Prepared for
Pacific Partnerships Pty Ltd
ABN: 85 601 328 741

Environmental Impact Statement

SSD-29491142

31-Jul-2025
Cobbora Solar Farm

Environmental Impact Statement

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Client: Pacific Partnerships Pty Ltd

ABN: 85 601 328 741

Prepared by

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REAP declaration

Project details
Project name: Cobbora Solar Farm
Application number: (SSD-29491142
Address of the land in respect of which the development application is made: 1050 Spring Ridge Road Cobbora NSW 2475 Golden Highway Dunedoo NSW 2844 9 Sandy Creek Road Cobbora NSW 2844 Sandy Creek Road Cobbora 2844 445 Sweeneys Lane Elong Elong NSW 2831 530 Sweeneys Lane Goolma NSW 2852
Applicant details
Applicant name: Cobbora Solar Farm Pty Ltd
Applicant address: Level 25, 177 Pacific Highway, North Sydney, NSW 2060
Details of person by whom this EIS was prepared
Name: Kate Every
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Professional qualifications: BSc, MEnvMgt
Declaration by registered environmental assessment practitioner
Name: Jamie McMahon
Registration number: R80013
Organisation registered with: Environment Institute of Australia and New Zealand
The undersigned declares that this EIS: • has been prepared in accordance with the Environmental Planning and Assessment Regulation 2021; • contains all available information relevant to the environmental assessment of the development, activity or infrastructure to which the EIS relates; • does not contain information that is false or misleading; • addresses the Planning Secretary's environmental assessment requirements (SEARs) for the project; • identifies and addresses the relevant statutory requirements for the project, including any relevant matters for consideration in environmental planning instruments; • has been prepared having regard to the Department's State Significant Development Guidelines - Preparing an Environmental Impact Statement; • contains a simple and easy to understand summary of the project as a whole, having regard to the economic, environmental and social impacts of the project and the principles of ecologically sustainable development; • contains a consolidated description of the project in a single chapter of the EIS; • contains an accurate summary of the findings of any community engagement; and • contains an accurate summary of the detailed technical assessment of the impacts of the project as a whole.
Signature
Date 31 July 2025

Summary

Introduction

Cobbora Solar Farm Pty Ltd (the Proponent), in its capacity as trustee for the Cobbora Solar Farm Trust, (a wholly owned subsidiary of Pacific Partnerships Pty Ltd), is seeking development consent to construct, operate and decommission the Cobbora Solar Farm in the central west region of New South Wales (NSW).

The Cobbora Solar Farm is a significant renewable energy project which aims to generate up to 700 megawatts (MW) of electricity using photovoltaic (PV) solar panels. It also includes a 400 MW / 1600 megawatt-hour (MWh) battery energy storage system (BESS) and the necessary infrastructure to connect to the national electricity market (NEM) (the Project).

Project description

The Project involves the construction, operation and decommissioning of the Cobbora Solar Farm and BESS. The solar farm and BESS will connect to the CWO REZ grid infrastructure via the Elong Elong Energy Hub located directly to the south of the Project Area.

Key features of the Project are summarised in **Table 1** and an indicative process flow diagram is shown on **Plate 1**.

Table 1 Key features of the Project

Project	Cobbora Solar Farm
Key features	**Key infrastructure:** 700 MW AC solar farm, 400 MW / 1,600 MWh BESS and up to four substations (five potential substation locations have been assessed in this EIS, which will be reduced during detailed design). **Ancillary infrastructure:** Internal roads, waterway crossings, car parking, operation offices and control room, workshop, amenities, storage facilities, underground and overhead cabling, fencing and landscaping. **Temporary construction areas:** Compounds, laydown areas, stockpiles, parking, helicopter landing site (emergencies only) and workforce accommodation.
Project location	Approximately 20 km south-west of Dunedoo and 55 km east of Dubbo in the Central West Orana (CWO) Renewable Energy Zone (REZ).
Development Footprint	Approximately 1,600 ha, including all disturbance areas (i.e. all areas occupied by the key infrastructure, ancillary infrastructure and temporary construction areas).
Access	Four access points along Spring Ridge Road and one on the Golden Highway.
Grid connection	Up to four grid substations connecting to the Elong Elong Energy Hub and on to the NEM.
Construction	**Expected duration:** 47 months (including commissioning) **Construction hours:** Standard working hours (EPA, 2020) **Number of workers:** Up to 734 full-time-equivalent (FTE) workers during the peak construction period (during peak) **Number of vehicle movements:** 14 light, 88 heavy and 2 OSOM vehicles per day, and 34 shuttle bus movements per fortnight (two weeks) (during peak).
Workforce accommodation	Around 9 ha in size and will accommodate the total maximum workforce required. By providing workforce accommodation, the Project seeks to limit pressure on the local housing market and nearby community services.
Operational	**Expected lifespan:** 35 years for the solar farm and 25 years for the BESS (may be subject to extension subject to further planning approval)

Project	Cobbora Solar Farm
	Operational hours: daylight hours, 7 days a week for the solar farm and 24 hours per day, 7 days a week for the BESS. If necessary, reactive or emergency maintenance may need to occur outside of standard working hours, however this is expected to be rare and will be appropriately notified to neighbouring properties affected by the works. **Number of workers:** 20 FTE workers
Decommissioning and rehabilitation	At the end of the Project's operational life all above ground components will be removed and re-purposed where possible and land rehabilitated to achieve pre-existing conditions as far as reasonably practicable.
Estimated cost of development	$1.38 billion

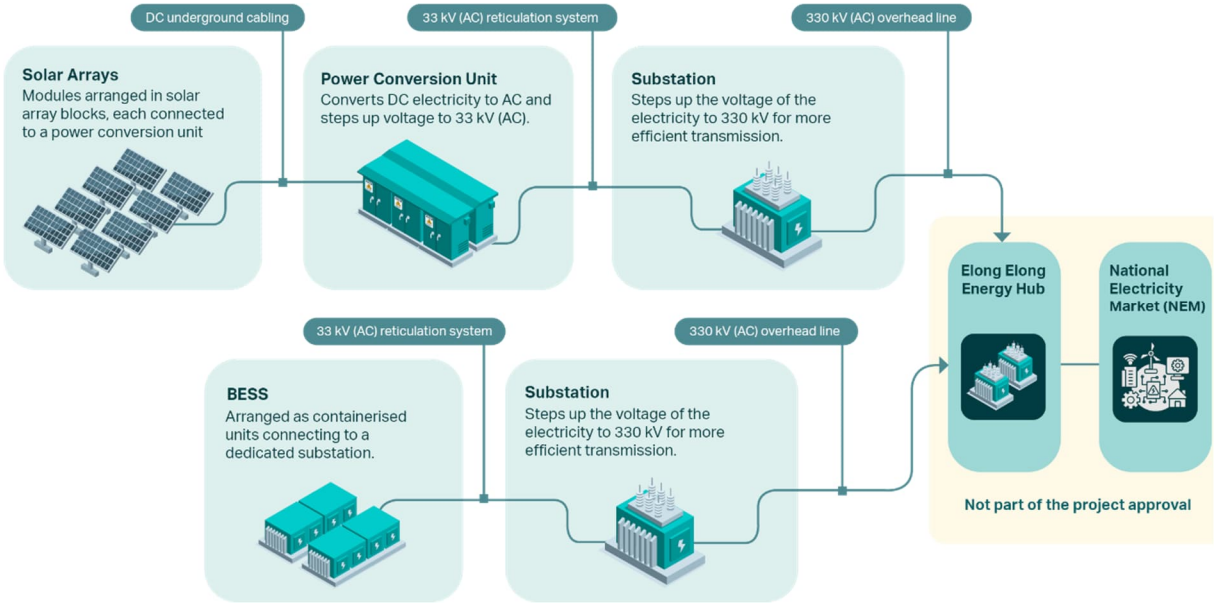

Plate 1 Indicative process flow diagram of Project components

The Project includes two key boundaries, being:

- **Development Footprint:** an area of approximately 1,600 ha which includes all construction and operational disturbance areas (ie key infrastructure, ancillary infrastructure and temporary construction areas)
- **Project Area:** an area of approximately 3,000 ha which includes the Development Footprint, as well as buffer areas or areas with high environmental value which have been excluded to avoid disturbance. The land outside the Development Footprint will be used for complementary purposes such as conservation, agricultural activities or environmental management.

Strategic context

The key strategic driver of the Project is to support Australia's transition to renewable energy while addressing the urgent need to replace retiring coal-fired power stations in the NEM. This aligns with Australia's commitments under the Paris Agreement and the Net Zero Plan, aiming to achieve net-zero emissions by 2050.

The Project also aligns with other key government strategies, including Australia's Long-Term Emissions Reduction Plan, NSW Electricity Infrastructure Roadmap, Dubbo Regional Council's "Towards 2040" Community Strategic Plan and Warrumbungle Shire Council's Community Strategic Plan 2022/2037. These strategies emphasise environmental sustainability, economic growth and the transition of Australia's economy to one based primarily on renewable energy.

The Project seeks to improve energy reliability, reduce carbon emissions, and contribute to the decarbonisation of the energy sector, while fostering sustainability and economic growth in regional NSW.

The Project is expected to provide benefits to the State and local community. Key benefits include:

- Contribution to NSW's energy supply
- Reduction of carbon emissions
- Direct investment in regional NSW.

The Project Area was strategically chosen within the CWO REZ due to several favourable site characteristics, including suitable topography, the lack of biophysical strategic agricultural land, limited flooding potential, limited potential views from neighbouring properties, proximity to a robust road network and favourable solar resource.

The Development Footprint (a subset of the Project Area) has been subject to ongoing refinements throughout the development of the Project to enhance the suitability of the Project to the location. This has included the adjustment of the solar array area to avoid large contiguous vegetated areas, Aboriginal heritage sites, waterways, and areas subject to flooding.

Statutory context

The Project is classified as state significant development (SSD) (SSD- 29491142) based on Schedule 1 of *State Environmental Planning Policy (Planning Systems) 2021*. As such, development consent is required for the Project under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). This EIS has been prepared to address as part of the development application for the Project and in doing so has addressed the Planning Secretary's Environmental Assessment Requirements (SEARs) issued on 7 November 2024.

The Project was referred to the Commonwealth Minster of the Environment and Water under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (EPBC Ref: 2022/09269). The Project was determined to be a controlled action on 29 September 2022. As such, the EIS also has addressed the supplementary SEARs provided by the Minister, with view to the Project being determined for approval under the EPBC Act.

Engagement

Engagement for the Project was initially commenced by the original developer, Marble Energy, in 2020, with this being taken over by the Proponent from June 2024. The Proponent is committed to meaningful and responsive community engagement. The stakeholder and community engagement process for the Project was designed to be transparent, inclusive and tailored to the Project's scale and potential impacts.

A range of stakeholders, community groups and individuals were consulted. These included state, federal, state and local government (Commonwealth DCCEEW, various NSW state agencies, Warrumbungle Shire Council and Dubbo Regional Council), neighbouring landowners and the broader community, Indigenous groups, other stakeholders (i.e. utility providers), as well as business, environment and community groups. A variety of tools and activities were employed to effectively engage stakeholders, including combined face-to-face interactions with digital tools to maximise outreach and understanding.

Clear communication was prioritised, offering stakeholders opportunities to interact directly with the project team and better understand the Project. The Project team focused on ensuring stakeholders' concerns were addressed, and that their input was integrated into project decisions wherever feasible.

Environmental assessment

Biodiversity

A Biodiversity Development Assessment Report (BDAR) was prepared by Biosis in accordance with the requirements of the Biodiversity Assessment Method (BAM) (DPIE 2020) and the Biodiversity Offset Scheme (BOS).

The Project Area is primarily used for livestock grazing and cropping, with native vegetation concentrated in elevated ridgelines, foothills, and road reserves. Eight Plant Community Types (PCTs) were identified within the Project Area, three of which are listed as threatened ecological communities (TECs) under the NSW *Biodiversity Conservation Act 2016* (BC Act). Two of these are also listed as threatened under the EPBC Act. These TECs are shown in **Table 2**.

Construction of the Project will result in direct impacts to biodiversity, some of which cannot be avoided. The primary direct impact of the Project to biodiversity will be the clearing of native vegetation within the Development Footprint. This will affect approximately 250 ha of native vegetation and 1,349 ha of Category 1 – Exempt land, including up to 166 scattered trees, 75 of which include hollows. This will also result in the removal of potential habitat for the Pine Donkey Orchid, which was observed during surveys (refer to **Table 3)**.

A range of indirect and prescribed impacts were also assessed as part of the BDAR including edge effects, reduction in habitat and connectivity, introduction of weeds and pathogens and impacts on water bodies. Overall, potential indirect impacts during the construction of the Project have been assessed as low to moderate.

The Project has undergone numerous design refinements to avoid areas of high biodiversity value and reduce impacts on threatened species and ecological communities. The impacts assessed in the BDAR represent a worst-case scenario, accounting for permanent vegetation loss, although native ground cover under solar arrays is expected to regenerate during operation. Additional native screening planting will also be implemented at certain locations around the Project, contributing to improving native vegetation cover in the area in the long term. A Biodiversity Management Plan will be prepared and implemented during the construction and operation of the Project, including measures to protect retained vegetation. A Biosecurity Management Plan will be also prepared, including hygiene protocols, material inspections, and monitoring programs.

