Proposal description;
 - The team managing information channels including, social media, website, hotline, etc.

Appendix C Evidence of consultation

1 July 2021

Dear Resident,

Proposed Hunter River Solar Farm

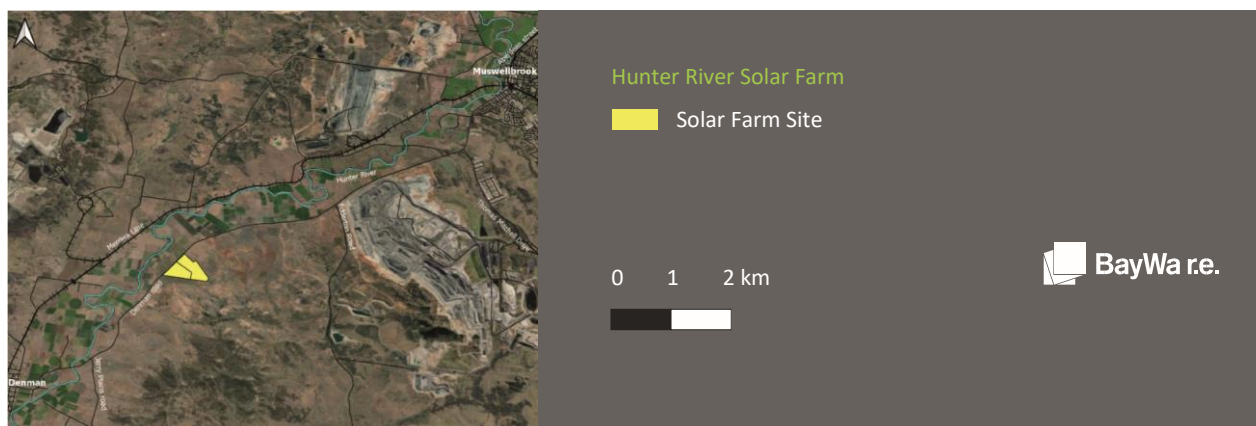
We write to inform you of our proposal to develop a solar farm approximately 13 km south-west of Muswellbrook, New South Wales. This letter will introduce you to the proposed project and provide information about the planning process.

About BayWa r.e.

BayWa r.e. is a leading global renewable energy developer, service provider, distributor and energy solution provider. Founded in February 2009 and currently employing approximately 2,700 employees globally, a presence in Australia was established in 2017. BayWa r.e. has realised over 3.5 GW of solar and wind projects globally with 13.6 GW of projects currently under development.

About the Solar Farm

The location of the proposed Hunter River Solar Farm is approximately 13 km south-west of Muswellbrook, NSW along Denman road. A map of the site is shown below:



The solar farm will have a capacity of approximately 84 MWp DC / 60 MW AC and it will connect into the local 66 kV electrical network. The facility will produce enough power for about 17,000 homes, which would have a greenhouse gas benefit equivalent to planting approximately 1 million trees. The estimated energy and environmental benefits of the Hunter River Solar Farm are shown in the table below:

Energy output per year	147,000 MWh
Greenhouse gas abatement per year	100,000 Tons of CO ₂
Equivalent number of households supplied	~17,000
Equivalent number of cars taken off the road	~20,000
Equivalent number of trees planted	~1,000,000

This site was chosen for the following reasons:

- It receives a large amount of sunshine.
- It is near the electrical grid.
- It offers easy access.

Connection to the Electricity Grid

The solar farm will not require any new power lines. Instead, it will connect into the existing local electrical network.

Development Consent Process

The Preliminary Environmental Assessment for the Hunter River Solar Farm is expected to be lodged with the Department of Planning, Industry and Environment (DPIE) in 2021. Following issue of the Secretary's Environmental Assessment Requirements, the Environmental Impact Statement for the project will be finalised and cover the impact of the project on the following aspects:

- Flora and fauna.
- Cultural heritage.
- Visual impact.
- Stormwater and flood.
- Traffic.
- Dust and noise.
- Bushfire.

After submissions to the DPIE, documents relating to the solar farm's development application will be made available on the DPIE website as well as on our project website (www.hunterriversolarfarm.com.au).

Construction Process

Once a permit has been issued and financing completed, construction of the solar farm can begin and will take around 18 months. The construction process starts with construction of the solar farm boundary fence, access tracks and lay-down pads. This is followed by installation of the tracking system structure, solar panels, underground cabling and grid connection infrastructure (sub-station and switching station). The final stage is the commissioning of the solar farm and connection into the local electricity grid so that the export of energy can begin.

Additional Information and Feedback

More information about this project is available on the project website: www.hunterriversolarfarm.com.au. We welcome your feedback on this project. This can be provided through the project website or by emailing: info@baywa-re.com.au.



14 May 2021

Ausgrid Reference Number: AN – 21469 (AE700006731)

Mr Thomas Parel
BayWa r.e. Projects Australia Pty Ltd
45 Denison Street
Bondi Junction, NSW, 2022

Email: Thomas.Parel@baywa-re.com

24-28 Campbell St
Sydney NSW 2000
All mail to
GPO Box 4009
Sydney NSW 2001
T +61 2 131 525
ausgrid.com.au

Dear Thomas,

Detailed Enquiry Response – Hunter River 60MW Solar Farm

Further to your preliminary enquiry dated 7 July 2020, subsequent information exchange and payment of fees and charges, I am pleased to provide the following information to assist in the planning of the electrical connection of the above development.

General Information

Facilitation of all new connections at 33kV, 66kV and 132kV, services for Registered Participants of the National Energy Market, as well as generation connections within the Ausgrid network are managed by the Customer Relations and Major Connections Group. Our role is to help ensure these connection proposals are provided with the ongoing attention they require, from inception through to final commissioning.

The diagram below provides an overview of the high-level process required for most large connection projects, based on the National Electricity Rules (NER), applicable legislation, regulations and business policies. There are particular elements or milestones which need to be achieved to progress through these key phases.



The connection applicant and Ausgrid both have significant parts to play in this process. The timeframes and requirements may vary significantly depending on the extent of technical issues and associated infrastructure works.

The Application for Connection will need to be developed in consultation with Ausgrid. The feasibility and detailed requirements for the generator connection will need to be ascertained through a range of technical assessments. Various assessments will need to be undertaken by BayWa r.e. Projects Australia as part of developing a detailed Application for Connection and also by Ausgrid in preparing a subsequent Offer to Connect.

Ausgrid's connection processes and related documents are available on the Ausgrid website www.ausgrid.com.au under "Connections".

Table 1 below provides a preliminary program showing typical milestones and activities for establishing a connection.

Table 1: Preliminary Time Frames for Establishing a Connection

	Milestone or Activity	Coordinated By	Date / Duration
	Initial Planning Study Request Response & Design Contract	Ausgrid	13 August 2020
	Acceptance of Fees & Design Contract	Customer	14 August 2020
	Connection Options/System Planning Review	Ausgrid	13 October 2020
	Acceptance of Fees for Preliminary Enquiry Detailed Response	Customer	29 March 2021
	Preliminary Enquiry Detailed Response (NER S5.4B)	Ausgrid	14 May 2021
	Develop and Submit Generator Connection Application	Customer	
	Perform Generator Connection Application Due Diligence	Ausgrid	Subject to complexity
	Offer to Connect (NER 5.3.4)	Ausgrid	
	Prepare Contestable Design Information	Ausgrid	12 weeks
	Develop Contestable Design Package	Customer / ASP3	
	Review and Certify Design Package (allow minimum 6 weeks per submission and at least 2 submissions)	Ausgrid / Customer	Subject to complexity
	Prepare Negotiated Connection Offer and Construction / Commissioning Fee Estimates	Ausgrid / Customer	Up to 6 weeks
	Construction, Audit & Compliance	Customer / ASP1 / Ausgrid	3 - 18 months (subject to complexity)
	Testing and Commissioning	Ausgrid / Customer	2 - 4 weeks
	Post Commissioning Analysis	Ausgrid / Customer	

This detailed enquiry response is provided in accordance with Clause 5.3A.8 and Schedule 5.4B of the National Electricity Rules (NER) and provides information to assist in the development of an Application for Connection. Where updated information relevant to Clause 5.3A.7 and Schedule 5.4A has been provided that supersedes the preliminary enquiry response provided previously, it has been set out below. To assist in reviewing the information provided, each clause is shown in italics with the Ausgrid response following.

NER Schedule 5.4A - Part A

For the purposes of clause 5.3A.7(a), the following information must be included in the preliminary response:

(a) relevant technical information about the Distribution Network Service Provider's distribution network, including guidance on how the Connection Applicant may meet the following requirements if it were to proceed to prepare an application to connect:

1. *Primary protection and backup protection;*

The existing protection schemes on CB 60272 at Mitchell Line STS and CB 60340 at Denman ZS are insufficient for the proposed network augmentation, with the exception of the existing Directional OCEF on CB 60340.

Ausgrid standard design 'A' and 'B' 66kV feeder protection shall be installed on CB 60272 at Mitchell Line to make allowance for the following:

- Three ended network feeder – line differential ('A') and Distance/Directional OC&EF ('B') protection

Ausgrid standard design 'A' 66kV feeder protection shall be installed on CB 60340 at Denman ZS to make allowance for the following:

- Three ended network feeder – line differential ('A') with the existing Directional OC&EF being retained as the ('B') protection

To facilitate the generator connection, Ausgrid Control & Protection Engineering will be required to conduct a settings review and make settings changes where required to allow for the three-ended scheme and raising of OCEF settings throughout the network.

2. *Other protection and control requirements applicable to embedded generating units and associated plant;*

Proposed HVC Substation

Feeder Protection

Ausgrid standard duplicate 66kV feeder protection shall be required on all feeders made up of:

- 'A' protection relay implementing three-ended line differential interfacing with the Ausgrid network upstream with Directional OC&EF to be implemented in the same relay.
- 'B' protection relay implementing two-ended line differential interfacing downstream with the customer network to be implemented.

Current approved protection relays, CTs and VTs (as required) shall be utilised for all protection schemes.

DC Supply

A single 110V battery and DC board are required.

Hunter River Solar Farm Connection

Protection settings for the Hunter River Solar Farm feeder including logical functionality are to be specified as part of a Protection Conceptual Agreement (PCA) produced by Ausgrid Control and Protection Engineering in negotiation with the customer.

Feeder Protection

Compatible Ausgrid standard feeder protection shall be installed to interface with the 'B' protection relay on the proposed HVC substation i.e. single line differential protection. The relay and CTs shall be selected from the approved materials list.

Generator Connection

The customer is to determine the appropriate protection for their generator considering the requirements of the National Electricity Rules (NERs).

The generator will need to limit its contribution to fault current in response to faults involving earth due to the earth fault limited network supply arrangements.

Anti-Islanding Protection

Anti-islanding protection shall meet the requirements of NS194 where not in conflict with Schedule 5.2 of the NER with detailed settings to be negotiated with Ausgrid to provide appropriate fault ride-through capability. Rate of Change of Frequency (ROCOF) and Vector Shift protection requirements to be negotiated (inter-tripping may not be effective to detect all islanded conditions).

The Neutral Voltage Displacement (NVD) settings to be negotiated with Ausgrid considering the required fault ride-through capability.

3. *Remote monitoring equipment and control communications facilities;*

The existing communications infrastructure at Mitchell Line STS and Denman ZS is suitable for this option. Modifications to SCADA equipment at each location may be required and the associated costs to do so will be provided at application for connection stage.