Table 2 Summary of direct impacts to threatened ecological communities

PCT (Condition)	Associated TEC	Area to be cleared (ha)
81 (Low)	Grey Box Woodland - Endangered BC Act	24.90
81 (Moderate)	Grey Box Woodland - Endangered BC Act and Endangered EPBC Act	6.60
201 (Low)	Fuzzy Box Woodland – Endangered BC Act	5.91
201 (Moderate)	Fuzzy Box Woodland – Endangered BC Act	2.80
281 (Low)	Box Gum Woodland – Critically Endangered BC Act	42.30
281 (Moderate)	Box Gum Woodland - Critically Endangered BC Act and Critically Endangered EPBC Act	9.25
599 (DNG)	Box Gum Woodland - Critically Endangered BC Act	56.88
Other native PCTs	N/A	102.30
Total native vegetation direct impacts		250.94

Table 3 Threatened species habitat to be cleared

Species	Sensitivity	Area of habitat to be cleared (ha)
Pine Donkey Orchid *Diuris tricolor*	Moderate	4.50

Based on the result of the BAM calculator it was determined that the Project requires a total of 3,918 biodiversity credits to compensate for the impacts outlined above. In order to secure the required biodiversity credits the Proponent has commenced investigations into the establishment of local Biodiversity Stewardship Sites.

Aboriginal heritage

An Aboriginal Cultural Heritage Assessment Report (ACHAR) was prepared by OzArk Environment and Heritage to assess potential Aboriginal cultural heritage impacts associated with the Project. Consultation with Aboriginal community stakeholders was conducted in accordance with Aboriginal Cultural Heritage Consultation Requirement (ACHCRs) for Proponents (DECCW, 2010).

The assessment involved archaeological field surveys and desktop surveys of the Project Area. A total of 137 Aboriginal Heritage Information Management System (AHIMS) registered sites were recorded within, or extending into, the Project Area along with 32 Potential Archaeological Deposits (PADs). These sites include artefact scatters, isolated finds and culturally modified trees.

Impacts on heritage items have been either avoided or mitigated by altering the Development Footprint to conserve identified Aboriginal sites or the proposed implementation of an Aboriginal Cultural Heritage Management Plan which includes the protocols for the long-term management of Aboriginal objects. However, 22 of the 137 AHIMS registered sites will still be impacted. This includes nine isolated finds and 13 artefact scatters, with 18 sites entirely within the Development Footprint, resulting in a total loss of value, and four sites partially within the Development Footprint, resulting in a partial loss of value. Additionally, three PAD sites will be partially impacted by electrical infrastructure installation, though the detailed design will aim to avoid harm to these where possible. If avoidance is not possible test excavation of the discreet areas will likely be required.

Of the 22 affected sites, 20 have been assessed as having low scientific value, one as moderate scientific value and one as high scientific value. Of the three PADs that will be partially impacted, one has been assessed as having high scientific value. The scientific values of the other two PADS are not yet known, however both are associated with sites assessed as having low scientific value. While partial impact to a site of recorded high scientific value is proposed, the ACHAR concluded that there will be a moderate overall impact to Aboriginal cultural heritage values within the Project Area.

Historic heritage

A Historic Heritage Impact Assessment Report (HHAR) was prepared by OzArk Environment & Heritage to assess potential impacts to historic heritage.

The assessment involved field surveys and desktop surveys of the Project Area. Two historic heritage items (Mechanical seeder (HS01) and a House and outbuildings (HS04)) were identified within the Project Area. HS04 is located partially within the Development Footprint and will be demolished as part of the Project. Using the *Guidelines for assessing places and objects against the Heritage Council of NSW criteria* (DPE 2023), both items were assessed as being of no heritage significance and are not protected under the NSW *Heritage Act 1977*. Accordingly, there are no impacts proposed to historic heritage.

Geology, soil and land use

A soils, land and agricultural impact assessment was prepared by Minesoils to assess the potential impacts associated with the construction and operation of the Project.

The assessment involved a soil survey and desktop surveys of the Project Area. The land and soil capability (LSC) assessment, conducted as part of the soil survey, classified the Development Footprint as:

- LSC class 3: high capability land (873 ha)
- LSC class 4: moderate capability land (437 ha)
- LSC class 5: moderate low capability land (298 ha).

Active erosion and sedimentation presence (sheet and gully erosion) was observed during the soil survey. The Project's risk of causing additional erosion is moderate to high due to the presence of dispersive soils, though this risk is considered manageable. Additionally, it is anticipated there will be no

permanent impacts on LSC classes within the Development Footprint as a result of the Project, providing the recommended soil management and mitigation measures are implemented.

Agricultural land use in the Dubbo Regional local government area (LGA) and Warrumbungle LGA will be reduced by the Project temporarily during construction by 0.3% and 0.1% respectively, once operational. There will be no permanent decrease in land available for agriculture use.

The impacts to LSC 3 land, agricultural land use and primary productivity are considered minor in the context of existing presence of similar land within the Dubbo and Warrumbungle LGAs.

Visual

A Landscape Character and Visual Impact Assessment (LCVIA) was prepared by Moir Studio to assess the potential impacts to landscape character and visual amenity associated with the construction and operation of the Project. The assessment involved a site visit and desktop surveys of the Project Area.

The topography of the Project Area, which includes flat and slightly undulating landscapes, results in a visually compartmentalised landscape with some opportunities for viewing longer distances. Large patches of retained vegetation and sporadic bands of trees limit distant views.

The LVIA identified two landscape character zones (LCZs) within and surrounding the Project Area. A summary of the potential operational impacts to each LCZ is provided in **Table 4**.

Table 4 Landscape character impact of landscape character zones

LCZ	Scenic quality rating	Sensitivity	Magnitude	Landscape character impact
LCZ 1: Agricultural Pastures	Low	Low	Moderate	Low
LCZ 2: Vegetated Hills	Low	Moderate	Low	Low

The LCVIA included a simple, intermediate and detailed assessment of visual impacts on accordance with the Large-scale Solar Energy Guideline. The simple visual impact assessment identified 15 private viewpoints and eight public viewpoints requiring further assessment. These viewpoints were subject to an intermediate assessment, with five private and five public viewpoints identified as requiring detailed assessment. The detailed assessment concluded that only one public viewpoint will be subject to a moderate impact, with all other viewpoints assessed as having a low to very low visual impact.

The LVIA also considered the impact of glint and glare. A summary of the results is provided in **Table 5**.

Table 5 Glint and glare impacts

Viewpoints	Description of impact
Residential	No potential “Yellow” or “Green” glare has been identified for any non-associated dwellings identified within 3 km of the Development Footprint.
Road	Spring Ridge Road, Sweeneys Lane and Tallawonga Road will experience potential “Green” glare. No roads have the potential for “Yellow” glare. Due to the speed of travel along the road, the time frame to experience the impacts of “Green” glare are short, therefore, the impacts of “Green” glare are low and do not require mitigation.

Mitigation measures are recommended to address adverse impacts, including a landscaping plan for on-site perimeter planting to be developed in consultation with affected landowners. Overall, the existing landscape has the ability to absorb the Project with a low degree of visual impact.

Noise and vibration

A Noise and Vibration Impact Assessment (NVIA) was prepared by AECOM to assess the potential noise and vibration impacts associated with construction and operation of the Project.

Noise from construction activities is predicted to comply with the recommended noise management levels (NMLs) at all but three receivers. No receivers will be subject to noise levels exceeding the 'highly noise affected' level of 75 dB(A).

Noise levels are predicted to comply with the most stringent (evening time) operational noise criteria at all locations. However, with the application of a conservative assumption of equipment tonality (applied through a 5dB correction factor), noise levels may exceed the Project-specific noise limits at three receivers. In the event that noise modelling at detailed design indicates that exceedances persist, the Project has identified an alternative layout option with four solar farm inverters relocated away from receivers. Modelling indicates that this alternative layout option would reduce noise levels to within Project-specific noise limits, except for negligible (1 dB) exceedances predicted at two receivers.

Noise generated by the BESS during the evening and night-time periods is predicted to be compliant for all receivers.Compliance with safe working distances for vibration-intensive equipment will ensure that no vibration impacts occur. Mitigation measures are proposed to address residual noise impacts. Overall, noise impacts on surrounding receivers are considered to be minor.

Traffic and Transport

A Traffic and Transport Impact Assessment (TTIA) was prepared by AECOM to assess potential traffic impacts associated with the construction, operation, and decommissioning of the Project.

The main vehicle access to the Project during both construction and operation will be via Spring Ridge Road, with four vehicle access points proposed along this road. There will also be a vehicle access point off the Golden Highway into the northwestern corner of the Project Area. These access points will be upgraded, as required, as part of the Project to provide widened entries to facilitate safe turning movements for heavy construction vehicles.

During the peak construction period, it is expected that up to seven light vehicles and 44 heavy vehicles per day will be required to access the Project Area, and up to one oversize and over mass (OSOM) vehicle per day, as required. Workers will operate at the site on a fly in fly out basis, with shuttle buses will transport them from nearby airports to the Project Area. It is anticipated that up to 17 shuttles buses will be required fortnightly for this purpose. This equates to 14 light vehicles movements (two-way) and 88 heavy vehicle movements (two-way) per day, and 34 shuttle bus movements (two-way) per fortnight.

The TTIA found that the Golden Highway and Spring Ridge Road have sufficient capacity to accommodate the expected increased traffic volumes. As such, overall, traffic impacts as a result of the Project are considered minor.

To monitor and manage the impact of Project construction traffic pre-construction pavement condition assessments are proposed along Spring Ridge Road. Consultation with nearby projects, including Sandy Creek Solar Farm and Elong Elong Energy Hub, and Dubbo Regional and Warrumbungle Shire councils will be undertaken to coordinate any other potential upgrades.

Flooding

A Flooding Impact Assessment report was prepared by AECOM to assess potential flooding impacts associated with the construction and operation of the Project.

The Project Area is traversed by two main creeks, Laheys Creek and Sandy Creek, which flow northwards and eventually join the Talbragar River to the north of the Project Area. These creeks exhibit concentrated flows in heavy rains, with inundation of adjacent floodplains occurring in response to rarer (higher intensity) rainfall events. A significant amount of existing floodplain storage is associated with these creeks, with attenuation of flows occurring in the floodplain storage within the Project Area.

Laheys Creek and the upper reaches of Sandy Creek are subject to moderate flow depths (generally less than 3 m), with their modelled flows inundating adjacent floodplains. The lower reaches of Sandy Creek, where the waterway approaches the Golden Highway, are subject to wider floodplain responses compared to the upper region of the creeks, with deeper ponding of water evident.

The operational phase of the Project may result in changes to surface conditions due to the installation of impervious solar panels. The panels could also reduce hydraulic roughness by reducing vegetation growth underneath. Other infrastructure, such as the BESS and substations, may cause minor rerouting and disruption of shallow flows, but the overall impact is expected to be minor.

Three bridge crossings are proposed to support the Project: two along Sandy Creek and one along Laheys Creek. The Flooding Impact Assessment identified that the proposed creek crossings may be overtopped during all modelled Annual Exceedance Probability events (i.e. 20% [statistically, a once every 5 year event], 1% [statistically, a once every 100 year event]). In the floodplain and surrounding areas, the model shows that flood depths slightly decrease in the locations planned for solar panel arrays and internal roads. These areas also experience little to no change in water velocity.

Surface water, groundwater and water use

Surface water, groundwater and water use within the Project Area were assessed by AECOM through a review of available online databases, mapping and specific studies completed for the Project or nearby projects. The Project Area is located within the Macquarie-Bogan River Catchment.

Most of the Project has been designed to maintain a separation of at least 50 m from Sandy and Laheys Creeks, reducing the potential for construction activities to affect these waterways. To manage direct impacts to riparian land when constructing the new creek crossings, crane platforms will be constructed at least 20 m from riparian land, where possible, with pre-cast bridges being lifted into place. No removal of riparian vegetation will be required for the construction of these crossing, with sites selected to avoid disturbance.

Water demand for construction of the Project is estimated to be approximately 410 megalitres (ML) over the 36-month construction period (excluding commissioning works). It is anticipated that non-potable water (e.g. for construction and toilets), estimated to be about 180 ML, will be trucked to site or sourced from onsite licenced groundwater bores. If groundwater is used, this will require about 0.25% of the allocated share for commercial extraction in the local groundwater source. Approximately 57 ML of potable water will also be trucked to site by a commercial water tanker from a licensed source and stored in tanks on site until needed.

Water use during operation is minimal, primarily for module cleaning. This water will be sourced from licensed groundwater bores or trucked to site under commercial arrangement and stored in tanks until needed. Groundwater extraction, if required, is estimated to be 0.25 ML per year, which is considered a negligible fraction of the allocated share for commercial extraction in the local groundwater sources.

Overall, the impacts to surface water quality and groundwater resources will be effectively mitigated by the application of standard management measures.

Hazards and risk

A Preliminary Hazards Analysis (PHA) was prepared by Planager to assess the potential hazards and risk associated with the construction and operation of the Project.

The Project involves the storage and transport of hazardous materials such as lithium-ion batteries, coolant mixtures, petroleum products, and compressed refrigerant gases. The Project is not considered potentially hazardous based on the storage and transport of these materials as they are not expected to exceed relevant risk screening thresholds.

Potential hazards from the Project are associated with ‘other types of hazards’, with five hazardous incident scenarios being identified, including:

- Thermal runaway and fire in battery enclosures
- Loss of containment of pollutant materials
- Electrical faults leading to fire or arc flash
- External fires causing damage to project infrastructure
- Construction-related incidents.

Broader risk from thermal runaway events in battery enclosures is mitigated by the 25 m separation of the BESS from the nearest vegetation. Compliance with Australian Standards ensures the risks of loss

of containment or electrical fault are effectively managed. The Project's design and adherence to codes (including appropriate asset protection zones (APZ)) minimises the risk from external hazards like bushfires, lightning, and earthquakes. The risk of construction-related incidents, such as damage to the nearby high-pressure pipeline, is considered rare due to separation distances and adherence to safety protocols.

Given the typical separation distances between the electric and magnetic field (EMF) producing equipment from residential receivers, and the low levels of EMFs expected to be produced by the Project, the impact of EMF exposure to workers or the public will be low.

The PHA found that the Project can be managed in accordance with the established risk criteria and in accordance with "as low as reasonably practicable" (ALARP) principles.

Bushfire

A Bushfire Threat Assessment (BTA) was prepared by BlackAsh Bushfire Consulting in accordance with Planning for Bushfire Protection (PBP) (NSW RFS, 2019), to assess the potential bushfire hazards and risks associated with the construction and operation of the Project.

The Project Area and surrounds are mapped as Category 1 and Category 2 Bushfire Prone Land.

The BTA demonstrates that the Project meets and exceeds the NSW APZ requirements under PBP. These measures mitigate against a fire occurring onsite spreading to surrounding areas. A comprehensive Bushfire Emergency Management and Operations Plan (BEMOP) will be developed of the Project's operation, in consultation with local emergency services.

The BTA concluded that the Project Area is suitable for the development and operation of a solar farm and BESS.

Social and economic

A Social and Economic Impact Assessment (SEIA) has been prepared by AECOM to assess the impacts of the Project in accordance with the *Social Impact Assessment Guideline for State Significant Projects* (DPIE, 2023) (SIA Guideline).

The Socio-Economic Index for Areas (SEIFA) is produced by the Australian Bureau of Statistics (ABS) as an indicator of relative socio-economic advantage and disadvantage, being people's access to material and social resources, and their ability to participate in society. The indices outlined by the SEIFA indicated the following for the LGAs:

- Index of Relative Socio-economic Advantage and Disadvantage
    - **Dubbo Regional**: 40% of LGAs within NSW and Australia are more disadvantaged
    - **Warrumbungle Shire**: 70% of LGAs within NSW and Australia are more disadvantaged.
- Index of Economic Resources
    - **Dubbo Regional**: 70% of LGAs within Australia and 80% of LGAs within NSW have greater levels of economic resources
    - **Warrumbungle Shire**: 40% of LGAs within NSW and Australia have greater levels of economic resources.

The Project Area is rural, with the only social infrastructure within a 5 km radius being the Tuckland State Forest.

Potential social outcomes of the Project during construction include:

- Potential minor changes on the makeup of the local community in the region
- Minor adverse impacts to local amenity, particularly through noise and visual amenity
- Economic benefits during construction arising from increased expenditure at local businesses.

Potential social impacts resulting from amenity changes (such as noise and vibration, air quality, visual impacts, and traffic) during construction will be largely managed through mitigation and management

specified for those topics. On this basis, the SIA concluded that the adverse impacts of the Project will be addressed appropriately.

Other issues

Waste management

A qualitative desktop assessment was carried out to estimate waste types and quantities associated with the Project.

Waste policy in NSW emphasise efficient resource use and minimising waste generation. Waste management strategies follow a hierarchy: avoidance, resource recovery (reuse, recycling, energy recovery) and disposal.

Typical waste types generated during construction include general construction waste (approximately 5,000 tonnes), fuels, lubricants and chemicals (approximately 14,000 litres) and sewage (approximately 95,000 m^3).

The waste generated during operation will be minimal and can be managed using conventional waste collection, handling and disposal procedures in compliance with regulatory requirements. Wastes generated during operation includes fuels, lubricants and chemicals, and domestic waste generated by workers. These wastes will be generated at variable quantities over the full expected 35 year life of the Project. During decommissioning, the key waste stream will be associated with removal of infrastructure.

A Waste Management Plan (WMP) will be developed to address waste during construction, operation and decommissioning. The WMP will prioritise minimising construction waste, recycling key elements and monitoring technological advancements for efficient recycling methods as they develop. If required, investigations into waste and recycling options in broader NSW will be undertaken to ensure there is capacity at facilities to support the Project. The Proponent will also engage with EnergyCo and other developers to prepare a strategy to minimise impact to local waste facilities, where possible.

Air quality

A qualitative desktop assessment was carried out to estimate the potential air quality impacts associated with the Project.

The Project is located in a predominantly agricultural area, with dispersed populations and no major air-polluting industries.

During construction, dust emissions from earthworks and vehicle movements, and emissions from machinery and transport vehicles are anticipated. These impacts will be temporary and are not considered likely to be significant. During operation, localised dust emissions from internal road traffic and emissions from maintenance activities are anticipated but considered negligible. The application of standard mitigation and management measures will ensure compliance with air quality standards and minimise impacts on sensitive receptors.

A key environmental benefit of the Project is the generation of electricity without significant greenhouse gas emissions, contributing positively to climate change mitigation.

Cumulative impacts

Cumulative impacts occur when the impacts from a project interact or overlap with impacts from other projects. Several other renewable energy projects are proposed nearby, including Sandy Creek Solar Farm, Elong Elong Energy Hub, Spicers Creek Wind Farm and Dapper Solar Farm. No other large developments are proposed.

There is potential for cumulative impacts associated with: loss of sensitive or threatened biodiversity values, increased traffic volumes on the surrounding road network, noise impacts from simultaneous construction activities and operations, changes to the surrounding landscape and visual impacts and impacts to registered heritage items. Additionally, an influx of out of area workers across several projects can have a cumulative impact on the social environment of nearby towns and the use of social infrastructure.

Overall, it is considered that the Project's committed mitigation measures and careful planning of Project construction will address these challenges effectively. Additionally, EnergyCo, in conjunction

with a range of NSW Government Agencies, is currently preparing a study of cumulative impacts for the CWO REZ. The outcomes of the study will allow State and local governments to make better informed decisions on matters such as population growth and change, housing supply, infrastructure delivery, waste management and access to local water resources. Improved management of these issues at a strategic level will help to address cumulative impacts on communities within and around the CWO REZ.

Justification

The development of the Project is supported by Commonwealth, State, regional and local plans and policies and will support the government aspirations with respect to greenhouse gas (GHG) emission reduction targets.

Despite the Project's design seeking to avoid adverse environmental and social impacts, some impacts associated with construction and operation are inevitable. These impacts will, however, be subject to mitigation and management measures outlined throughout the EIS such that any residual impacts are not expected to be significant.

Overall, this EIS concludes that the Project should proceed as:

- it aligns with Australia's commitments under the Paris Agreement and the Net Zero Plan, aiming to achieve net-zero emissions by 2050
- the Project Area was strategically chosen within the CWO REZ due to several favourable site characteristics, including suitable topography, the lack of biophysical strategic agricultural land, limited flooding potential, limited potential views from neighbouring properties, proximity to a robust road network and favourable solar resource.
- it will provide for the advantageous, orderly and economic use of land
- It will deliver economic benefits to the local region, including the provision of social and economic benefits to both the local community and surrounding region throughout the Project's construction and ongoing operation.
- it satisfies the principles of Ecologically Sustainable Development (ESD) as described in the EP&A Regulation.

Considering the ability of the identified impacts to be suitably mitigated or managed, the Project's benefits are deemed to outweigh the potential impacts, and the Project is considered to be in the public interest. Based on the findings detailed within this EIS, the Project is considered justified and recommended for development consent.

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Glossary

Term / acronym	Description
1P	'one-in-portrait'
2D	Two-dimensional
2P	'two-in-portrait'
AADT	Annual Average Daily Traffic
AAR	Aboriginal Archaeological Report
ACEREZ	ACEREZ Partnership (formally operated by Transgrid)
ACHAR	Aboriginal Cultural Heritage Assessment Report
ACHCR	Aboriginal Cultural Heritage Consultation Requirement
ACHMP	Aboriginal Cultural Heritage Management Plan
AEMO	Australian Energy Market Operator
AEP	Annual Exceedance Probability
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
ALARP	As low as reasonably practicable
ALR Act	Aboriginal Land Rights Act 1983 (NSW)
APZ	Asset Protection Zone
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
ARTC	Australian Rail Track Corporation
ASC	Australian Soil Classification
ASIRF	Aboriginal Site Impact Recording Form
ATSIHP Act	*Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Cth)
BAM	Biodiversity Assessment Method (NSW)
BC Act	*Biodiversity Conservation Act 2016* (NSW)
BDAR	Biodiversity Development Assessment Report
BEMOP	Bushfire Emergency Management & Operations Plan
BESS	Battery Energy Storage System
Biosecurity Act	*Biosecurity Act 2015* (NSW)
BMP	Biodiversity Management Plan
BMS	Battery Management System
BOM	Bureau of Meteorology
BOS	Biodiversity Offset Scheme
BPESC	Best Practices in Erosion and Sediment Control
BSAL	Biophysical strategic agricultural land
BTA	Bushfire Threat Assessment
CCTV	Closed-Circuit Television

Term / acronym	Description
CEMP	Construction Environmental Management Plan
CHL	Commonwealth Heritage List (items belonging to the Commonwealth or its agencies)
CIA	Cumulative Impact Assessment
CIS	Capacity Investment Scheme
CLM Act	Contaminated Land Management Act 1997 (NSW)
cm	centimetres
CNWG-R	Construction Noise and Vibration Guideline-Roads
CPESC	Certified Professionals in Erosion and Sediment Control
CPTED	Crime Prevention Through Environmental Design
Crown Land Management Act	*Crown Land Management Act 2016* (NSW)
CSEP	Community and Stakeholder Engagement Plan
CSP	Community Strategic Plan
CTMP	Construction Traffic Management Plan
CWCT	Central West Cycling Trail
CWO	Central West Orana
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Cth)
DCP	Development Control Plans
DECCW	Department of Environment, Climate Change and Water (NSW)
Development Footprint	The indicative developable area whereby Project infrastructure (including access tracks and temporary construction support areas) would occupy, covering approximately 1,600 hectares
DG	Dangerous goods
DNG	Derived native grassland
DPE	Department of Planning and Environment (now Department of Planning, Housing and Infrastructure) (NSW)
DPHI	Department of Planning, Housing and Infrastructure (NSW)
DPI	Department of Primary Industries (NSW)
Dubbo Regional LEP	Dubbo Regional Local Environmental Plan 2022
EDC	Estimated development cost
EIS	Environmental Impact Statement
ELF	Extremely Low Frequency
EMF	Electric and magnetic fields
EnergyCo	Energy Corporation of NSW
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EP&A Regulation	*Environmental Planning and Assessment Regulation 2021* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
EPC	Engineering, Procurement and Construction

Term / acronym	Description
EPI	Environmental Planning Instruments
EPL	Environment Protection Licence
ESC	Erosion and Sediment Control
ESCP	Erosion and Sediment Control Plan
ESD	Ecologically Sustainable Development
FFDI	Forest Fire Danger Index
FM Act	*Fisheries Management Act 1994* (NSW)
FRNSW	Fire and Rescue NSW
FTE	Full-time-equivalent
GDE	Groundwater Dependent Ecosystem
GHG	Greenhouse Gas
GIS	Geographic information systems
GW	gigawatts
ha	hectare
HBT	Hollow bearing tree
Heritage Act	*Heritage Act 1977* (NSW)
HHAR	Historic Heritage Assessment Report
HHMP	Historic Heritage Management Plan
High voltage	HV
HIPAP 4	Hazardous Industry Planning Advisory Paper No. 4 – Risk criteria for land use planning
HIPAP 6	Hazardous Industry Planning Advisory Paper No. 6 – Guideline for Hazard Analysis
IAP2	International Association of Public Participation
ICNG	Interim Construction Noise Guideline (DECC, 2009)
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IER	Index of Economic Resources
ILUA	Indigenous Land Use Agreements
IRSAD	Index of Relative Socio-economic Advantage and Disadvantage
ISP	Integrated System Plan
km	kilometres
kV	kilovolt
kW/m2	kilowatt per square metre
LALC	Local Aboriginal Land Council
LCA	Land Category Assessment
LCZ	Landscape Character Zone
LEP	Local Environmental Plan
LERP	Long-Term Emissions Reduction Plan

Term / acronym	Description
LGA	Local Government Area
LSC	Land and Soil Capability
LSC Scheme	Land and Soil Capability Assessment Scheme
LUCRA	Land Use Conflict Risk Assessment
LVIA	Landscape and Visual Impact Assessment
m	metres
mAHD	metres with respect to Australian Height Datum
Marble Energy	Marble Energy Pty Ltd (the original developer)
mG	milligauss
ML	megalitre
MLRA	Multilevel Risk Assessment
mm	millimetres
MNES	Matters of National Environmental Significance
MPa	MegaPascals
MW	megawatts
MWh	megawatt-hour
NEM	National Electricity Market
NHL	National Heritage List (items of significance to the nation)
NMLs	Noise management levels
NPfI	NSW Noise Policy for Industry
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NSW	New South Wales
NSW EPA	NSW Environment Protection Authority
NSWALC	NSW Aboriginal Land Council
NT Act	*Native Title Act 1993* (Cth)
NVIA	Noise and Vibration Impact Assessment
NVR	Native Vegetation Regulatory
ODP	Optimal Development Path
OEH	Office of Environment and Heritage
OEMP	Operation Environmental Management Plan
OOWH	Out of work hours
OSOM	Over Size Over Mass
PAD	Potential Archaeological Deposit
PCT	Plant Community Type
PCU	Power conversion unit
PHA	Preliminary Hazard Analysis
Planning Systems SEPP	*State Environmental Planning Policy (Planning Systems) 2021* (NSW)