Proposed HVC Substation

New fibre infrastructure shall be constructed to intercept Ausgrid's fibre network to support a SCADA connection, line differential and/or intertripping protection. There is currently a fibre connection on the adjacent Mitchell Line to Denman feeder 6025.

The HVC substation shall be equipped with SCADA and communications systems utilising approved equipment.

To comply with Ausgrid's Licence Conditions relating to cybersecurity, the customer must not connect directly to Ausgrid's SCADA network. If required, an additional SCADA gateway device may be installed at the switching station to provide an interface between Ausgrid and the customer's SCADA networks. This gateway shall connect via fibre to the customer's SCADA device. The gateway device shall connect to the local substation SMU by DNP3 or IEC 61850.

Fibre Route to Hunter River Solar Farm

A single fibre shall be provided between the proposed HVC substation and the customers installation to enable the use of line differential protection and intertripping for anti-islanding and circuit breaker fail. Allowance shall be made for indication of the feeder CB at the Hunter River Solar Farm installation.

4.-9. *As per 5.4A response*

NER Schedule 5.4A - Part C:

**Table 2 has not changed but is provided for reference*

Table 2: Technical Requirements - Access Standards

Technical Requirement	Automatic	Minimum	Negotiated
Generator Reactive Power Capability	In accordance with NER S5.2.5.1	In accordance with NER S5.2.5.1	In accordance with NER S5.2.5.1
Generator Quality of Supply Generated	In accordance with NER S5.2.5.2	In accordance with NER S5.2.5.2	In accordance with NER S5.2.5.2,
Generator Response to Frequency Disturbances	In accordance with NER S5.2.5.3	In accordance with NER S5.2.5.3	In accordance with NER S5.2.5.3, Subject to AEMO advice
Generator Response to Voltage Disturbances	In accordance with NER S5.2.5.4	In accordance with NER S5.2.5.4	In accordance with NER S5.2.5.4, Subject to AEMO advice
Generator Response to Disturbances following a Contingency Event	In accordance with NER S5.2.5.5	In accordance with NER S5.2.5.5	In accordance with NER S5.2.5.5, Subject to AEMO advice
Generator Quality of Supply and Continuous Uninterrupted Operation	Not applicable	In accordance with NER S5.2.5.6	Not applicable
Generator Partial Load Rejection	In accordance with NER S5.2.5.7	In accordance with NER S5.2.5.7	In accordance with NER S5.2.5.7, Subject to AEMO advice
Generator Protection from Power System Disturbances	Not applicable	In accordance with NER S5.2.5.8	Subject to AEMO advice
Generator Impact on Power System Security	In accordance with NER S5.2.5.9	In accordance with NER S5.2.5.9	Subject to AEMO advice
Generator Protection for Unstable Operation	In accordance with NER S5.2.5.10	In accordance with NER S5.2.5.10	In accordance with NER S5.2.5.10, Subject to AEMO advice
Generator Frequency Control	In accordance with NER S5.2.5.11	In accordance with NER S5.2.5.11	In accordance with NER S5.2.5.11, Subject to AEMO advice
Generator Impact on Network Capability	In accordance with NER S5.2.5.12	In accordance with NER S5.2.5.12	In accordance with NER S5.2.5.12, Subject to AEMO advice
Generator Voltage and Reactive Power Control	In accordance with NER S5.2.5.13	In accordance with NER S5.2.5.13	In accordance with NER S5.2.5.13, Subject to AEMO advice
Generator Active Power Control	In accordance with NER S5.2.5.14	In accordance with NER S5.2.5.14	In accordance with NER S5.2.5.14, Subject to AEMO advice
Generator Remote Monitoring	In accordance with NER S5.2.6.1	In accordance with NER S5.2.6.1	Subject to AEMO advice
Generator Communications Equipment	In accordance with NER S5.2.6.2	In accordance with NER S5.2.6.2	In accordance with NER S5.2.6.2, Subject to AEMO advice
Power station auxiliary supplies	In accordance with NER S5.2.7	In accordance with NER S5.2.7	In accordance with NER S5.2.6.2, Subject to AEMO advice
Generator Fault Current	In accordance with NER S5.2.8	In accordance with NER S5.2.8	In accordance with NER S5.2.8

In respect of voltage fluctuations and harmonic distortion, it should be noted that where an agreed negotiated access standard is reached, it may be necessary in the future to negotiate the movement to an automatic access standard in accordance with the NER S5.1.5(c) and NER 5.1.6(c).

NER Schedule 5.4B – Detailed Response

NER Schedule 5.4B - Part A:

S5.4B(a) the contact details for the relevant point of contact within the Distribution Network Service Provider who will manage the application to connect;

The Ausgrid point of contact responsible for managing this enquiry is:

Douglas Giles – Customer Manager – Energy Transformation
Ground Floor, Wallsend Administration Block
145 Newcastle Road,
Wallsend NSW 2287 Australia
Ph: 02 4910 1236 Email: dgiles@ausgrid.com.au

NER Schedule 5.4B - Part B:

S5.4B(b) written details of each technical requirement relevant to the proposed plant as relevant to the:

- (1) automatic access standards;* As identified within the requirements of Table 2 above and the associated attached documentation
- (2) minimum access standards;* As identified within the requirements of Table 2
- (3) any applicable plant standards;* Ausgrid's Network Standards for 66kV CB Switching Station with rated short circuit breaking current *and*
- (4) normal voltage level, if that is to change from the nominal voltage level;*

The normal voltage level is at Nominal Voltage of 66kV

NER Schedule 5.4B - Part C:

S5.4B(c) details of the connection requirements based on the Connection Applicant's specifications of the facility to be connected;

Based on information provided by Ausgrid in a Connection Options Study (System Planning Advice), the connection applicant has selected a connection point of the 66kV feeder 6027. The upstream supply arrangement providing the system normal supply to 66kV feeder 6027 is shown in figures 1 and 2.

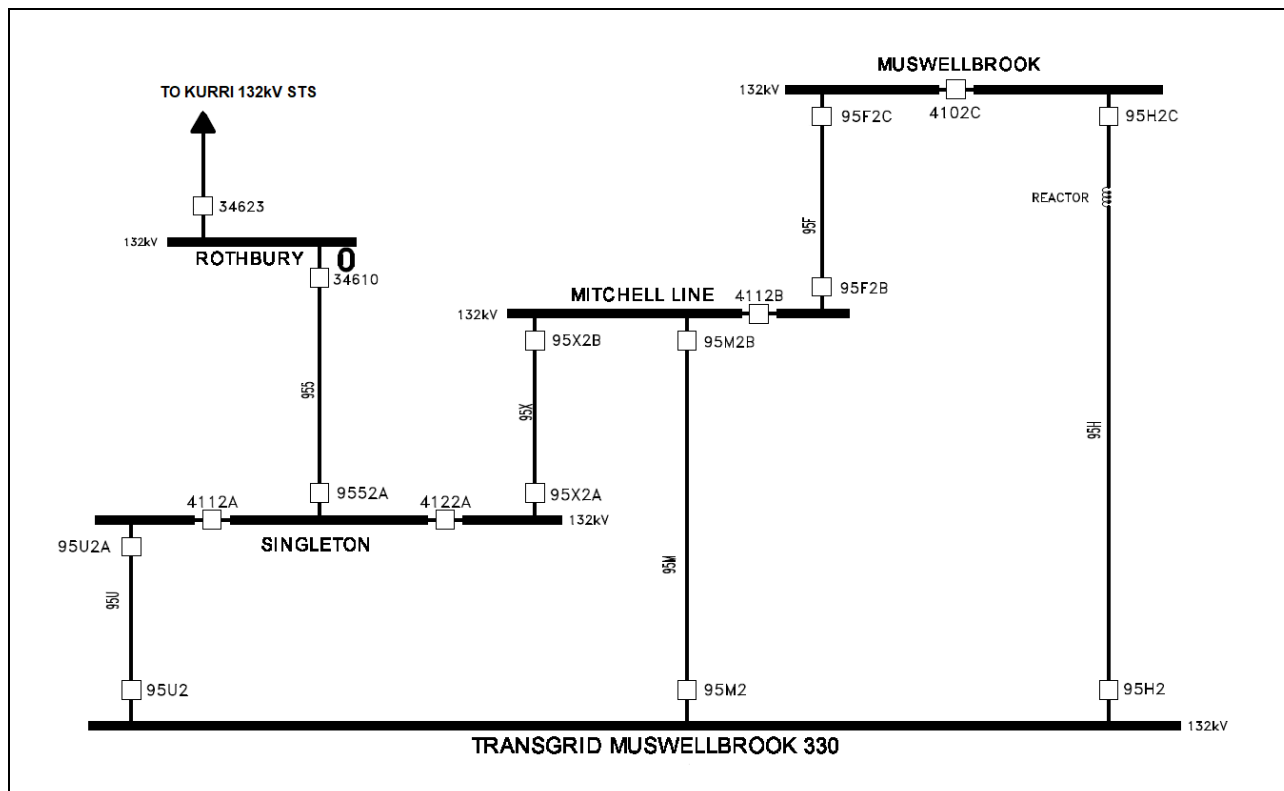


Figure 1 – Proposed Connection Arrangement

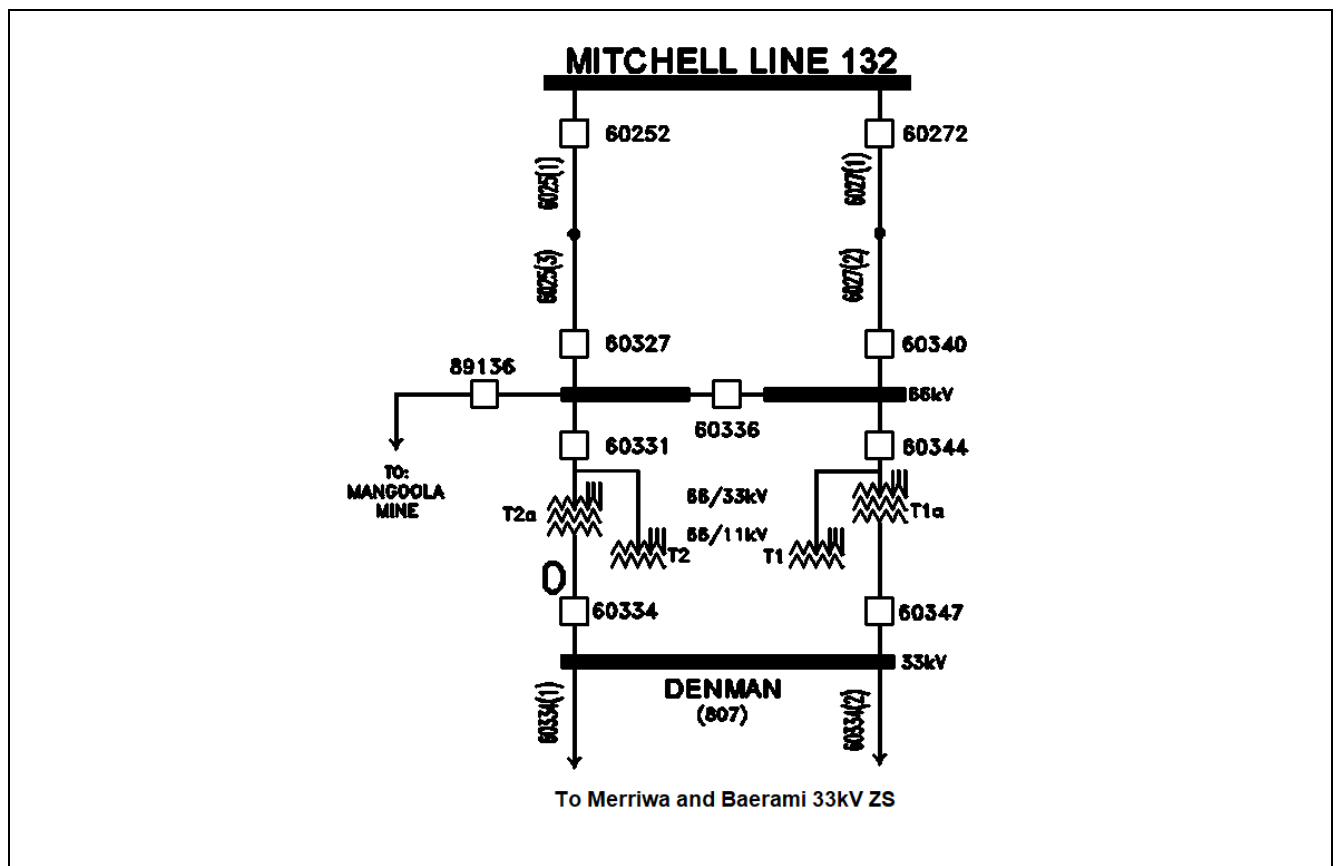


Figure 2 – Denman 66kV Subsystem from Mitchell Line 132kV Subtransmission Substation