Term / acronym	Description
PM10	Fine particles less than 10 micrometres in diameter
PM2.5	Fine particles less than 2.5 micrometres in diameter
PMF	Probable Maximum Flood
PMST	Protected Matters Search Tool
POEO Act	*Protection of the Environment Operations Act 1997* (NSW)
POEO Waste Regulation	*Protection of the Environment Operations (Waste) Regulation 2014* (NSW)
Project	Construction, operation and decommissioning of the Cobbora Solar Farm. The Cobbora Solar Farm would be a large-scale solar photovoltaic (PV) generation facility and BESS with associated infrastructure
Project Area	Extends over approximately 21 land parcels and covers approximately 3,000 hectares
Proponent	Cobbora Solar Farm Pty Ltd, in its capacity as trustee for the Cobbora Solar Farm Trust (a wholly owned subsidiary of Pacific Partnerships Pty Ltd)
PV	photovoltaic
RAP	Registered Aboriginal Party
RBL	Rating background level
Resilience and Hazards SEPP	*State Environmental Planning Policy (Resilience and Hazards) 2021* (NSW)
RET	Renewable Energy Target
REZ	Renewable Energy Zone
RFS	NSW Rural Fire Service
RNE	Register of the National Estate
Roads Act	Roads Act 1993 (NSW)
SCADA	Supervisory Control and Data Acquisition
SEARs	Secretary's Environmental Assessment Requirements
SEED	Sharing and Enabling Environmental Data
SEIFA	Socio-Economic Index for Areas
SEPP	State Environmental Planning Policy
SIA	Social Impact Assessment
SIA Guideline	Social Impact Assessment Guideline for State Significant Projects
Solar Guidelines	Large-Scale Solar Energy Guidelines (DPHI, 2024d)
SSAL	State Significant Agricultural Land
SSD	State Significant Development
SSDA	State Significant Development Application
SSO	Strahler Stream Order
SWL	Standing Water Level
SWMP	Soil and Water Management Plan

Term / acronym	Description
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened ecological community
Transport and Infrastructure SEPP	*State Environmental Planning Policy (Transport and Infrastructure) 2021* (NSW)
TSP	Total suspended particles
V/m	Volts per metre
VPA	Voluntary Planning Agreement
WAL	Water Access Licence
WaQI	Water Quality Index
WARR Act	*Waste Avoidance and Resource Recovery Act 2001* (NSW)
Warrumbungle LEP	*Warrumbungle Local Environmental Plan 2013*
Waste Classification Guidelines	Waste Classification Guidelines 2014 (NSW EPA, 2014b)
WM Act	*Water Management Act 2000* (NSW)
WMP	Waste Management Plan
WRPA	Water Resource Area
WSP	Water Sharing Plans

1.0 Introduction

The project described in this Environmental Impact Statement is referred to as Cobbora Solar Farm. During community engagement activities in late 2024, some community members made a request to rename the Project (**Chapter 5.0 Stakeholder and community engagement**). Alternative project names are being considered through engagement with the local community and stakeholders. This process will continue, with a final project name to be determined at a future time with consideration of community inputs and consensus.

1.1 Overview

Cobbora Solar Farm Pty Ltd (the Proponent), in its capacity as trustee for the Cobbora Solar Farm Trust (a wholly owned subsidiary of Pacific Partnerships Pty Ltd) is seeking development consent to construct, operate and decommission the Cobbora Solar Farm in the central west region of New South Wales (NSW). The Project will include:

- A large-scale solar photovoltaic (PV) generation facility with the capacity to generate up to 700 megawatts (MW) (AC) of electricity from PV solar panels
- A 400 MW / 1,600 megawatt-hour (MWh) battery energy storage system (BESS)
- Associated infrastructure for the management and connection of the Project to the national electricity market (NEM)

The Project will be located near Cobbora, approximately 20 kilometres (km) southwest of the township of Dunedoo and 55 km east of Dubbo in the Central West Region of NSW (the Project Area), as shown in **Figure 1-1**.

The Project will connect to the Central West Orana (CWO) Renewable Energy Zone (REZ) grid infrastructure via up to four onsite grid substations connecting to the Elong Elong Energy Hub.

This Environmental Impact Statement (EIS) has been prepared by AECOM Australia Pty Ltd (AECOM) on behalf of the Proponent to support an application for development consent under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The Project is classified as State Significant Development (SSD) under the EP&A Act meets the definition of 'electricity generating works' and will also have an estimated development cost of more than $30 million in accordance with Schedule 1 of the *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP).

The purpose of this EIS is to provide a detailed description of the Project, including a description of the existing environment and an assessment of its potential direct, indirect and cumulative impacts, and the nature of community and stakeholder consultation undertaken. This EIS also identifies measures and strategies to be implemented to avoid, minimise, mitigate, offset and/or monitor potential impacts.

This EIS has been prepared to address the Planning Secretary's Environmental Assessment Requirements (SEARs) issued by the Secretary on 7 November 2024. These have been summarised in **Appendix A (SEARs Table)**. The Project was referred under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (EPBC Ref: 2022/09269) and was determined to be a Controlled Action on 29 September 2022. As a result of this, Supplementary SEARs were issued detailing the requirements of the Australian Government for the EIS. As such, in addition to the SEARs (State), this EIS has been prepared to also address the Supplementary SEARs (Commonwealth).

This EIS has also been prepared in accordance with the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation), and the following guidelines:

- 'NSW Government *State Significant Development Guidelines – Appendix B – preparing an Environmental Impact Statement*' (DPIE, 2022b)
- *Undertaking Engagement Guidelines for State Significant Projects* (DPHI, 2024)
- *Large-scale Solar Energy Guideline* (DPHI, 2024d)
- Other relevant guidelines, as outlined in **Chapter 2.0 Strategic context**.

The Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) has created a National Renewable Energy List (Priority List), which will provide coordinated support for regulatory planning and environmental approval processes for identified priority renewable energy projects across Australia. DCCEEW identified Cobbora Solar Farm as a priority renewable energy project and, as such, the Project has been placed on the Priority List.

1.2 The Applicant

Pacific Partnerships is a leading infrastructure developer with a proven track record as an active developer, equity investor and asset manager. Pacific Partnerships Pty Ltd, a wholly owned subsidiary of CIMIC Group Limited ("CIMIC"), leads CIMIC's integrated development, financing, and delivery capabilities in the energy sector. Pacific Partnerships' expertise is being leveraged to develop and deliver CIMIC's renewable energy projects such as the Cobbora Solar Farm.

CIMIC is the largest diversified infrastructure developer in Australia and has been involved in the delivery of over 30 privately financed infrastructure projects during the past 25 years. CIMIC is committed to supporting Australia's energy transition, with Pacific Partnerships serving as a dependable developer, investor, and manager in this effort.

In June 2024, Pacific Partnerships acquired the development rights for the Project from Marble Energy Pty Ltd (Marble Energy). As such, Pacific Partnerships is the applicant seeking development consent for SSD-29491142.

Table 1-1 Applicant details

Item	Details
Applicant name	Cobbora Solar Farm Pty Ltd in its capacity as trustee for the Cobbora Solar Farm Trust
ABN	85 601 328 741
ACN	677 012 038
Address	Level 25, 177 Pacific Highway, North Sydney, NSW, 2060

1.3 The Project

1.3.1 Background to the Project

The NSW Electricity Strategy (DPIE, 2019) is the NSW Government's plan for reliable, affordable and sustainable electricity. This Strategy provides for Australia's first REZ in the CWO region. REZs are the equivalent of modern-day power stations and combine new renewable energy infrastructure, including generators (such as solar and wind farms), storage (such as batteries and pumped hydro), and high-voltage transmission infrastructure (EnergyCo, 2024b).

The NSW Government expects the CWO REZ to provide at least 4.5 gigawatts (GW) of new network capacity by the late 2020s (which is equivalent to powering 1.8 million homes) and around 6 GW by 2038. To support the CWO REZ, EnergyCo has gained approval to construct 240 km of transmission lines and supporting infrastructure.

In 2021, Marble Energy Pty Ltd (Marble Energy) lodged a Scoping Report (EMM, 2021) to support a request for the SEARs for a solar farm with a capacity of up to 700 MW AC. This project included a centralised 200 MW / 200 MWh BESS. The Project (as it was described in the 2021 Scoping Report and as it is described in this EIS) aligns with the NSW and Commonwealth Government's objectives for energy security, reliability and emissions reductions and will contribute to the continued growth of renewable energy generation and storage capacity in the CWO REZ.

The Project's original SEARs were issued by the Department of Planning and Environment (DPE) (now Department of Planning, Housing and Infrastructure (DPHI)) on 11 November 2021. Those SEARs have now expired, and two extensions to the SEARs have since been requested and issued on 16 October 2023 and 7 November 2024, respectively. As part of the 2024 extension, the Project also proposed an increase to the BESS size from 200MW / 200MWh to 800 MW / 3200 MWh. As discussed in **Chapter 3.0 Project Description**, the Project is only seeking a 400 MW / 1,600 MWh BESS.

Supplementary SEARs were issued on 29 September 2022, detailing the EPBC Act requirements for the EIS. Further, since the Scoping Report was developed, the *Large-scale Solar Energy Guideline* (DPHI, 2024d) has now come into effect, replacing the 2018 *Large Scale Solar Energy Guideline* (DPIE, 2018). As such, this EIS has been developed with consideration for the updated *Large-Scale Solar Energy Guideline* (DPHI, 2024d).

Following receipt of the SEARs, Supplementary SEARs and extension, the Project has continued to be developed and refined. A range of strategies have been employed throughout the Project's conception and development to avoid, minimise, and offset potential impacts. These include:

- **Project Area selection:** selection of the Project Area was conducted with a focus on minimising impacts to sensitive receivers and the environment. The selected site covers part of the area that was previously approved for the Cobbora Coal Project, an open-cut coal mine proposed by Cobbora Holding Company Pty Limited, a state-owned entity.
- **Re-siting of the Development Footprint:** based on early consideration of impacts, substantial effort has been focused on re-siting the Development Footprint (the potential disturbance footprint) to avoid areas of higher environmental value. This has focused particularly on avoiding areas of high biodiversity and Aboriginal heritage sensitivity.

1.3.2 Project objectives

The objectives of the Project are:

- to develop a viable, utility-scale solar energy plant to deliver low-cost, low-carbon, renewable energy for the benefit of all energy users within the NEM
- to provide firming capability to support existing and new renewable energy projects in the CWO REZ and throughout the Australian NEM
- to reduce the greenhouse gas (GHG) emissions arising from the NEM for the benefit of all Australians
- to assist the NSW and Commonwealth governments in meeting Australia's renewable energy targets and other national and international energy and climate change action goals
- to deliver economic benefits to the local region, including the provision of social and economic benefits to both the local community and surrounding region throughout the Project's construction and ongoing operation.

The Proponent will continue to engage meaningfully with the local community and government to shape a Project that is suitable for the region and enhances opportunities for regional investment, economic development, employment and other social benefits. The Proponent aims to design, construct and operate the Project in such a way that adverse local and regional environmental and social impacts are avoided and minimised as far as practicable, while beneficial outcomes are promoted and enhanced.

1.3.3 Key features of the Project

Key features of the Project will include:

- Construction and operation of a 700 MW (AC) solar farm
- Installation of a 400 MW / 1,600 MWh BESS
- Installation of up to four substations, comprising:
  - One substation connecting the BESS to the Elong Elong Energy Hub
  - Up to three substations connecting the solar farm to the Elong Elong Energy Hub (four potential substation locations have been assessed in this EIS, which will be reduced during detailed design).

Key supporting development and infrastructure components will include:

- internal roads
- upgrades to external access roads, if required

- underground and overhead cabling
- waterway crossings
- staff office
- meeting facilities
- operations and control room
- workshop
- amenities
- accommodation
- car parking
- storage facilities
- fencing and landscaping.

The Project for which development consent is sought is fully described in **Chapter 3.0 Project description**.

1.4 Project location and description

1.4.1 Regional context

The Project Area is approximately 6 km southwest of the township of Cobbora within the Central West Region of NSW. The Project Area is located within both the Warrumbungle Local Government Area (LGA) and the Dubbo Regional LGA. Using the 2021 census data (ABS, 2021), nearby town centres in the vicinity of the Project Area are detailed below:

- Cobbora (population 25), approximately 6 km northeast
- Elong Elong (population 142), approximately 13 km west
- Dunedoo (population 1,097), approximately 20 km northeast
- Gulgong (population 2,680), approximately 30 km southeast
- Mudgee (population 11,457), approximately 50 km southeast
- Wellington (population 4,096), approximately 50 km southwest
- Dubbo (population 43,516), approximately 55 km west.

Key land uses in the local and broader region include:

- Agriculture, consisting primarily of sheep and cattle grazing and dry land cropping,
- Mining
- Viticulture
- Production forestry, located within the broader region (in the vicinity of Gulgong and Mudgee).

Yarrobil National Park is located approximately 15 km southeast of the Project Area and the Goulburn River National Park is located approximately 50 km to the east. Other environmental conservation areas near the Project Area include Dapper Nature Reserve, and Cobbora, Goodiman and Goonoo State Conservation areas (refer to **Figure 1-1**).

Renewable energy development is a growing land use in the area. Several other proposed, approved, under construction and operational renewable energy developments are located within and near the CWO REZ. Potential cumulative impacts associated with the Project and nearby projects are also assessed in **Section 6.15**.

1.4.2 The Project Area

The Project Area extends across 21 land parcels (provided in **Table 1-2**) and covers an area of approximately 3,000 hectares (ha) (refer to **Figure 1-2**). The Development Footprint is the actual disturbance area (ie Project infrastructure, access tracks and temporary construction support areas) and is approximately 1,600 ha (discussed in **Section 1.4.3** below).