The existing equipment ratings for the for the 132kV upstream supply network to Muswellbrook 330kV BSP are shown in table 3.

		SUMMER		WINTER		
FEEDER		AMPS	MVA	AMPS	MVA	LIMIT
132kV feeder 95H (Muswellbrook BSP to Muswellbrook)	Normal	600	137	600	137	CVT Wave Trap
	Emergency	600	137	600	137	CVT Wave Trap
132kV feeder 95M (Muswellbrook BSP to Mitchell Line)	Normal	826	189	930	213	85°C Conductor
	Emergency	1091	249	1163	266	120°C Conductor
132kV feeder 95U (Muswellbrook BSP to Singleton)	Normal	983	225	1063	243	Summer – 85°C Conductor Winter – TG Feeder Bay
	Emergency	1063	243	1063	243	TG Feeder Bay
132kV feeder 95F (Muswellbrook STS to Mitchell Line)	Normal	585	134	657	150	85°C Conductor
	Emergency	765	175	800	183	Summer – 120°C Conductor Winter – HV Isolator
132kV feeder 95X (Mitchell Line STS to Singleton)	Normal	983	225	1106	253	85°C Conductor
	Emergency	1137	260	1241	284	100°C Conductor

Table 3 – Upstream 132kV Supply Network Equipment Continuous and Emergency Ratings

The existing equipment ratings for the 66kV upstream supply network to Mitchell Line 132kV STS are shown in table 4.

		SUMMER		WINTER		
FEEDER		AMPS	MVA	AMPS	MVA	LIMIT
Mitchell Line 132/66kV Transformer 1	Normal	1213	139	1309	141	ODAF Limit
	Emergency	1236	141	1309	141	ODAF Limit
Mitchell Line 132/66kV Transformer 2	Normal	1213	139	1309	141	ODAF Limit
	Emergency	1236	152	1309	141	ODAF Limit
66kV Feeder 6027 (Mitchell Line STS to Demnan ZS)	Normal	565	64.6	634	72.5	85°C Conductor
	Emergency	565	64.6	634	72.5	85°C Conductor
66kV Feeder 6025 (Mitchell Line STS to Demnan ZS)	Normal	565	64.6	634	72.5	85°C Conductor
	Emergency	565	64.6	634	72.5	85°C Conductor

Table 4 – Upstream 66kV Supply Network Equipment Continuous and Emergency Ratings

A High Voltage Connection (HVC) will be required on the tee connection to Hunter River Solar Farm. A new 66kV switching station including Ausgrid approved 66kV primary equipment including circuit breakers (CBs), current transformers (CTs) and voltage transformers (VTs) will be required for this HVC.

A tee connection to 66kV feeder 6027 to connect the Hunter River 60MW Solar Farm is shown in figure 3 below. The new feeder connection to 66kV feeder 6027 will be required to meet a summer rating of 65MVA for maximum generation output. To meet this requirement the 66kV feeder could be constructed with Pluto AAC conductor at a design temperature of 85°C.

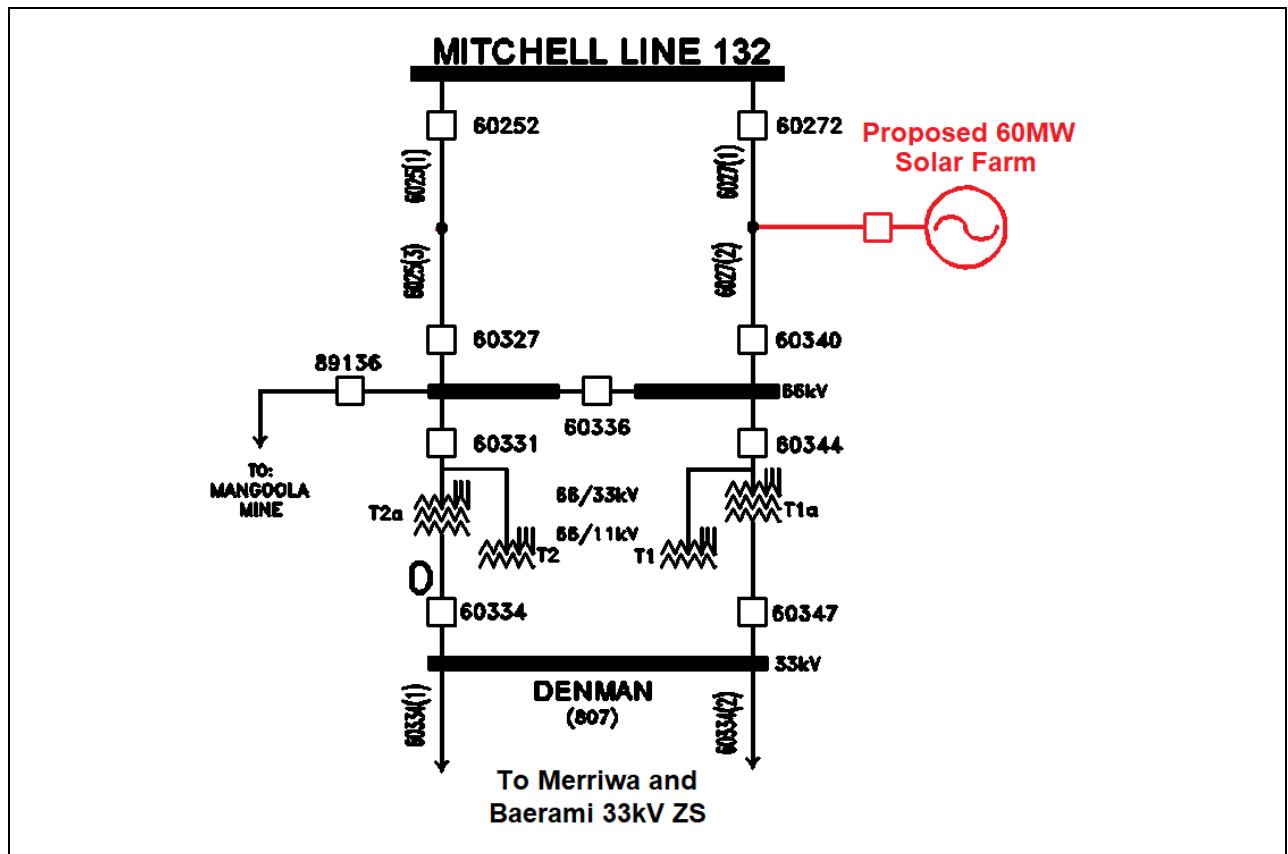


Figure 3 – Hunter River 60MW Solar Farm Connection

A connection method for Hunter River 60MW Solar Farm as shown in figure 3 provides an N security connection with no redundancy. Any planned or unplanned outage scenario on 66kV feeder 6027 will disconnect Hunter River 60MW Solar Farm until 66kV feeder 6027 is restored.

General Requirements

Voltage control of output of Hunter River 60MW Solar Farm is required. The voltage at the point of connection shall be to a fixed setpoint or via voltage droop. The output of Hunter River 60MW Solar Farm shall not degrade performance of the existing voltage control schemes in the local subsystem.

The details of the magnitude and method of voltage control need to be determined during detailed studies and outlined in the generator performance standards. As highlighted in the System Planning Review, an allowance has been made for new 33kV voltage transformers at Denman ZS. The outcome of the detailed studies will determine if the voltage transformers are required.

The Mitchell Line 66kV network is non effectively earthed via 200Ω resistor at Mitchell Line 132kV STS. Thus the maximum earth fault current that can flow under a fault is approximately 190A. To nullify the generator zero sequence infeed, a delta connected winding is proposed for the 66kV primary of the step up transformer.

NER Schedule 5.4B - Part D:

S5.4B(d) details of the level and standard of service of power transfer capability that the Distribution Network Service Provider, with reasonable endeavours, considers the network provides at the location of the connection point or connection points, if options have been made available under clause S5.4A(n);

By definition, power transfer capability; The maximum permitted power transfer through a transmission or distribution network or part thereof.

The power transfer capability has been assessed assuming summer line ratings and system normal and the worst case abnormal condition and minimum network loadings.

The power transfer capability assessment assumes a maximum active power of 60MW.

The reactive power capability is also assumed to meet the automatic access standard of 0.395 times the maximum active power.

Power Transfer Capability – Maximum Active Power – 60MW

Under system normal network conditions no network thermal limits are expected to be exceeded at the maximum active power generation of 60MW.

Under the worst case system abnormal network condition being 66kV feeder 6025 out of service, no network thermal limits are expected to be exceeded at the maximum active power generation of 60MW. Maximum utilisation is upstream of the point of connection to Mitchell Line 132kV STS on 66kV feeder 6027 at 90%.

Considering the assumed inverter reactive capability of $\pm 23.7\text{MVar}$ the permissible voltage control range, assuming a fixed voltage setpoint, at the point of connection is shown in table 6 below.

ACTIVE POWER	REACTIVE POWER	VPOC
60MW	23.7MVar	1.054pu
60MW	-23.7MVar	1.009pu

Table 6 – 60MW Active Power Dispatch Point of Connection Voltage Control Range

The maximum bucking tap position at both Denman 66kV ZS is at 1.0625pu. 11kV voltage regulation at Denman will be lost if the 66kV voltage exceeds this value.

Considering the steady state voltage requirements for the local network area, it is likely at a 60MW dispatch the solar farm will need to absorb reactive power to clamp system voltages.

NER Schedule 5.4B - Part E:

S5.4B(e) negotiated access standards that will require AEMO's involvement in accordance with clause 5.3.4A(c);

In accordance with the requirements of S5.2.5 and Table 2 listed above.