The Project Area is mostly located across land zoned RU1 Primary Production under both the *Dubbo Regional Local Environmental Plan 2022* (Dubbo Regional LEP) and the *Warrumbungle Local Environmental Plan 2013* (Warrumbungle LEP). A small portion of land at the northern end of the Project Area is zoned as UL Unzoned Land under the Warrumbungle LEP. The Project will be developed on predominantly freehold land, with the exception of:

- Danabar Road
- Sections of Sandy Creek Road, Tallawonga Road and Sweeneys Lane
- Small parcels of Crown land (for which an access / licence agreement will be negotiated).

The land tenure of the Project Area and surrounding land is shown in **Figure 1-2**.

There are four abandoned and dilapidated dwellings in the northern portion of the Project Area and a house, large shed and cattle yards in the south of the Project Area. These will be demolished to allow for the placement of the proposed solar array.

Road access to the Project Area is via the Golden Highway and Spring Ridge Road (discussed further in **Section 3.2.3**). Internal access roads will be provided within and between the various array areas. Local roads within the Project Area, including Danabar Road, Sandy Creek Road, and Sweeneys Lane, will not be used by the Project during construction except where crossing is required. These local roads experience minimal traffic and are primarily used as access routes for rural properties. These roads will remain open and available for public use throughout the construction and operation of the Project.

The Central Ranges gas pipeline aligns with a small section of the Project Area's north-western boundary. The Project has been designed to avoid this asset and its associated buffer area.

Remnant native vegetation is present across some portions of the Project Area. Several ephemeral watercourses associated with the Talbragar River are present within the Project Area and follow a generally north or north-westerly direction, including Sandy Creek and Laheys Creek (refer to **Figure 1-2**). Multiple farm dams are also present within the Project Area.

Table 1-2 Schedule of lands for the Project Area

Plan Label	Lot Number	Street Address
Associated landowner 1		
DP1238586	110	2475 Golden Highway Dunedoo NSW 2844
DP1238586	112	9 Sandy Creek Road Cobbora NSW 2844
DP652054	1	Sandy Creek Road Cobbora 2844
DP754289	21	
DP754289	31	
DP754289	35	
DP754289	38	
DP754317	17	445 Sweeneys Lane Elong Elong NSW 2831
DP754317	31	
DP754317	40	
DP754317	60	
DP754317	70	

Plan Label	Lot Number	Street Address
Associated landowner 2		
DP532844	1	1050 Spring Ridge Road Cobbora NSW 2844
DP754305	22	
DP754305	39	
DP754305	105	
DP754305	106	
DP754305	107	
DP754305	112	
Crown land		
DP1152415	7302	530 Sweeneys Lane Goolma NSW 2852
DP257066	46	N/A

1.4.3 The Development Footprint

The Development Footprint refers to the Project's footprint of potential disturbance. The Development Footprint is a subset of the Project Area and covers approximately 1,600 ha (refer to **Figure 1-3**). The Development Footprint comprises the key features of the Project and key supporting development and infrastructure components (as described in **Section 1.3.3**).

Following the initial site selection for the Project, environmental constraints were considered during the development of the general arrangement for the solar farm infrastructure. When developing the general arrangement, exclusion zones were designated for the following elements:

- Large contiguous vegetated areas
- Previously identified Aboriginal heritage sites and potential archaeological deposits
- Areas subject to flooding of a 0.01% Annual Exceedance Probability (AEP).

Other landscape features taken into consideration when developing the general arrangement plan included:

- Waterways (notably, Laheys Creek, which runs through the middle of the Project Area)
- Local roads that traverse the Project Area
- Nearby residential houses and associated buildings or infrastructure
- Existing utilities (including the Central Ranges high-pressure gas pipeline).

The remaining land was identified as the indicative 'developable area' for the Project. This developable area was then used to design the layout of the solar farm infrastructure, forming the general arrangement plan (**Figure 1-3**).

1.4.4 Related development

EnergyCo was appointed as the Infrastructure Planner for the CWO REZ as part of a declaration under the *Electricity Infrastructure Investment Act 2020*. The Elong Elong Energy Hub (and associated infrastructure) was subject to a separate approval (SSI- 48323210), which was determined on 27 June 2024. The Project will connect to the Elong Elong Energy Hub, which is located adjacent to the Project Area.

AECOM

N

0 3 6 km

Legend

- Project Area
- Local government area
- State forest
- National parks and reserves
- Waterbody
- Watercourses
- Motorway
- Main road
- Railway

FIGURE 1-1: REGIONAL CONTEXT

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AECOM

N

0 1 2 km

Legend

- Project Area
- Cadastral boundary
- Local government area
- Waterbody
- Watercourses
- Motorway
- Main road

FIGURE 1-2: THE PROJECT AREA

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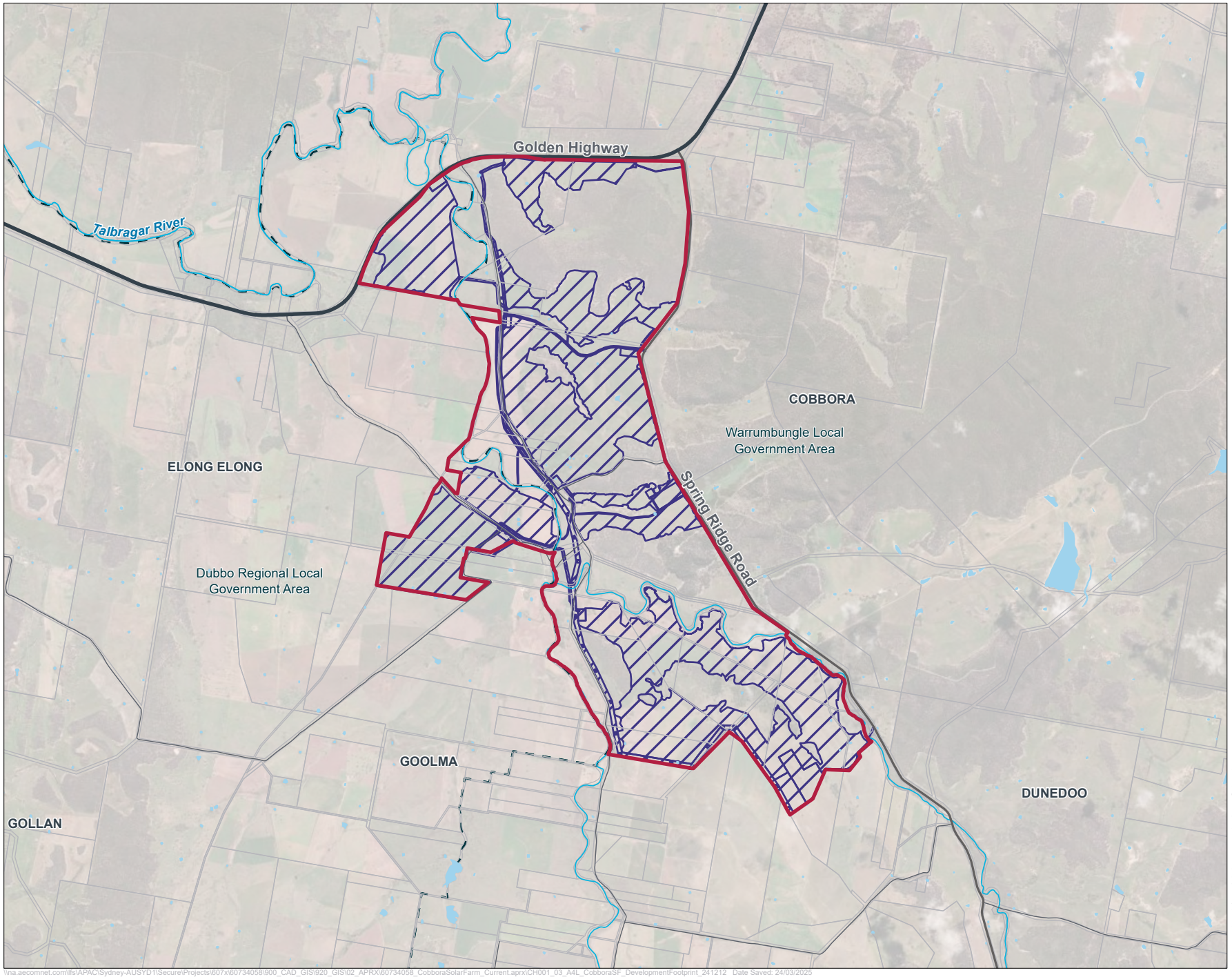

AECOM

N

0 1 2 km

Legend

- Project Area
- Development Footprint
- Waterbody
- Local government area
- Watercourses
- Motorway
- Main road

FIGURE 1-3: THE DEVELOPMENT FOOTPRINT

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Source: Earthstar Geographics

1.5 Structure of this environmental impact statement

This EIS has been prepared in accordance with the NSW Government State significant development guidelines – Appendix B – *preparing an environmental impact statement* (DPIE, 2022b). The structure of the EIS follows that outlined by the above guideline and is outlined in **Table 1-3**.

Table 1-3 Structure and content of the EIS

Chapter	Description
Summary	Concise description of the proposed works, environmental assessments, and findings of the EIS
Chapter 1.0 Introduction	Provides a brief description of the Project and relevant background information
Chapter 2.0 Strategic context	Provides the strategic context and explains the need for the Project
Chapter 3.0 Project description	Provides a summary of the Project, including the key components of the Project, design requirements and alignments
Chapter 4.0 Statutory context	Outlines the statutory requirements and approvals required to support the Project
Chapter 5.0 Stakeholder and community engagement	Outlines the consultation activities undertaken to date, key issues raised and how these have been addressed
Chapter 6.0 Assessment of impacts	Provides the results of the environmental assessments and outlines appropriate mitigation measures.
Chapter 7.0 Justification of the Project	Provides a conclusion to the EIS, including justification for the Project and whether the Project achieves the objectives
Chapter 8.0 References	Summarises the supporting material that was referenced in preparing this EIS

The EIS is supported by several appendices, which are listed in **Table 1-4**.

Table 1-4 Supporting material

Appendix	Description
Appendix A – SEARs Table	Supporting studies and information for the assessment of Project alternatives
Appendix B – Detailed Maps and Plans	Provides supporting detailed maps and plans for the Project
Appendix C – Statutory Compliance Table	Identifies all relevant statutory requirements for the Project and indicates where they have been addressed
Appendix D – Community Engagement Materials	Provides community notification material used throughout engagement activities
Appendix E – Compilation of Mitigation Measures	Table that provides a list of proposed mitigation measures to reduce potential impacts
Appendix F – Landscape and Visual Impact Assessment	Technical report providing a detailed analysis of the existing landscape character within the region and potential landscape and visual impacts, including a Glint and Glare assessment
Appendix G – Biodiversity Development Assessment Report	Technical report providing a detailed analysis of the biodiversity within the region and potential impacts
Appendix H – Traffic and Transport Impact Assessment	Technical report providing a detailed analysis of the traffic and transport within the region and potential impacts
Appendix I – Noise and Vibration Impact Assessment	Technical report providing a detailed analysis of the noise and vibration within the region and potential impacts

Appendix	Description
Appendix J – Social Impact Assessment	Technical report providing a detailed analysis of the social context within the region and potential impacts
Appendix K – Aboriginal Cultural Heritage Assessment Report	Technical report providing a detailed analysis of the Aboriginal heritage within the region and potential impacts
Appendix L – Historic Heritage Assessment Report	Technical report providing a detailed analysis of the non-Aboriginal heritage within the region and potential impacts
Appendix M – Preliminary Hazard Analysis	Technical report providing a detailed analysis of the potential hazards associated with the Project
Appendix N – Bushfire Threat Assessment	Technical report providing a detailed analysis of the bushfire risk within the region and potential impacts
Appendix O – Flood Impact Assessment	Technical report providing a detailed analysis of flooding within the region and potential impacts
Appendix P – Soils, Land and Agriculture Impact Assessment	Technical report providing a detailed analysis of the soil, land, and agriculture environment within the region and potential impacts, including a Land Use Conflict Risk Assessment (LUCRA) and Agrisolar Grazing Strategy
Appendix Q – Subdivision Plan	Table that provides the schedule of land within the Project Area

2.0 Strategic context

2.1 Project benefits

The Project is expected to provide benefits to the State and local community. Key benefits include:

- Contribution to NSW's energy supply
- Reduction of carbon emissions
- Direct investment in rural NSW.

These benefits are discussed in detail in **Sections 2.1.1**, **2.1.2**, and **2.1.3**.

2.1.1 Contribution to NSW's energy supply

A significant portion of the NEM's electricity generation comes from fossil fuel-based sources. In 2023, fossil fuels contributed to 65% of total electricity generation, including coal (46%), gas (17%) and oil (2%) (DCCEEW, 2024a). However, the energy landscape is changing. Since 2012, ten large coal-fired power stations have retired, with the most recent being AGL's Liddell Power Station (1.26 GW), which closed in April 2023. Retirements have been announced for all but one of the remaining coal-fired fleet, with approximately half expected to close by 2035 and the rest by 2051 (AEMO, 2024). The 2024 Integrated System Plan (ISP) (further described in **Section 2.3.10**) forecasts that the remaining coal fleet will close two to three times faster than those announcements (AEMO, 2024). Even under AEMO's 'Progressive Change' scenario (which reflects slower economic growth and energy investment), only 4 GW of coal generation will remain in 2034-2035 — less than 14% of the generation capacity that existed in 2009-10 (refer to **Plate 2-1**) (AEMO, 2024).