NER Schedule 5.4B - Part E1:

S5.4(e1) written details of:

- (1) the minimum three phase fault level at the connection point; and*
- (2) the results of the Network Service Provider's preliminary assessment of the impact of the new connection undertaken in accordance with the system strength impact assessment guidelines and clause 5.3.4B;*

In accordance with AEMO's system strength assessment guidelines;

Minimum Three Phase Fault Level

The existing minimum three phase fault level at the point of connection is shown in table 7.

	FAULT LEVEL		SOURCE IMPEDANCE		
Location	3Φ (A)	SLG (A)	Z Pos (Ω)	Z Neg (Ω)	Z Zero (Ω)
Point of Connection	3864.3	188	1.496 + j9.747	1.496 + j9.747	603.8 + j10.516

Table 7 – Minimum Three Phase Fault Levels at the Point of Connection

Impact on System Strength

As there are no other committed generation sources in the local network at the time of the connection application, using the assumed minimum short circuit ratio of 3.3 for the solar farm and the maximum generation of 60MW, there is approximately 200MVA of available fault level remaining at the solar farm point of connection. Therefore no adverse system strength impact has been identified.

NER Schedule 5.4B - Part F:

S5.4B(f) a list of the technical data to be included with the application to connect, which may vary depending on the connection requirements and the type, rating and location of the facility to be connected. The list provided under this paragraph (f) will generally be in the nature of the information set out in schedule 5.5 but may be varied by the Distribution Network Service Provider as appropriate to suit the size and complexity of the proposed facility to be connected;

The following outlines the information required for the construction and application of the Ausgrid power flow model from the Mitchell Line 66kV subsystem to the OPDMS boundary at Mitchell Line 132kV STS.

The loading scenarios have been derived by considering the minimum and maximum summer loading on the Denman 66kV subsystem supplied from Mitchell Line 132kV STS. Table 8 details the summer high and low timestamps.

LOADING SCENARIO	TIMESTAMP
SUMMER HIGH	1 st December 2020 18:30 hrs
SUMMER LOW	3 rd November 2020 13:00 hrs

Table 8 – Summer High and Low Timestamps

The timestamps provided in table 8 above is recommended for obtaining the OPDMS snapshots covering both high and low load scenarios.

The following model files are required for the construction of the power flow model as described above for summer high and low loading scenarios.

Ausgrid Network – Mitchell Line 132kV STS 66kV Subsystem

Table 9 details the model files required to construct the Mitchell Line 132kV STS 66kV Subsystem.

MITCHELL LINE 132KV STS 66KV SUBSYSTEM SUMMER HIGH AND LOW MODEL FILES
MITCHELL LINE 66KV – SUMMER HIGH.py
MITCHELL LINE 66KV – SUMMER LOW.py
MITCHELL LINE 66KV NETWORK – RAW.py
MITCHELL LINE 66KV NETWORK – SEQ.py
REMOVE MITCHELL LINE STS OPDMS LOADS.py
AUSGRID NETWORK.sld (PSSe version 34.2 construct)

Table 9– Ausgrid Network Summer High and Low Model Files

MITCHELL LINE 66KV – SUMMER HIGH.py and MITCHELL LINE 66KV – SUMMER LOW.py contain the loading magnitudes in MW and MVar for each major load point in the Mitchell Line 66kV network.

MITCHELL LINE 66KV NETWORK – RAW.py and MITCHELL LINE 66KV NETWORK – SEQ.py contain the model connectivity data in the positive and zero sequence for the Mitchell Line 66kV network.

REMOVE MITCHELL LINE STS OPDMS LOADS.py removes the aggregated loads on the Mitchell Line 132kV STS bus native to the OPDMS snapshot. These loads are not required once the Mitchell Line 66kV network and loads are added.

AUSGRID NETWORK.sld can be used to view the Mitchell Line 66kV subsystem within PSSe. This .sld file has been created in PSSe version 34.2.

In the MITCHELL LINE 66KV NETWORK – RAW.py, MITCHELL LINE 66KV NETWORK – SEQ.py and REMOVE MITCHELL LINE STS OPDMS LOADS.py contains a variable which sets the Mitchell Line 132kV bus number to align with the OPDMS snapshot being used. This needs to be set accordingly in these three .py files prior to running of the script and is shown below in figure 4.

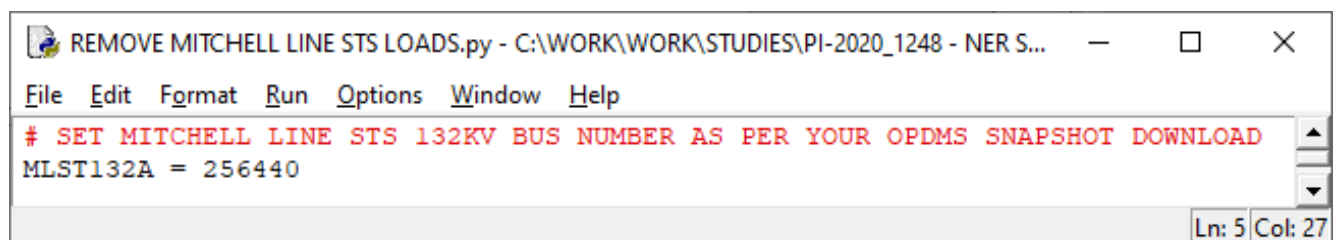


Figure 4 – Mitchell Line 132kV bus variable to be set

Model Construction

The intent of the model files provided is to construct the power flow model in PSSe version 34 enabling steady state analysis and the initialisation of this model to perform dynamic simulations.

The power flow model for the summer high and low scenario containing the OPDMS snapshot and the Ausgrid Mitchell Line 66kV distribution network may be constructed as follows.

1. Load desired Summer High / Low OPDMS case file snapshot into PSSe.
2. Run REMOVE MITCHELL LINE STS OPDMS LOADS.py

3. Run MITCHELL LINE 66KV NETWORK – RAW.py
4. Run MITCHELL LINE 66KV NETWORK – SEQ.py
5. Run desired MITCHELL LINE 66KV – SUMMER HIGH.py or MITCHELL LINE 66KV – SUMMER LOW.py

At this point the power flow model should contain the OPDMS network as well as the Mitchell Line 66kV network including snapshot loads. An initial load flow (Fixed Decoupled Newton Raphson) can be performed to initialise the power flow model to perform steady state analysis and initialise the model for dynamic simulations.

To verify success of the model build, the AUSGRID NETWORK.sld can be used view the build from within PSSe.

Model Application

With reference to the Ausgrid distribution network, the following should be noted.

Line and Transformer Ratings

The equipment summer ratings methodology should be applied if performing studies assessing steady state equipment utilisation.

1. The “NORM” (RATEA) rating denotes the system normal rating to be applied. This is the case for all overhead lines, underground cables or transformers.
2. The “EMER” (RATEB) rating denotes the system abnormal rating to be applied. This would be for the loss of at least a single network element (N-1). This is the case for all overhead lines, underground cables or transformers.

Mitchell Line 66kV Subsystem Transformer Voltage Regulation

Currently the voltage regulation scheme on the 66kV bus at Mitchell Line 132kV STS is set to a line drop compensation profile. The parameters of the line drop compensation profile are shown in table 10 below.

No Load Voltage	Full Load Voltage	Full Load Current
66.0kV (1.0pu)	67.3kV (1.019pu)	787A (90.0MVA)

Table 10 – Mitchell Line 132kV STS 66kV Voltage Regulation Profile

Care should be taken to set the $V_{\max}$ and $V_{\min}$ parameters of the 132/66kV transformers to achieve the correct 66kV voltage set point at Mitchell Line 132kV STS depending on the load and generation profile being simulated. In saying this, as the transformer tap step is 1.25% and the entire line drop compensation profile spans a voltage of approximately 2%, the changing of the $V_{\max}$ and $V_{\min}$ parameters may not result in new tap positions being found in the load flow solution.

It also should be noted that to facilitate this Solar Farm, it is likely that the line drop compensation regulation scheme will be disabled and the 66kV bus voltage will be regulated to a fixed voltage set point. The detailed studies to be performed here will determine the required voltage regulation scheme and voltage set point if required.

All 11kV voltage regulation schemes on the 66/11kV transformers at Aberdeen 66kV ZS, Scone 66kV ZS, Denman 66kV ZS, Mitchell Line 66kV ZS, Merriwa 33kV ZS and Baerami 33kV ZS have been set as required within the PSSe model.

11kV Shunt Capacitors

The 11kV shunt capacitors at Baerami 33kV ZS, Merriwa 33kV ZS and Scone 66kV ZS have been set with the B_{init} parameter to zero within the PSSe model. The shunt capacitor step size has been set in the Block 1 B_{step} parameter and the number of steps has been set in the Block 1 steps parameter.

For completeness the B_{init} value for each shunt capacitor should be set to the maximum number of steps in to maintain the largest permissible lagging power factor at the zone substations.

NER Schedule 5.4B - Part G:

S5.4B(g) commercial information to be supplied by the Connection Applicant to allow a Network Service Provider (as is relevant) to make an assessment of the ability of the Connection Applicant to satisfy the prudential requirements set out in rules 6.21 and 6A.28;

Ausgrid is operating as a DNSP in this arrangement and as such, only clause 6.21 applies. In this regard, Ausgrid will require the provision of the name and ABN of the operating entity in relation to the facility.

Ausgrid's policy is to provide fees and requires upfront payments to proceed. Therefore, no further warranties are required, however, where the estimated fees are incorrect, Ausgrid reserves the right to pause works until appropriate costs are recovered. In addition, if it is deemed necessary, satisfactory security may be sought in accordance with Ausgrid's payment terms.

NER Schedule 5.4B - Part H:

S5.4B(h) so far as is relevant, and in relation to services that the Distribution Network Service Provider intends to provide, an itemised estimate of connection costs including:

(1) connection services charges;

See table 11 in NER Schedule 5.4B - Part M of this response.

(2) costs associated with the proposed metering requirements for the connection;

The associated costs with any metering changes to achieve compliance with the requirements and of the National Electricity Rules, ES1 and ES3 will need to be obtained by you metering service provider.

(3) costs of any network extension;

Ausgrid has provided information on the necessary upgrades in the NER Schedule 5.4A - Part A and NER Schedule 5.4B - Part C section of this response. An estimate of the costs associated with these upgrades/augmentations to facilitate this connection has previously been provided in the Connection Options Study (System Planning Advice) of 13 October 2020. Modifications to SCADA equipment at Mitchell Line STS and Denman ZS may be required and the associated costs to do so will be provided at application for connection stage.

With regards to any customer funded 66kV HVC substation, Ausgrid has approved suitable primary equipment including circuit breakers (CBs) and voltage transformers (VTs).

(4) details of augmentation required to provide the connection and associated costs;

Refer to point 3.

(5) details of the interface equipment required to provide the connection and associated costs;

As detailed in NER Schedule 5.4A - Part A and NER Schedule 5.4B - Part C section of this response, the proposed connection arrangement is a connection via a High Voltage Connection (HVC) as shown in figure 3. The design and construction of this switching station is to be fully funded by the customer under the contestable process.

(6) details of any ongoing operation and maintenance costs and charges to be undertaken by the Distribution Network Service Provider; and

Subject to the comments made in NER Schedule 5.4B - Part G of this document, these fees are intended to be negotiated with the development of the Generator Connection Agreement, however they will be calculated based on cost reflective principles related to the operation and maintenance of the connection assets and consistent with values charged under ancillary network services. For the purposes of consistency Ausgrid proposes to use its connection policy for ancillary network services charges for NECF (Chapter 5A) for customer-initiated network access charges. These rates have been negotiated with the AER and are adjusted on a CPI basis. The link to the 2019-2024 regulatory period valid policy and associated regulator agreement can be found below:

<https://www.ausgrid.com.au/-/media/Documents/Regulation/Pricing/PList/Appendix-B-Alternative-control-services-fee-schedule-2020-21.pdf?la=en&hash=BE6ADA9DD3A5A55742974A1C2DF26D8B4676A039>

(7) other incidental costs and their basis of calculation;

Ausgrid has endeavoured to include all required costs associated with the connection. Should additional costs arise, they will be charged at the appropriate rates as per ancillary network service fees/framework

NER Schedule 5.4B - Part I:

S5.4B(i) an explanation of the factors affecting each component of the itemised estimate of connection costs and the further information that will be taken into account by the Distribution Network Service Provider in preparing the final itemised statement of connection costs to be provided under clause 5.3.6(b2)(1);

Please refer to the detail provided in the response to NER Schedule 5.4B - Part H of this document to address these requirements.

NER Schedule 5.4B - Part J

S5.4B(j) using reasonable endeavours, all risks and obligations in respect of the proposed connection associated with planning and environmental laws not contained in the Rules;

Ausgrid has no reason to suggest any changes would be required.

NER Schedule 5.4B - Part K

S5.4B(k) a draft connection agreement that contains the proposed terms and conditions for connection to the network including those of the kind set out in schedule 5.6 and:

- (1) an explanation of the terms and conditions in the connection agreement that need to be finalised; and*
- (2) if relevant, further information necessary from the Connection Applicant to finalise the connection agreement;*

Please refer to the information pack and website links provided for further details on the proposed terms and conditions for connection and a draft connection agreement.

<https://www.ausgrid.com.au/Connections/solar-battery-and-embedded-generation/Connecting-larger-embedded-generators>

See attached the draft negotiated ASP1 connection agreement along with the Negotiated ongoing connection contract Embedded Generators.

NER Schedule 5.4B - Part L

S5.4B(l) a description of the process for lodging the application to connect, including:

- (1) the options open to the Connection Applicant in submitting an application to connect in accordance with clause 5.3A.9;*

Please refer to the information pack and website links provided for further details of the timetables applicable to your connection enquiry available at:

<https://www.ausgrid.com.au/Connections/solar-battery-and-embedded-generation/Connecting-larger-embedded-generators>

- (2) the further analysis to be undertaken by the Distribution Network Service Provider as part of the Distribution Network Service Provider's assessment of the application to connect;*

Please refer to the description of requirements in NER Schedule 5.4B - Part F in this document. It is anticipated that once this modelling work is submitted Ausgrid will perform a review of the submission and consult on any additional information prior to approaching Transgrid and AEMO for their respective comments and endorsement. This review will include some verification of the modelling files and protection settings.

- (3) further information required from the Connection Applicant for the Distribution Network Service Provider to assess the application to connect; and*

Please refer to the description of requirements in NER Schedule 5.4B - Part F in this document. It is anticipated that once this modelling work is submitted Ausgrid will perform a review of the submission and consult on any additional information prior to approaching Transgrid and AEMO for their respective comments and endorsement. This review will include some verification of the modelling files and protection settings.

(4) an outline of proposed milestones (and their timeframes) for connection and access activities which may be modified from time to time by agreement of the parties, where such agreement must not be unreasonably withheld;

Please refer to the information pack provided for further details of the timetables applicable to your connection enquiry available at:

<https://www.ausgrid.com.au/Connections/solar-battery-and-embedded-generation/Connecting-larger-embedded-generators>

NER Schedule 5.4B - Part M

S5.4B(m) the application fee payable when submitting an application to connect;

The fees payable on application are detailed below. These fees are required to cover the reasonable costs of undertaking the assessments associated with the development of the detailed enquiry response and the subsequent offer to connect. These fees are not inclusive of Transgrid's costs to assess the impact of the Application for Connection. In the case where negotiated access standards are proposed or changed then additional fees may be applicable to cover the costs of further assessments as required by Ausgrid and/or AEMO.

The fee estimate associated with the preparation of an Offer to Connect is shown in the table below. These fees are required to be paid on submission of an Application for Connection prior to the commencement of an Offer to Connect.

Table 11: Applicable Fees for Offer to Connect

Item	Description	Hours	Amount (GST Inc.)
1	Coordinating, processing and assessing the connection application	60	\$14,621.64
2	Review of the submitted dynamic and steady analysis	160	\$38,991.04
3	Review of the protection fault and discrimination analysis	90	\$21,932.46
4	Development of the draft offer to connect and agreements	16	\$3,899.10
5	Development of any applicable design information packages	60	\$14,621.64
	Total	386	\$94,065.88

Please note that in accordance with the National Electricity Rules and Ausgrid's need to recover its costs, Ausgrid will monitor the costs associated with the provision of these services and any adjustments will be made at the offer to connect for this proposal.

Please note the validity of information contained in this response may diminish over time. Where necessary Ausgrid may require BayWa r.e. Projects Australia to submit a new connection enquiry should related information change significantly prior to development and completion of a detailed Application for Connection.

NER Schedule 5.4B - Part N

S5.4B(n) whether the Distribution Network Service Provider agrees to the detailed response remaining valid for a specified period of time to allow the Connection Applicant to lodge an application to connect within that time; and

Ausgrid acknowledges that it can take some time to develop the detailed information required to proceed with these sorts of developments. This is more relevant where contestable works are required to augment the network. With consideration of the level of activity in large scale embedded generation enquiries and consistent with our position on contestable works, it is considered that a validity period of 12 months should be suitable, with the opportunity to extend this time period, at Ausgrid's discretion, with a suitable review network states and changes to Ausgrid policy and regulatory frameworks.

NER Schedule 5.4B - Part O

S5.4B(o) any additional information relevant to the application to connect.

A range of information will be required to enable an assessment of an application for connection as described below:

1. General requirements – confirmation of general contact details for proponent as well as geographic information relating to the proposed facility and connections.
2. Technical requirements – information relating to compliance with the technical requirements described above (Specifically information requested in Schedule 5.4A Part O) and details of proposed negotiated access standards where applicable (refer NER clause 5.3.4(e)).
3. Confirmation of generation capacity and power transfer requirements – Total station net maximum capacity (NMC). Number, size and type of generators. Anticipated apparent, active and reactive power output duration curve and applicable operational aspects/constraints. Details of proposed power transfer capacity of the connection to the network including maximum and minimum requirements.
4. Confirmation of connection arrangements – details of proposed connection from the facility to the Ausgrid network, including type, route, length and impedances for the proposed connecting assets.
5. Confirmation of the Single line diagram of the main high voltage arrangement - including busbar arrangements, substation arrangements, tap-changer details, phasing arrangements, earthing arrangements, switching facilities, operating voltages as well as any proposed high voltage reactors or capacitors and associated switching details.
6. Protection arrangements – details of proposed protection arrangements for the generators, facility and connection including anticipated fault clearing times and proposed backup arrangements for breaker-fail. Proposed arrangement for the Islanding/synchronisation checking protection proposal and associated DC supply systems.
7. Load characteristics for the facility when not generating (refer NER schedule 5.5.5).
8. Technical Data –Standard Planning Data details as described in AEMO Generating Design Data Sheets and Generating System Setting Data Sheets (refer AEMO website).

As detailed in NER schedule 5.2.4, further technical data can be provided by Ausgrid upon request, to assist in the development of necessary technical requirements, access standards and an application for connection, including:

1. Applicable fault level information.
2. Clearing times for existing protection systems.
3. Expected power quality allocation limits with and without generator connected.
4. Single line diagrams, source impedances and a model of the power system including proposed projects and range of operating conditions to allow necessary static and dynamic analysis.

Preliminary Connection Program

Please refer to the information pack provided for further details of the timetables applicable to your connection enquiry available at:

<https://www.ausgrid.com.au/Connections/solar-battery-and-embedded-generation/Connecting-larger-embedded-generators>

Access Standards Requirements

To assist in understanding Ausgrid's intentions for the Detailed Response, Information regarding automatic and minimum access standards for each technical requirement relevant to the proposed facility is provided in Table 2 above.

Where automatic access standards are not achievable, further technical investigations will need to be undertaken to determine an acceptable negotiated access standard. In many cases AEMO may be required to advise on matters related to the development of negotiated access standards as indicated in Table 2. In cases where it is proposed to adopt a negotiated access standard, applicable details should be submitted with the application for connection.

In the case where one or more minimum access standards are not achievable then it is unlikely the proposed connection to the Ausgrid network will be possible and alternative arrangements for the plant and network connection may need to be considered.

In respect of voltage fluctuations and harmonic distortion, it should be noted that where an agreed negotiated access standard is reached, it may be necessary in the future to negotiate the movement to an automatic access standard in accordance with the NER S5.1.5(c) and NER 5.1.6(c).

Next Steps

After reviewing the above information, it may be advisable to arrange a meeting with Ausgrid to discuss this response and address any immediate concerns. If BayWa r.e. Projects Australia wishes to proceed with the proposal payment of the offer to connect fees should be paid as described above and in accordance with clause 5.3A.9 of the National Electricity Rules. To pay these fees please accept the proposed offer within Ausgrid's Customer Portal.

I look forward to hearing from you in the future and please do not hesitate to contact me if any further assistance or information is required.

Yours sincerely,



Douglas Giles

Customer Manager – Energy Transformation

Attachments:

Ausgrid Model Data.zip

Hunter River 60MW Solar Farm Power Quality Emissions Report.pdf

Hunter River Solar Farm Fault Clearing Times.pdf

Negotiated Offer - Connection Services for Contestable ASP1 Connections _Dec 2016.pdf

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OPEN CUT**
GLENORE

**Public Notice
Road Closures Due to
Blasting Activities - Wybong Road**

Mangoola Coal Operations wish to advise that Wybong Road closures due to blasting activities may take place between:

**Monday 18th October 2021 ~
Friday 22nd October 2021**

The road will be closed between west of the mine entrance road for up to 3kms west along Wybong Road. The road closure will occur between 10am and 2pm and be closed for 15 minutes but most likely between ~12:00pm and ~12:30pm. These times are subject to change depending on environmental conditions. Roadside signs will display the date and approximate time of each closure.

For further information, please contact our Blasting and Community Response Hotline:
1800 014 339

13/10/2021 - Public Notices

Solar Farm Development

BayWa r.e. would like to inform the Muswellbrook, Denman and Upper Hunter community of the proposed 84 MWp DC / 60 MW AC Hunter River Solar Farm. This solar farm is to be located approximately 13 km south-west of Muswellbrook on 1619 Denman Road. More information is available on the project website: www.hunterriversolarfarm.com.au

We welcome any feedback on this proposed project and this can be provided either through the project website or by emailing info@baywa-re.com.au

 **BayWa r.e.**

13/10/2021 - Public Notices


Chamberlains.

**WITNESSES SOUGHT –
MERRIWA CENTRAL SCHOOL**

Chamberlains Law Firm are looking for witnesses, former teachers and students of Merriwa Central School during the 1970's – 1980's who can offer any assistance or information in relation to allegations of sexual and/or physical abuse of students.