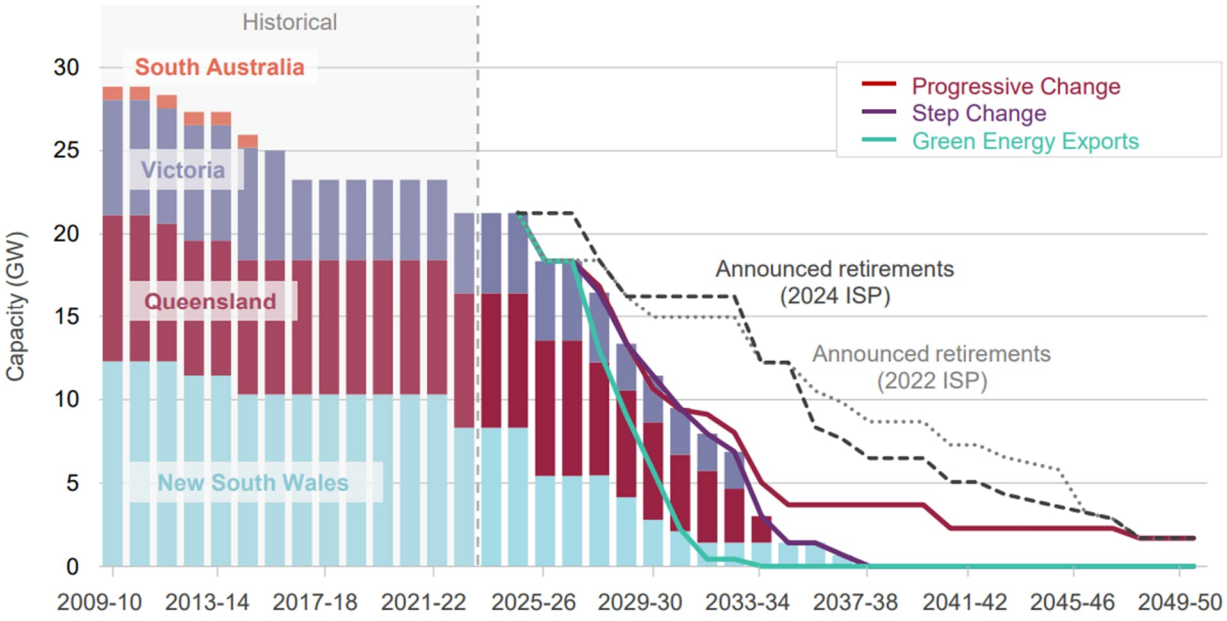


Plate 2-1 Coal capacity, NEM (2009-10 to 2049-50) (source: (AEMO, 2024))

This changing energy generation landscape highlights the importance of ensuring the security of supply into the future. It also presents a clear opportunity for decarbonising Australia's economy whilst contributing to Australia's international climate commitments around averting the catastrophic effects of climate change.

The Project will contribute to NSW's energy supply by generating up to 700 MW. By delivering renewable energy to the NEM, the Project will help to facilitate the transition from coal-fired power stations to renewables. In addition, integrating a BESS will enhance the reliability of the energy supply, allowing for the storage of excess energy produced during low-demand periods for use when demand is highest. This dual capability will not only support energy security but also facilitate a smoother transition to a more sustainable energy system.

2.1.2 Reduction of carbon emissions

Reducing carbon emissions is a critical component of the global effort to combat the catastrophic effects of climate change. This is the focus of numerous international and national commitments, supported by specific government plans and policies (see **Section 2.3**). Most notably, Australia has enacted legislation to achieve net-zero emissions by 2050, in line with the country's commitments to the Paris Agreement (AOFM, 2024).

This transition to an electricity system that is based primarily on renewable energy is essential for reducing Australia's overall carbon emissions. The Project will contribute to these targets by providing renewable energy that displaces the need for fossil fuel-based generation. Through the integration of a large-scale BESS, the Project will also contribute to energy reliability within the NEM.

2.1.3 Direct investment in rural NSW

The Project will involve approximately $1.38 billion in capital investment. Major investment costs are associated with the purchase of PV panels and associated equipment, battery storage components, and civil, electrical and grid connection works. The construction of the Project will create investments in local and regional economies, as well as flow-on benefits to local businesses and the local community.

The Project will also deliver direct economic benefit to the local area and the broader region through job creation. During the construction phase, which is anticipated to occur over a period of 47 months (including commissioning), up to approximately 734 workers will be employed during peak construction period. These jobs will boost the local economy by increasing demand for housing, food, and other services needed by construction workers.

Once operational, the Project will provide up to 20 full-time equivalent roles. The combination of temporary construction jobs and permanent operational roles will contribute to reducing unemployment and diversifying the local job market, offering new career pathways and promoting economic resilience in the area.

2.2 Project alternatives considered

The Proponent has considered various options to meet the Project's strategic needs and objectives. As part of the broader consideration of the constraints and opportunities present within the Project Area, the following alternatives were considered:

- Option 1: The 'do nothing' approach
- Option 2: Project Area location alternatives.

2.2.1 Option 1: The 'do nothing' option

The 'do nothing' option needs consideration as it maintains existing environment. Doing nothing will involve not constructing and operating the Project. This option will avoid potential impacts associated with the construction and operation of the Project and will retain the Project Area's agricultural land.

However, the 'do nothing' option will result in the Project's benefits not being realised. Specifically, the 'do nothing' option will neglect the opportunity to cover potential shortfalls in the supply of electricity as coal-fired power generation retires. This option will also neglect the opportunity to advance numerous state and federal strategies regarding the development of renewable energy and the reduction in GHG emissions.

The 'do nothing' scenario will also fail to fulfil the Proponent's objectives for the development. That is, it will not contribute to NSW's energy supply, reduce carbon emissions, or provide direct investment in rural NSW. As such, the 'do nothing' approach is not considered a feasible option.

2.2.2 Option 2: Project Area location alternatives

The Project Area has been selected within the CWO REZ, which was designated by the NSW Government based on a thorough statewide geospatial mapping exercise conducted in 2018 (EnergyCo, 2021). This analysis identified optimal locations for renewable energy generation, focusing on areas with strong resource potential, proximity to existing electrical infrastructure, and careful consideration of land use interactions, including agriculture and biodiversity conservation (EnergyCo, 2021).

The land that comprises the Project Area previously formed part of the Cobbora Coal Mine site. This land was compulsorily acquired by the NSW Government between 2009 and 2010 and received approval for an open cut coal mine in 2014. The Cobbora Coal Mine Project (Application number MP10_0001) was abandoned by the NSW Government in 2017, and the land was sold back to private landowners. While the Cobbora Coal mine project's inception and abandonment was disruptive for the region, the events that have unfolded have provided a unique prospect for the Proponent to develop the Project, which will have more community support and less environmental impact than the Cobbora Coal Mine project. It has been evident during consultations that the community is supportive of a solar farm project proceeding on the Project Area instead of a coal mine (refer to **Chapter 5.0 Stakeholder and community engagement**).

Through the detailed environmental information already available about the Project Area through the Cobbora Coal Mine project and several site visits, the Proponent confirmed that the Project Area is favourable for the development of a large-scale solar farm. The following site characteristics were observed:

- Favourable topography for solar farm construction
- No biophysical strategic agricultural land mapped on the Project Area
- Limited views of the Project Area from neighbouring properties
- Good access to the Project Area from a suitable road network capable of sustaining the volume and types of vehicles proposed for construction
- Favourable solar resource for generation.

In light of the above factors and given that the Project is situated within the CWO REZ, the Project Area is deemed highly suitable, and alternative sites were not considered necessary.

However, as described in **Section 1.4.3**, the Development Footprint (a subset of the Project Area) has undergone refinements to enhance its suitability. The solar array area has been adjusted to avoid large contiguous vegetated areas, Aboriginal heritage sites and PADs, and areas subject to flooding above 0.5 m during 0.01% AEP event. Other landscape features that the design has been refined to avoid include waterways, local roads, residential receivers, and existing utilities.

2.3 Consistency with government plans and policies

The construction and operation of the Cobbora Solar Farm will directly contribute to Australia's transition towards sustainable renewable energy sources, as described in **Section 2.1**. The development will align with numerous plans and policies at the Commonwealth, State, and regional levels. A summary of the relevant plans and policies the Project is consistent with is provided below.

2.3.1 United Nations Framework Convention on Climate Change (The Paris Agreement)

The *United Nations Framework Convention on Climate Change* (UNFCCC) Paris Agreement (the Paris Agreement) is an international agreement on addressing climate change. The main goal of the Paris Agreement is to limit global warming, by reducing greenhouse gas emissions to the atmosphere. Parties to this agreement are bound to meet the greenhouse gas emissions reductions set out in the Paris Agreement. Key to the implementation of the Paris Agreement is economic and social transformation, specifically developed countries providing financial assistance to those that require it, adopting technology that will improve climate change resilience and reduce greenhouse gas emissions, and capacity building.

As a Party to the Paris Agreement, the Australian Government codified the conditions of the Paris Agreement through the *Climate Change Act 2022* (the Climate Change Act). The Climate Change Act legislates the Australian Government's responsibility to reduce greenhouse gas emissions. Key goals within the Climate Change Act include a net greenhouse gas emissions reduction of 43% below 2005 levels by 2030, and net zero emissions by 2050. The strategic plan for reaching these goals is set out in Australia's *Long-Term Emissions Reduction Plan* (DISER, 2021). This plan takes a technology-led approach.

Renewable energy development is growing substantially in Australia, contributing towards the transition to a low carbon future and assisting with meeting Australia's net zero emissions goal under the Paris

Agreement. A key component renewable energy development in Australia (and to adopting an ultra-low emissions electricity network), is the development of solar energy generation. The Project will contribute to meeting Australia's commitments under the Paris Agreement by providing an alternative energy source to energy source from fossil fuels, thereby reducing the NEM's annual greenhouse gas emissions.

This Project will contribute up to 700 MW of clean renewable energy capacity to the NEM. This is fully aligned with the goals of the Paris Agreement.

2.3.2 Australia's Long-Term Emissions Reduction Plan

Australia's whole-of-economy *Long-Term Emissions Reduction Plan* (LERP) is a plan to achieve net zero emissions by 2050 (DISER, 2021). The LERP aims to achieve this in a practical, responsible way that takes advantage of new economic opportunities while continuing to serve traditional markets. The ALERP has a focus on technology and prioritises those that will help Australia cut emissions while creating jobs and growing Australia's economy.

The LERP focusses on the implementation of lower cost low emissions technologies, accelerating their deployment at scale, and positioning the economy to take advantage of new and traditional markets. It supports existing industries and workers to realise these benefits.

The Project will directly implement a proven emissions reduction technology that will also stimulate the local economy, create jobs, and incrementally reduce the price of electricity.

2.3.3 Net Zero Plan

The Net Zero Plan was developed by the Australian Government to guide the transition to the legislated target of net zero greenhouse gas emissions by 2050. The Net Zero Plan sets out government priorities, establishes policies and measures to drive down emissions and supports ongoing and new investment in low emissions and renewable activities.

The plan includes six sectoral emissions reduction plans that capture the full breadth of the economy: electricity and energy, transport, industry, agriculture and land, resources, and the built environment. The Net Zero Plan combines these plans with a whole of economy strategy to reach net zero as well as supporting the Government's ambition for a future made in Australia.

The Project supports the Net Zero Plan by reducing emissions in the electricity sector through renewable energy generation.

2.3.4 NSW Climate Change Policy Framework

At the COP21 climate talks in Paris in December 2015, the Australian Government committed to a GHG emissions reduction target of 26-28% by 2030, when compared to 2005 levels. Based on this target, the NSW Government developed the NSW Climate Change Policy Framework (OEH, 2016). This Framework outlines the NSW Government's long-term ambition to achieve net-zero emissions by 2050 and to make NSW more resilient to a changing climate.

The framework highlights the new opportunities in 'advanced energy' sectors that will help the world adapt to climate change. it also outlines the NSW Government commitment to support opportunities to grow these emerging industries in the State.

The goals of the framework are supported by the Project as the project will directly contribute to the State's net zero plan, as well as supporting long-term resilience to a changing climate.

2.3.5 NSW Net Zero Plan Stage 1: 2020–2030

The NSW Net Zero Plan Stage 1: 2020-2030 is the foundation for NSW's action on climate change, outlining how the state plans to reach net zero emissions by 2050. The priorities identified within this plan include:

- Drive uptake of proven emissions reduction technologies
- Empower consumers and businesses to make sustainable choices
- Invest in the next wave of emissions reduction innovation
- Ensure the NSW Government leads by example.

The implementation of the Net Zero Plan, together with the Electricity Infrastructure Roadmap (refer to **Section 2.3.8**), will result in more than 9,000 jobs and up to $37 billion in private investment, with the majority expected to be across regional NSW.

The Project will help meet the goals identified in the Net Zero Plan by contributing to the State's uptake of emissions reduction technologies as tangible action on climate change.

2.3.6 NSW Transmission Infrastructure Strategy 2018

The NSW Government recognises that a key challenge in the journey to net zero emissions is the provision of suitable capacity within the electricity grid is to facilitate the connection of the range of technologies that will drive the energy future of the state. The *NSW Transmission Infrastructure Strategy* (DPE, 2018) was developed to address this challenge and is underpinned by five driving principles:

- Lower energy bills for NSW households and businesses
- A technology neutral approach to new energy generation projects
- Private sector-led investment in transmission and generation
- Regional economic growth and increased job opportunities
- Ongoing secure and reliable energy to power the NSW economy.

The *NSW Transmission Infrastructure Strategy* sets out a plan to facilitate private sector investment in priority transmission infrastructure projects, which can deliver least-cost energy to customers by 2040 and beyond. The *NSW Transmission Infrastructure Strategy* forms part of the NSW Government's broader plan to make energy more affordable, secure investment in new power stations and network infrastructure, and ensure new technologies deliver benefits for consumers.