If you can be of any assistance or have any information, please contact Jon May or Alison McNamara on (02) 6188 3600 or via email to: jon.may@chamberlains.com.au or alison.mcnamara@chamberlains.com.au

13/10/2021 - Public Notices

Mt Owen Complex

COMMUNITY RESPONSE LINE

If you have any environmental
concerns or inquiries in relation
to Mt Owen Complex please
contact the Mine on the
freecall number:

1800 730 883

BLASTING INFORMATION LINE

For information on blasting times
please contact

Mt Owen Glendell Operation's on the
numbers listed:

Mt Owen Blasting Thiess Hotline
(02) 6570 0800

AV288769

THIESS

Glendell Blasting
1800 319 566

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www.mtowencomplex.com.au

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We welcome any feedback on this proposed project and this can be provided either through the project website or by emailing info@baywa-re.com.au



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Hi ~~David~~

The solar farm will therefore be near property owned by you and Marsha Shibble, i.e.: Lot 23 & Lot 24 DP 235356 (owned by Cooltah Holdings Pty Ltd) and Lot 3 DP 215827 (owned by David Colin George Shibble and Marsha Sally Shibble).

We are currently preparing the Development Application for the solar farm and are planning to submit the preliminary environmental assessment to the Department of Planning, Industry and Environment sometime this year. The attached letter contains more information about the development and the approval process.

Please feel free to contact me if you or Marsha Shibbole have any questions about the project.

We are also trying to contact your neighbours ~~Jackie MacPherson and Raymond Wilks~~. You mentioned that you had a contact number for ~~Jackie~~ and may also be able to provide one for ~~Raymond~~? Would be able to send me the contact numbers that you have?

Best regards

Thomas Parel
Project Manager



BayWa r.e. Projects Australia Pty Ltd
Level 1, 79-81 Coppin Street
Richmond Victoria 3121

M +61 418 467 167
Thomas.Parel@baywa-re.com
www.baywa-re.com.au

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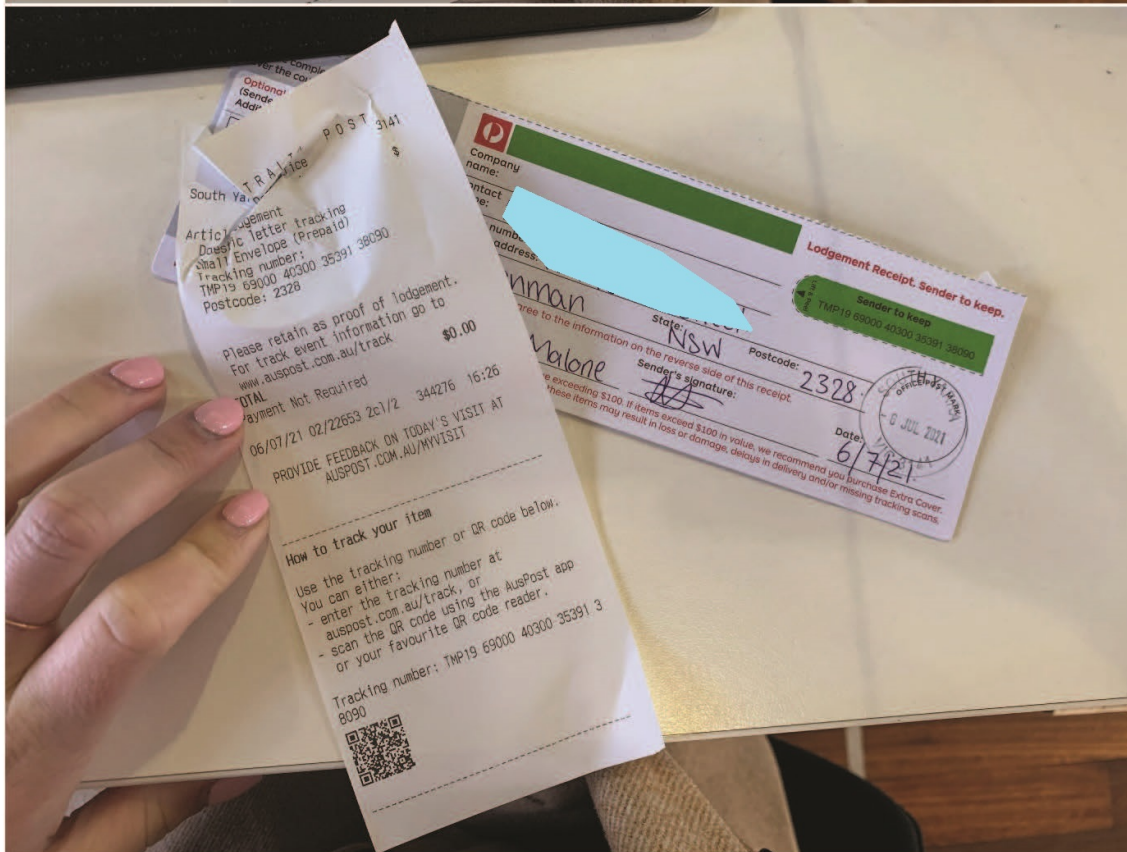
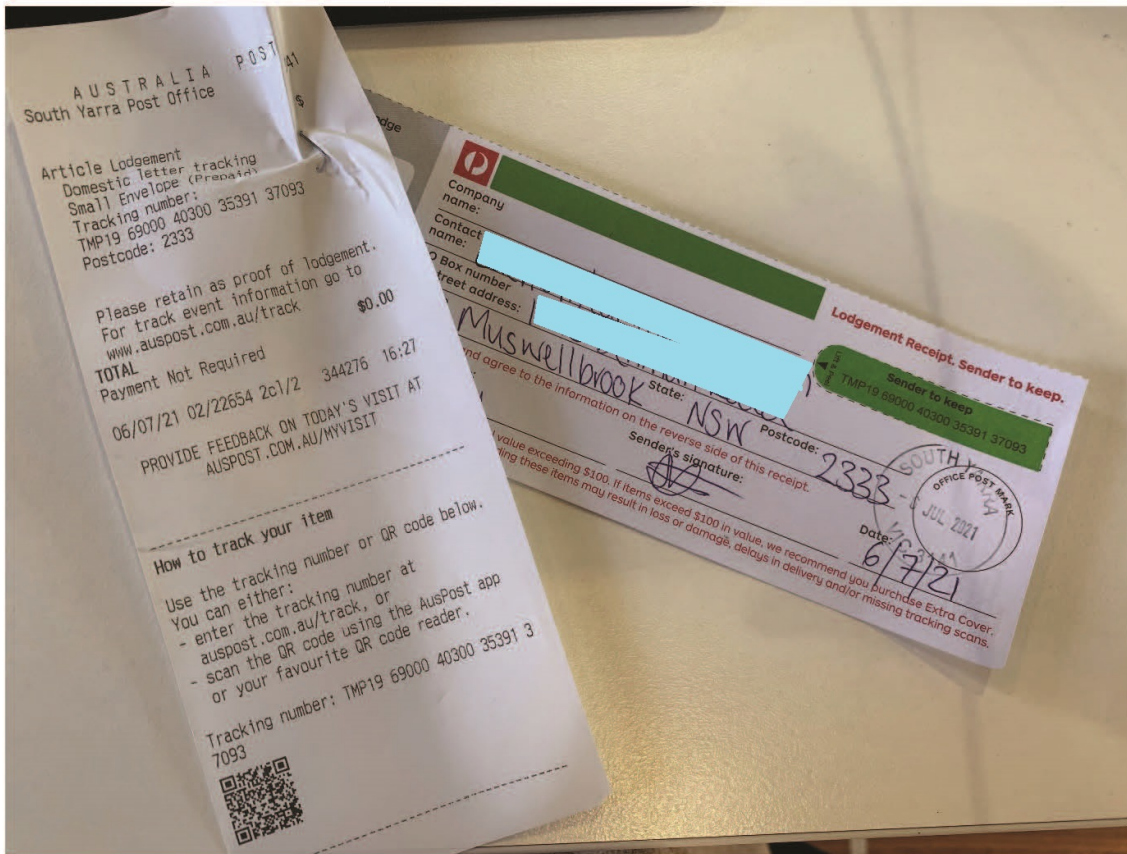
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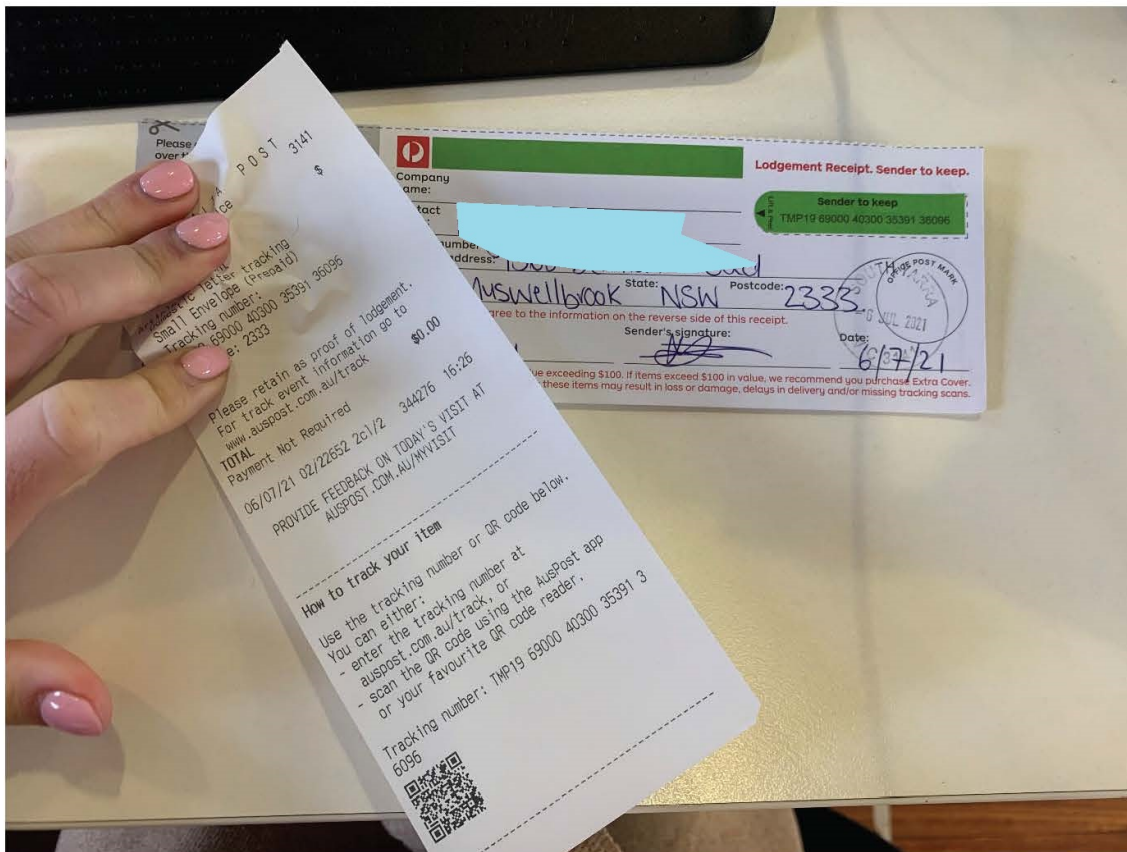
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Appendix D Social assessment scoping worksheet

	Social Impact Assessment (SIA) Worksheet										Project name: Hunter River Solar Farm										Date: 28 October 2021									
PROJECT ACTIVITIES	CATEGORIES OF SOCIAL IMPACTS	POTENTIAL IMPACTS ON PEOPLE		PREVIOUS INVESTIGATION OF IMPACT		CUMULATIVE IMPACTS			ELEMENTS OF IMPACTS - Based on preliminary investigation					ASSESSMENT LEVEL FOR EACH IMPACT				PROJECT REFINEMENT		MITIGATION / ENHANCEMENT MEASURES										
Which project activity / activities could produce social impacts ?	what social impact categories could be affected by the project activities	What impacts are likely, and what concerns/aspirations have people expressed about the impact? Summarise how each relevant stakeholder group might experience the impact. NB. Where there are multiple stakeholder groups affected differently by an impact, or more than one impact from the activity, please add an additional row.		Has this impact previously been investigated (on this or other project/s)?	If "yes - this project," briefly describe the previous investigation. If "yes - other project," identify the other project and investigation	Will this impact combine with others from this project (think about when and where), and/or with impacts from other projects (cumulative)?	If yes, identify which other impacts and/or projects	Will the project activity (without mitigation or enhancement) cause a material social impact in terms of its: You can also consider the various magnitudes of these characteristics					Level of assessment for each social impact	What methods and data sources will be used to investigate this impact?			Has the project been refined in response to preliminary impact evaluation or stakeholder feedback?	What mitigation / enhancement measures are being considered?												
			Is the impact expected to be positive or negative					extent (i.e. number of people potentially affected)?	duration or expected impacts? (i.e. construction vs	intensity or expected impacts (i.e. scale or degree	sensitivity or vulnerability of people potentially	level of concern/interest of people potentially		Secondary data	Primary Data - Consultation	Primary Data - Research														
Pre-construction (Project conception, assessment and engagement)	community	Proposed development projects can be grounds for contestation within local communities, which can negatively impact on community cohesion .	Negative	Unknown	n/a	Yes	A larger number of major projects in the Muswellbrook LGA are in the planning and development phase; many relate to Coal, including works for the nearby Bayswater and Liddell Power Stations. Many of these may already affect, and are likely to continue affecting, community cohesion in the local area.	No	Unknown	Unknown	Yes	Yes	Minor assessment of the impact	Required	Broad consultation	Targeted research	No	Robust community and stakeholder engagement being delivered as per the Hunter River Community and Stakeholder Engagement Strategy Recommend that the proponent develop a Community Benefits/Contributions Fund, in consultation with a diverse range of key local stakeholders												
	health and wellbeing	Development projects can create stress and anxiety in people who may oppose the project and/or be directly impacted and/or through face uncertainty around project progression and potential real or perceived impacts. There is no evidence so far that this is the case, but it has been observed/experienced in other renewable energy projects.	Negative	Unknown	n/a	Yes	As above. Also, in context of broader uncertainties related to energy transitions and the potential implications this has for the jobs and job security in the Muswellbrook LGA.	no	no	Unknown	unknown	unknown	Minor assessment of the impact	Required	Limited - if required (e.g. local council)	Not required	No	Robust community and stakeholder engagement being delivered as per the Hunter River Community and Stakeholder Engagement Strategy Recommend that the proponent develop a Community Benefits/Contributions Fund, in consultation with a diverse range of key local stakeholders												
	decision-making systems	Procedural fairness. Real or perceived lack of inclusion in the planning, assessment and consultation process. Translates into real or perceived inability to make informed decisions, and/or inability to influence project decisions, including elements of project design.	Negative	Unknown	n/a	Yes	As above. Also, in context of broader uncertainties related to energy transitions and the potential implications this has for the jobs and job security in the Muswellbrook LGA.	Unknown	Unknown	Unknown	Unknown	unknown	Minor assessment of the impact	Required	Broad consultation	Targeted research	No	Robust community and stakeholder engagement being delivered as per the Hunter River Community and Stakeholder Engagement Strategy Recommend that the proponent develop a Community Benefits/Contributions Fund, in consultation with a diverse range of key local stakeholders. Early, proactive and sustained engagement/consultation recommended. Project and engagement material provided in a variety of mediums. Variety of mechanisms for engagement opportunities/activities.												
Construction - demand for labour, goods and services	Livelihoods	An increase in economic activity within the local and regional areas is expected. The project will directly and indirectly (through its supply chains) create demand for goods and services such as accommodation, construction materials, freight and local labour. The increased income and spending of the construction workers and others across the supply chains, will also add to the stimulation of the local economies more broadly. SEARS also state the need to define benefits of the project for the region and the State as a whole.	Positive	yes - other project	unknown	Yes	A larger number of major projects in the Muswellbrook LGA are currently under construction and/or operational. Coal projects in particular drive a lot of local economic activity (directly and indirectly).	Yes	No	Yes	Yes	Yes	Detailed assessment of the impact	Required	Broad consultation	Targeted research	No	Robust community and stakeholder engagement being delivered as per the Hunter Rivers SF Community and Engagement Strategy. Recommend that the proponent develop strong and sustained partnerships with the key local stakeholders (e.g. Business Chamber, Council) Recommend that the proponent develop a local employment and labour strategy that focuses on enabling local and regional employment and contracting, as well as consideration of opportunities for young people, Aboriginal people, apprentices and trainees. It is recommended to do this in consultation with the key local economic development stakeholders.												
	livelihoods	Employment and labour impacts - During construction phase, the project will directly generate employment, with the peak construction workforce expected to be up to 200 during the peak period. This may include specific opportunities for local people, Aboriginal people, young people, apprentices and trainees. During construction, the project will also create employment and labour opportunities across its supply chains. During operations, the project is expected to employ 3 FTE workers. SEARS state the need to define benefits of the project for the region and the State as a whole.	Positive	yes - other project	unknown	Yes	A larger number of major projects in the Muswellbrook LGA are currently under construction and/or operational. Coal projects in particular drive a lot of local employment activity (directly and indirectly).	Yes	No	Yes	Yes	Yes	Detailed assessment of the impact	Required	Broad consultation	Targeted research	No	Robust community and stakeholder engagement being delivered as per the Hunter Rivers SF Community and Engagement Strategy. Recommend that the proponent develop strong and sustained partnerships with the key local stakeholders (e.g. Business Chamber, Council) Recommend that the proponent develop a local employment and labour strategy that focuses on enabling local and regional employment and contracting, as well as consideration of opportunities for young people, Aboriginal people, apprentices and trainees. It is recommended to do this in consultation with the key local economic development stakeholders.												
Construction - influx of construction workers	livelihoods	Even with the development of a local employment and labour strategy, it is expected that construction workers (including some specialist renewable energy construction workers) would come in from other areas to work on this project. These workers may be housed in temporary accommodation in nearby townships, and this may constrain the availability of accommodation for tourism .	Negative	Unknown	n/a	Yes	A larger number of major projects in the Muswellbrook LGA are currently under construction and/or operational.	No	No	No	No	Unknown	Standard assessment of the impact	Required	Consultation	Not required	No	Robust community and stakeholder engagement being delivered as per the Hunter Rivers SF Community and Engagement Strategy. Recommend that the proponent develop strong and sustained partnerships with the key local stakeholders (e.g. Business Chamber, Council) Recommend that the proponent develop a local employment and labour strategy that focuses on enabling local and regional employment and contracting, as well as consideration of opportunities for young people, Aboriginal people, apprentices and trainees. It is recommended to do this in consultation with the key local economic development stakeholders.												
	access	An influx of construction workers staying in nearby township may increase demand for local social and community infrastructure (e.g. health and community services).	Negative	Unknown	n/a	yes	A larger number of major projects in the Muswellbrook LGA are currently under construction and/or operational, and cumulative impacts may be expected.	Unknown	No	No	No	Unknown	Standard assessment of the impact	Required	Consultation	Not required	No	Robust community and stakeholder engagement being delivered as per the Hunter Rivers SF Community and Engagement Strategy. Recommend that the proponent develop strong and sustained partnerships with the key local stakeholders (e.g. Business Chamber, Council) Recommend that the proponent develop a local employment and labour strategy that focuses on enabling local and regional employment and contracting, as well as consideration of opportunities for young people, Aboriginal people, apprentices and trainees. It is recommended to do this in consultation with the key local economic development stakeholders. Recommend that the proponent develop a Community Benefits/Contributions Fund, in consultation with a diverse range of key local stakeholders.												
	community	An influx of construction workers into nearby townships may change the composition of local community, and so change the local and community feel of the town, during construction .	Negative	Unknown	n/a	Yes	A larger number of major projects in the Muswellbrook LGA are currently under construction and/or operational, and incur cumulative impacts on people's sense of place. In larger context of energy transitions and uncertainty in the Hunter Region.	Unknown	No	Unknown	Unknown	Unknown	Minor assessment of the impact	Required	Broad consultation	Targeted research	No	Robust community and stakeholder engagement being delivered as per the Hunter Rivers SF Community and Engagement Strategy. Recommend that the proponent develop strong and sustained partnerships with the key local stakeholders (e.g. Business Chamber, Council) Recommend that the proponent develop a local employment and labour strategy that focuses on enabling local and regional employment and contracting, as well as consideration of opportunities for young people, Aboriginal people, apprentices and trainees. It is recommended to do this in consultation with the key local economic development stakeholders. Recommend that the proponent develop a Community Benefits/Contributions Fund, in consultation with a diverse range of key local stakeholders.												
	way of life	During the construction period, there is the potential for adverse noise impacts for landowners/neighbours near to the Project site as well as along proposed haulage routes.	Negative	Unknown	n/a	Yes	A larger number of major projects in the Muswellbrook LGA are currently under construction and/or operational, and incur cumulative noise impacts from construction, haulage and operational activities, on peoples' way of life, including their ability to enjoy peace and quiet.	Unknown	Unknown	Unknown	Unknown	Unknown	Minor assessment of the impact	Noise impact assessments from nearby major projects, noise standards.	Consultation	Preparation of specialist noise impact assessment	No	As part of the development application a noise impact assessment for both the construction and operation phase will be undertaken. Construction hours (except in the case of an emergency) will generally be 7 am to 6 pm, Monday to Friday and 7 am to 1 pm on Saturdays. Therefore, there should not be any noise impact during the most sensitive hours i.e. night.												