As part of the *NSW Transmission Infrastructure Strategy*, the NSW Government is seeking to increase energy generation and storage capacity by prioritising the development of renewable energy generation and storage within the CWO, Southwest and New England REZs. The REZs will play a key role in facilitating the delivery of new, affordable energy generation into the future. The *NSW Transmission Infrastructure Strategy* specifically notes the CWO REZ as an area with high energy potential and identifies it as a priority for renewable energy infrastructure upgrades.

The Project strongly aligns with the five principles of the *NSW Transmission Infrastructure Strategy*. The Project harnesses a technology driven approach towards providing the generation of up to 700 MW plus storage of renewable energy to the CWO REZ. Together with other projects in the CWO REZ, the Project will contribute towards the delivery of low-cost, renewable energy to up to approximately 1.5 million homes, once fully operational (DPHI, 2024b). The construction and operation of the Project diversifies industry and will provide additional job opportunities in the Central West region.

2.3.7 NSW Electricity Strategy

The *NSW Electricity Strategy* (DPIE, 2019) is the NSW Government's plan for a reliable, affordable and sustainable electricity future that supports a growing economy. This strategy is designed to complement the NSW Transmission Infrastructure Strategy, and the work of the NEM bodies.

The sustainability of the NSW electricity system is identified as a key issue in the *NSW Electricity Strategy*. The electricity generation sector is the largest source of greenhouse gas emissions in the NSW economy, constituting 39% of NSW's total emissions (DPIE, 2019). The Project will assist in minimising greenhouse gas emissions from the NSW electricity sector by providing up to 700 MW of renewable energy for use in the NEM.

To assist in promoting investment in renewable energy projects in NSW, the *NSW Electricity Strategy* sets out a plan to deliver three REZs, including the CWO REZ. The establishment of the REZs will drive the coordination of new grid infrastructure in energy rich areas, efficiently connecting multiple generators in the same location. The REZs will increase energy network efficiency by combining energy generation, transmission, storage and system strength services at the same location. They will also boost regional economies and improve resilience of the energy network by ensuring there are new generation projects coming online to replace retiring fossil fuel power stations. To support the

development of the REZs, the NSW Government is seeking to facilitate and support private sector investment in strategic infrastructure upgrades.

A key pathway within this strategy includes 'securing Australia's electricity future'. Actions under this strategic pathway include establishing new REZs and supporting new electricity generation in NSW. The Project will contribute towards the success of the CWO REZ and provide renewable energy generation and employment in the Central West region of NSW. Therefore, the Project is well aligned with the strategic and operational goals of the NSW Government's *NSW Electricity Strategy*.

2.3.8 NSW Electricity Infrastructure Roadmap

The *NSW Electricity Infrastructure Roadmap* builds on the foundations of the *NSW Electricity Strategy* (refer to **Section 2.3.7**). The *NSW Electricity Infrastructure Roadmap* seeks to coordinate investment in transmission, generation, storage and firming infrastructure as ageing coal-fired generation retires.

Key actions and priorities of the *NSW Electricity Infrastructure Roadmap* include:

- Development of REZs
- Implementation of the transmission development scheme
- Electricity Infrastructure Investment Safeguard
- Pumped Hydro Recoverable Grants Program
- Internationally competitive NSW industries.

The Project is consistent with the objectives of the *NSW Electricity Infrastructure Roadmap* and will contribute to the key action of 'development of REZs', by constructing and operating a solar farm in the CWO REZ.

2.3.9 Renewable Energy Target

The *Renewable Energy Target* (RET) is an Australian Government policy that commenced in 2001. The RET sets a target to deliver an extra 33,000 GWh of electricity from renewable sources every year from 2020 to 2030.

In September 2019, the Clean Energy Regulator announced that Australia had met the RET more than a year ahead of schedule. Despite this, the scheme will continue to require high-energy users to meet their obligations under the policy until 2030.

The development of the Cobbora Solar Farm will contribute to the Australian RET by increasing renewable energy within the NEM.

2.3.10 2024 Integrated System Plan

The 2024 Integrated System Plan (ISP) was published in June 2024 by the Australian Energy Market Operator (AEMO). The ISP is a 30-year roadmap for the efficient development of the NEM. Over this period the NEM will need to cater for significant investment in generation capacity, storage, firming and transmission augmentations as coal generation withdraws, which is retiring 'two to three times faster than anticipated' (refer to **Section 2.1.1**).

The ISP sets out an optimal development path (ODP) for reliability and affordability. The ODP comprises the following:

- Transition to renewable generation
- Actionable and other network investments
- Storage and gas to firm renewables.

The Project supports the ISP ODP by increasing renewable energy generation and storage within the NEM.

2.3.11 Capacity Investment Scheme

The Capacity Investment Scheme (CIS) is an initiative by the Australian Government designed to foster investment in renewable energy sources, such as wind and solar, and clean dispatchable capacity, such as battery storage.

The primary goals of the CIS are to deliver an additional 32 GW of capacity by 2030, fill reliability gaps as aging coal power stations are phased out, and achieve the target of 82% renewable electricity generation. The CIS aims to enhance reliability, affordability, and low-emission nature of the energy system, creating jobs and investment opportunities in regional communities while supporting First Nations peoples.

The Australian Government will provide revenue underwriting for successful CIS tender projects, with an agreed revenue 'floor' and 'ceiling'. This will provide a long-term revenue safety-net that decreases financial risks for investors and encourages more investment when and where it is needed.

It is the Proponent's intention to apply for the CIS.

2.3.12 Central West and Orana Regional Plan 2041

The Central West and Orana Regional Plan 2041 (the Regional Plan) is the five-year update to the Central West and Orana Regional Plan 2036. The Central West and Orana Regional Plan 2041 considers a 20-year timeframe, with a focus on the first five years.

Key areas of change included in the Regional Plan, which are relevant to the Project include:

- Supporting the State's transition to net zero carbon emissions through a broad range of actions, including the establishment of a REZ
- Responding to a changing regional economy and catalyst projects such as the CWO REZ to capitalise on opportunities.

The Regional Plan acknowledges that the future of energy production is renewable, and that the region is well suited for increased opportunities in renewable energy, including large-scale solar energy.

The Project will fulfil the requirements of the Regional Plan by supporting the State's transition to net zero carbon emissions through the establishment of a solar farm.

2.3.13 Warrumbungle Shire Council Community Strategic Plan 2022/2037

The Warrumbungle Shire Council Community Strategic Plan (CSP) 2022/2037 outlines what is most important to the area, along with aspirations for the future.

The CSP comprises four key themes, including 'Strengthening the Local Economy' and 'Caring for the Environment'.

The themes of the CSP will be supported by the Cobbora Solar Farm. The siting of the Project has been refined to minimise potential environmental impacts (as described in **Section 2.2**), and the broad environmental benefits associated with renewable energy are closely aligned with the theme of 'Caring for the Environment'. Further, as described in **Section 2.1.3**, the Project will provide up to 734 jobs during the construction phase, and approximately 20 full-time equivalent positions during operation. This demand for labour will benefit the local economy, aligning with the theme of 'Strengthening the Local Economy'.

2.3.14 'Towards 2040' Community Strategic Plan

Dubbo Regional Council's *'Towards 2040' Community Strategic Plan* (CSP) identifies the community's main aspirations and priorities for the future of the region through to 2040. Six key themes are discussed in the CSP, including:

- Theme 1: Housing
- Theme 2: Infrastructure
- Theme 3: Economy
- Theme 4: Leadership
- Theme 5: Liveability
- Theme 6: Environmental Sustainability.

The Project directly aligns with Theme 6 ‘Environmental Sustainability’. Specifically, subsections 6.1 and 6.1.1, which comprise ‘Achieve net zero emissions’ and ‘Invest in renewable energy opportunities’, respectively.

The Project will meet objectives and align with key strategies of the CSP by producing renewable energy that will directly contribute to Australia’s net zero target.

2.4 Key features of the Project Area and surrounds

Land use and zoning for the Project Area and surrounds is mapped under the Warrumbungle LEP and the Dubbo Regional LEP (refer to **Figure 2-1**). The nearest township to the Project is Cobbora, located about 7 km to the east.

2.4.1 Residential

The nearest residential receiver is located at 530 Sweeneys Lane, Goolma, approximately 50 m west of the Project Area boundary (as shown in **Figure 2-2**). The nearest residentially zoned land is located approximately 11 km east of the Project Area. Other residences are located along the Golden Highway, Spring Ridge Road, Dapper Road, Tallawonga Road and Sandy Creek Road. There are 31 receivers within 4 km of the Project Area.

2.4.2 Recreational and environmental land

There is no land zoned for recreational or environmental purposes within the Project Area. The nearest recreational zoned land is Talbragar River, approximately 16 km west of the Project Area. The Talbragar River is zoned as ‘W2 Recreational Waterway’ under the Dubbo Regional LEP.

The nearest environmental zoning is the Cobbora State Conservation Area, approximately 5.2 km north of the Project Area. This area is zoned as C1 National Parks and Nature Reserves under the Warrumbungle LEP.

The Project is not anticipated to affect recreational or environmental conservation land.

2.4.3 Agricultural land

Agriculture is the predominant land use in the Project Area, with land in and surrounding the Project Area characterised by undulating cleared land used primarily for sheep and cattle grazing or dryland cropping. The majority of the Project Area is zoned as RU1 Primary Production.

The verified LSC classes present within the Development Footprint are as follows:

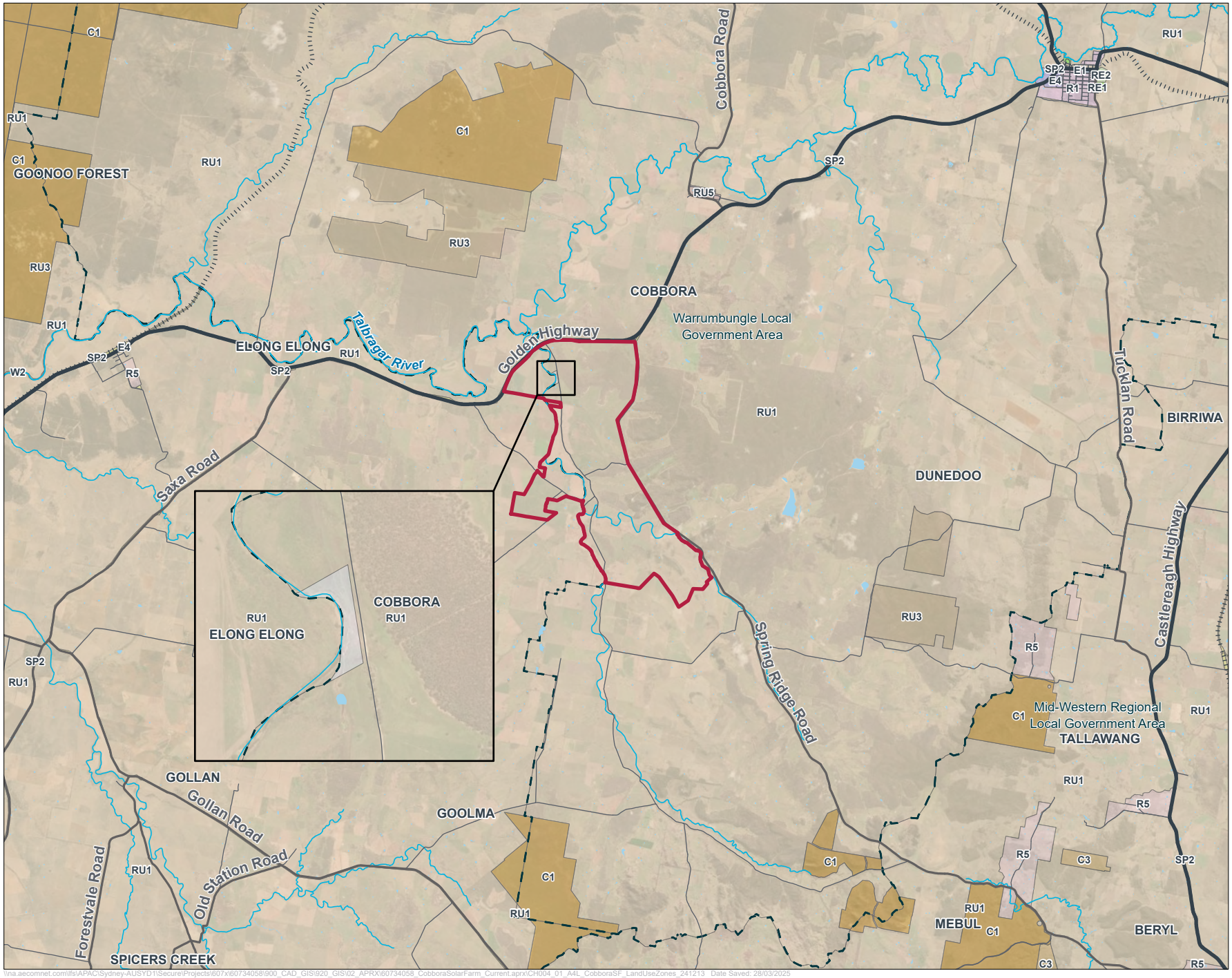
- LSC class 3: high capability land – covering 873 ha
- LSC class 4: moderate capability land – covering 437 ha
- LSC class 5: moderately low capability land – covering 298 ha.

Section 6.5 assesses potential impacts to agricultural land.