PROJECT ACTIVITIES	CATEGORIES OF SOCIAL IMPACTS	POTENTIAL IMPACTS ON PEOPLE	PREVIOUS INVESTIGATION OF IMPACT			CUMULATIVE IMPACTS		ELEMENTS OF IMPACTS - Based on preliminary investigation					ASSESSMENT LEVEL FOR EACH IMPACT				PROJECT REFINEMENT	MITIGATION / ENHANCEMENT MEASURES	
Which project activity / activities could produce social impacts ?	what social impact categories could be affected by the project activities	What impacts are likely, and what concerns/aspirations have people expressed about the impact? Summarise how each relevant stakeholder group might experience the impact. NB. Where there are multiple stakeholder groups affected differently by an impact, or more than one impact from the activity, please add an additional row.	Is the impact expected to be positive or negative	Has this impact previously been investigated (on this or other project/s)?	If "yes - this project," briefly describe the previous investigation. If "yes - other project," identify the other project and investigation	Will this impact combine with others from this project (think about when and where), and/or with impacts from other projects (cumulative)?	If yes, identify which other impacts and/or projects	Will the project activity (without mitigation or enhancement) cause a material social impact in terms of its: You can also consider the various magnitudes of these characteristics					Level of assessment for each social impact	What methods and data sources will be used to investigate this impact?			Has the project been refined in response to preliminary impact evaluation or stakeholder feedback?	What mitigation / enhancement measures are being considered?	
		extent i.e. number of people potentially affected?						duration or expected impacts? (i.e. construction vs operational)	intensity or expected impacts i.e. scale or degree	sensitivity or vulnerability of people potentially affected?	level of concern/interest of people potentially affected?	Secondary data		Primary Data - Consultation	Primary Data - Research				
Construction - amenity	way of life	During the construction period, there is the potential for minor air quality impacts for landowners/neighbours near to the Project site as well as along proposed haulage routes due to ground disturbance and the movement of vehicles along unsealed tracks. Raised during initial consultation	Negative	Unknown	n/a	Yes	A larger number of major projects in the Muswelbrook LGA are currently under construction and/or operational, and incur cumulative air quality impacts from construction, haulage and operational activities.	Unknown	Unknown	Unknown	Unknown	Unknown	Minor assessment of the impact	Dust/air quality specialist assessments	Consultation	N/a	no	Dust suppression measures such as watering the site will be implemented on the solar farm site during construction to mitigate dust impacts	
	way of life	During the construction period, there is the potential for traffic impacts for users of Denman Road, including landowners/neighbours near to the Project site as well as along proposed haulage routes due to the movement of construction traffic and large haulage vehicles. Raised during initial consultation	Negative	Unknown	n/a	Yes	A larger number of major projects in the Muswelbrook LGA are currently under construction and/or operational, and incur cumulative traffic impacts from construction, haulage and operational activities.	Unknown	Unknown	Unknown	Unknown	Unknown	Minor assessment of the impact	Traffic impact assessments from nearby major projects; TfNSW traffic counts	Consultation	Preparation of specialist traffic impact assessment	no	As part of the development application a traffic impact assessment will be undertaken. The results of this may requires some road augmentation works such as intersection works at the solar farm entrance. The majority of traffic will be during construction and decommissioning. Operational traffic volumes will be low with only 3-4 vehicles each day.	
All project stages - Change in land use	Surroundings	This project will result in the loss of agricultural land (approx.110ha). Some community members have expressed concern about this in initial project engagement. The project will see a diversion of land use away from agricultural production, including BSAL during project construction and operations. However this land will be returned to agricultural use following decommissioning. There are also likely to be impacts relating to perceptions about the loss of agricultural land.	Negative	No	n/a	Yes	A larger number of major projects in the Muswelbrook LGA are currently under construction and/or operational, and incur cumulative land use changes from construction and operational activities.	Unknown	Unknown	Unknown	Unknown	Unknown	Standard assessment of the impact	Government/stakeholder agricultural data releases and reports	Consultation	Online survey	No	Robust community and stakeholder engagement being delivered as per the Hunter River Community and Stakeholder Enagement Strategy Recommend that the proponent develop a Community Benefits/Contributions Fund, in consultation with a diverse range of key local stakeholders. Project Site would be returned to its former state following decommissioning of the Solar Farm, allowing for continued agricultural production.	
All project stages - Change in land use	surroundings	During the construction and operational period, there is the potential for visual and landscape character impacts for landowners/neighbours near to the Project site as well as users of Denman Road. Raised during initial consultation	Negative	Unknown	n/a	Yes	A larger number of major projects in the Muswelbrook LGA are currently under construction and/or operational, and incur cumulative visual and landscape character changes from construction and operational activities. Occurs in context of broader landscape change in the Hunter region	Unknown	Unknown	Unknown	Unknown	Unknown	Standard assessment of the impact	Government/stakeholder agricultural data releases and reports; visual impact assessments from nearby major projects	Consultation	Online survey; specialist visual impact assessment report	No	Robust community and stakeholder engagement being delivered as per the Hunter River Community and Stakeholder Enagement Strategy Recommend that the proponent develop a Community Benefits/Contributions Fund, in consultation with a diverse range of key local stakeholders. Project Site would be returned to its former state following decommissioning of the Solar Farm.	
All project stages - potential change in property values	Livelihoods	Some renewable and development projects may have the potential to adversely impact on property values . There may also be perceptions of adverse impacts on property values also.	negative	Unknown	n/a	Unknown	unknown	No	yes	yes	yes	unknown	Standard assessment of the impact	Any available and relevant ex-post impact assessments	Consultation	n/a	No	TBD	
Operation - Community benefit	community	Project proponent offering \$5,000 subsidies for rooftop solar systems for landholders within 1km of the Project. Possibly perceived unequal distribution of benefits has the potential to affect social cohesion. Distributive fairness.	Positive	No	n/a	Unknown	There are a larger number of major energy projects in the local area. Many of these have developed and implemented community benefit strategies and funds of varying scale and extent. Considerable precedent and association community expectations. Distributive benefits are not always transparent.	Unknown	Unknown	Unknown	Unknown	Unknown	Standard assessment of the impact	N/A	Consultation	Online survey	No	Robust community and stakeholder engagement being delivered as per the Hunter River Community and Stakeholder Enagement Strategy Recommend that the proponent develop a Community Benefits/Contributions Fund, in consultation with a diverse range of key local stakeholders. Project Site would be returned to its former state following decommissioning of the Solar Farm.	

Appendix E Cumulative impact scoping summary

Future Projects	Approximate distance to Project	Project status/details	Potential impact overlaps
Denman Road Solar Farm	5km (400 Denman Road, Denman)	Determined (03/09/2021)	<u>Traffic</u> The Denman Road Solar farm is anticipated to take 24 weeks for construction (Bitzios Consulting, 2020). As the Project has been determined, it is expected that there would be no overlap of construction activities between the Denman Road Solar Farm and the Hunter River Solar Farm. It is anticipated that two fulltime employees would perform routine maintenance twice a month. As such, operational traffic from the Denman Road Solar Farm would not place a strain on the local road network when combined with construction/operational traffic from the Hunter River Solar Farm. <u>Accommodation/regional services</u> As it is expected construction of the Denman Road Solar Farm would be completed prior to construction of the Hunter River Solar Farm commencing, there would be no overlap of the two Projects in requiring accommodation and services during their construction periods.

Appendix F Scoping report summary worksheet

Level of assessment	Matter	CIA	Engagement	Scoping report reference (where description of potential impact is included)	Relevant government plans, policies and guidelines
Detailed	Biodiversity	Yes	General	Section 6.2	- NSW Biosecurity Strategy 2013-2021 - Biodiversity Assessment Method (BAM) (NSW Government, 2020).
Detailed	Amenity - visual	Yes	Specific	Section 6.3	Refer to scoping report.
Detailed	Amenity - noise	Yes	General	Section 6.4	- Construction Noise Strategy (Transport for NSW, 2012) - Interim Construction Noise Guideline (Department of Environment, Climate Change and Water, 2009) - NSW Industrial Noise Policy (Environment Protection Authority, 2000) - NSW Road Noise Policy (Environment Protection Authority, 2011) - Assessing Vibration: A Technical Guideline (Department of Environment and Conservation, 2006) - German Standard DIN 4150-3: Structural Vibration – Effects of Vibration on Structures - Environmental Noise Management Assessing Vibration: A Technical Guideline (Department of Environment and Conservation, 2006).
Standard	Land – land use	No	General	Section 6.5	- Agricultural Land Use Mapping Resources in NSW - The Land and Soil Capability Scheme (Office of Environment and Heritage, 2012).
Standard	Land – soils and contamination	No	General	Section 6.6	- Acid Sulphate Soils Assessment Guidelines (Department of Planning, 2008) - The Land and Soil Capability Scheme (Office of Environment and Heritage, 2012) - Soil and Land Survey Handbooks - Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004) - Managing Urban Stormwater: Soils and Construction Volume 2 (Department of Environment and Climate Change, 2008) - Agricultural Land Use Mapping Resources in NSW
Detailed	Heritage - Aboriginal	No	Specific	Section 6.7	- Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW 2011 - Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 - Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW 2010.
Detailed	Heritage – non-indigenous	No	Specific	Section 6.8	- Commonwealth EPBC 1.1 Significant Impact Guidelines – Matters of National Environmental Significance (Commonwealth of Australia, 2013) - Commonwealth EPBC 1.2 Significant Impact Guidelines – Actions on, or impacting upon, Commonwealth Land and Actions by Commonwealth Agencies (Commonwealth of Australia, 2013) - NSW Skeletal Remains: Guidelines for Management of Human Remains (Heritage Office, 1998) - Criteria for the Assessment of Excavation Directors (NSW Heritage Council, 2011).

Level of assessment	Matter	CIA	Engagement	Scoping report reference (where description of potential impact is included)	Relevant government plans, policies and guidelines
Detailed	Access – traffic	Yes	Specific	Section 6.9	- Austroads Guidelines for Road Design (Austroads) - Austroads Guidelines for Traffic Management (Austroads) - Guide to Traffic Management – Part 3 Traffic Studies and Analysis (Austroads, 2013)
Detailed	Socio-economic impacts	Yes	Specific	Section 6.10	- Social Impact Assessment Guidelines for State Significant Projects (Department of Planning Industry and Environment, 2021) - Undertaking Engagement Guideline for State Significant Projects (Department of Planning Industry and Environment, 2021)
Detailed	Water – hydrology and groundwaters	No	General	Section 6.11.1	- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018) - NSW Water and River Flow Objectives (NSW Government, 2006) - Floodplain Risk Management Guidelines (Department of Environment and Climate Change, 2016) - Floodplain Development Manual: The management of flood liable land (NSW Government, 2005) - Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004) - Managing Urban Stormwater: Soils and Construction Volume 2 (Department of Environment and Climate Change, 2008) - NSW State groundwater dependent ecosystem policy (Department of Land, Water and Climate, 2002). - NSW Government's Floodplain Development Manual (2005).
Standard	Hazards and risks - bushfire	No	General	Section 6.11.2	Planning for Bushfire Protection (NSW Rural Fire Service, 2019).
Standard	Hazards and risks - EMF	No	General	Section 6.11.3	NSW Large-scale solar energy guideline for State Significant Development (Department of Planning and Environment, 2018).
Detailed	Hazards and risks – glint and glare	No	General	Section 6.2.6	- FAA, “Technical Guidance for Evaluating Selected Solar Technologies on Airports”, Federal Aviation Administration, Washington, D.C., November 2010. - FAA, “Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports”, Federal Register, Oct. 23, 2013. - FAA, “Technical Guidance for Evaluating Selected Solar Technologies on Airports”, Federal Aviation Administration, Washington, D.C., Version 1.1, April 2018. - AS/NZS 4282:2019, AS 4282-2019, AS 1158-2005 - Clean Energy Council nuisance glare guidelines https://www.cleanenergycouncil.org.au/industry/products/modules
Standard	Air - air quality and climate	No	General	Section 6.11.5	- NSW Climate Change Policy Framework (Office of Environment and Heritage, 2016) - National Greenhouse Accounts Factors (Australian Government, 2021)
Standard	Waste Management	No	General	Section 6.11.6	Waste Classification Guidelines (DECCW, 2009)
Standard	Cumulative impacts	N/A	General	Section 6.11.7	Cumulative Impact Assessment Guidelines for State Significant Projects (Department of Planning Industry and Environment, 2021)