2.4.4 Key risks

A Flood Impact Assessment was prepared for the Project and is discussed in **Section 6.9**. The assessment identified that some flooding will occur around Sandy Creek and Laheys Creek within the Project Area in both 20% and 1% AEP flooding scenarios, but that flooding will be generally contained to the creek crossing where Golden Highway crosses Sandy Creek immediately north of the Project Area. However, LEP maps for both the Dubbo Regional and Warrumbungle Shire identified no flood prone land within the Project Area.

The Project Area is mapped as bushfire prone land which is defined as an area of land that can support a bushfire. Most of the Project Area is mapped as Category 2 (lowest risk), with pockets of Category 1 (highest risk) and Category 3 (moderate risk). Bushfire Threat Assessment (BTA) was prepared for the Project and is discussed in **Section 6.12**.



AECOM

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km
0 2 4

Legend

- Project Area
- Railway
- Motorway
- Main road
- Local road
- Watercourses
- Waterbody
- Local government area

Land Zoning

- C1 - National parks and nature reserves
- C3 - Environmental management
- E1 - Local centre
- E4 - General industrial
- R1 - General residential
- R5 - Large lot residential
- RE1 - Public recreation
- RE2 - Private recreation
- RU1 - Primary production
- RU3 - Forestry
- RU5 - Village
- SP2 - Infrastructure
- W2 - Recreational waterways

FIGURE 2-1: LAND USE ZONES

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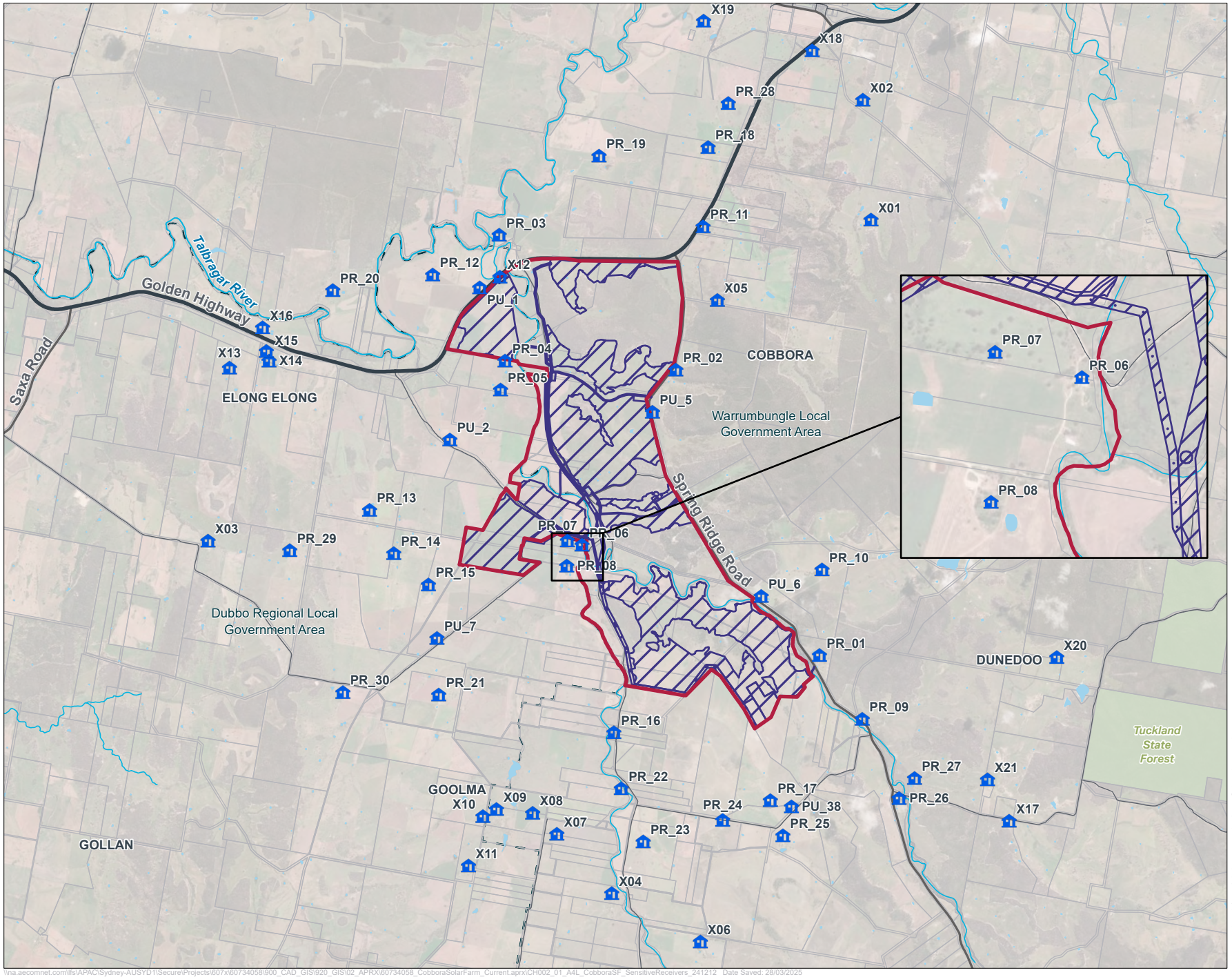

AECOM

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0 1 2 km

Legend

- Project Area
- Development Footprint
- State forest
- Waterbody
- Local government area
- Watercourses
- Motorway
- Main road
- Local road
- Sensitive receivers

FIGURE 2-2: SENSITIVE RECEIVERS SURROUNDING THE PROJECT

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2.5 Cumulative impacts

The Cumulative Impact Assessment (CIA) Guidelines for State Significant Projects (DPIE, 2022a) require consideration of the impacts of a project alongside those of other relevant future and existing projects to determine potential cumulative impacts. A detailed assessment of cumulative impacts has been undertaken in **Section 6.15**.

2.6 Agreements

2.6.1 Landowners

There is an option for lease agreement with the two associated landowners which will be exercised at financial close once all approvals are in place.

2.6.2 Other parties

The Proponent is in discussions with both Dubbo Regional and Warrumbungle Council for a Voluntary Planning Agreement (VPA). Details are being discussed in line with the Benefit-Sharing Guideline (DPHI, 2024a).

The Proponent is in the process of executing the access rights agreement in line with the Central-West Orana Renewable Energy Zone Access Rights Application Process Guidelines (EnergyCo, 2024a).

The Proponent will submit a Crown Land licence for the whole Project Area and will continue to work with Crown Land throughout the Project as required. The landowner of the southern portion of the Project Area has commenced the application process to permanently close some of the unformed Crown roads and purchase the subject land from Crown Lands. In addition to the roads to be closed, the Proponent will apply for a licence to construct permanent access tracks across both Sandy Creek and Laheys Creek.

3.0 Project description

3.1 Project overview

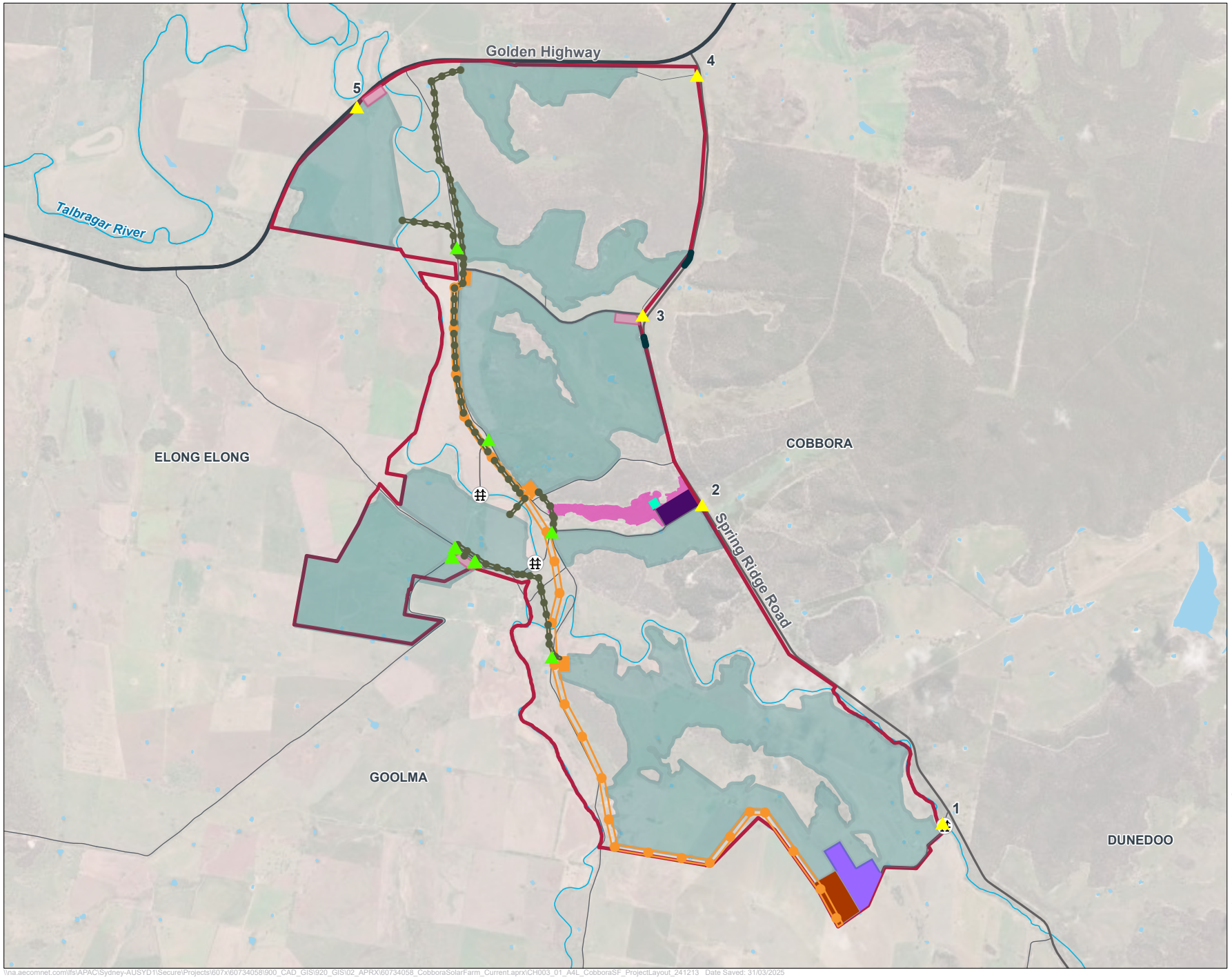
The Project involves the construction, operation and decommissioning of the Cobbora Solar Farm and BESS. The Project will connect to the CWO REZ grid infrastructure via the Elong Elong Energy Hub. The Elong Elong Energy Hub was approved as part of EnergyCo's Central-West Orana Renewable Energy Zone Transmission project EIS (EnergyCo, 2023) and is intended to connect renewable energy generators to the CWO REZ grid infrastructure.

Key features of the Project are summarised in **Table 3-1** and shown on **Figure 3-1**, with an indicative process flow diagram is shown on **Plate 3-1**. These features comprise the Project for which development consent is sought under this State Significant Development Application (SSD-29491142).

Table 3-1 Key features of the Project

Project	Cobbora Solar Farm
Key features	**Key infrastructure:** 700 MW AC solar farm, 400 MW / 1,600MWh BESS and up to four substations **Ancillary infrastructure:** Internal roads, waterway crossings, car parking, operation offices and control room, workshop, amenities, storage facilities, underground and overhead cabling, fencing and landscaping. **Temporary construction areas:** Compounds, laydowns, stockpiles, parking, helicopter landing site (emergencies only) and workforce accommodation.
Project location	Approximately 20 km south-west of Dunedoo and 55 km east of Dubbo in the CWO REZ.
Development Footprint	Approximately 1,600 ha and includes all disturbance areas (ie key infrastructure, ancillary infrastructure and temporary construction areas).
Access	Primary access will be via four access points along Spring Ridge Road and one on the Golden Highway.
Grid connection	Grid connection will be via up to four grid substations connecting to the Elong Elong Energy Hub.
Construction	**Expected duration:** 47 months (including commissioning) **Construction hours:** Standard working hours (EPA 2020) **Number of workers:** Up to 734 full-time-equivalent (FTE) workers during peak **Number of vehicles movements:** 14 light, 88 heavy and 2 OSOM (as required) per day and 34 shuttle bus per fortnight (two weeks) during peak.
Workforce accommodation	Around 9 ha in size and will accommodate the total maximum workforce required. By providing workforce accommodation, the Project seeks to limit pressure on the local housing market and nearby community services.
Operational	**Expected lifespan:** 35 years for the solar and 25 years for the BESS **Operational hours:** daylight hours, 7 days a week for the solar farm and 24 hours per day, 7 days a week for the BESS. If necessary, reactive or emergency maintenance may need to occur outside of standard working hours, however this is expected to be rare and will be appropriately notified to neighbouring properties affected by the works. **Number of workers:** 20 FTE workers

Project	Cobbora Solar Farm
Decommissioning and rehabilitation	At the end of the Project's operational life all above ground components will be removed and re-purposed where possible and land rehabilitated to achieve pre-existing conditions as far as reasonably practicable.
Estimated development cost (EDC)	$1.38 billion



AECOM

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Legend

- Project Area
- 33 kV easement
- 330 kV easement
- Solar array area
- Main construction area
- Construction areas
- Proposed tree planting locations
- BESS
- Accomodation camp
- Helipoint
- Secondary substations
- Roads
- Main substation
- Waterbody
- Motorway
- Main road
- Local road
- Watercourses
- Primary access point
- Secondary access point
- 33 kV poles
- 330 kV towers
- Proposed bridge crossings

FIGURE 3-1: PROJECT LAYOUT

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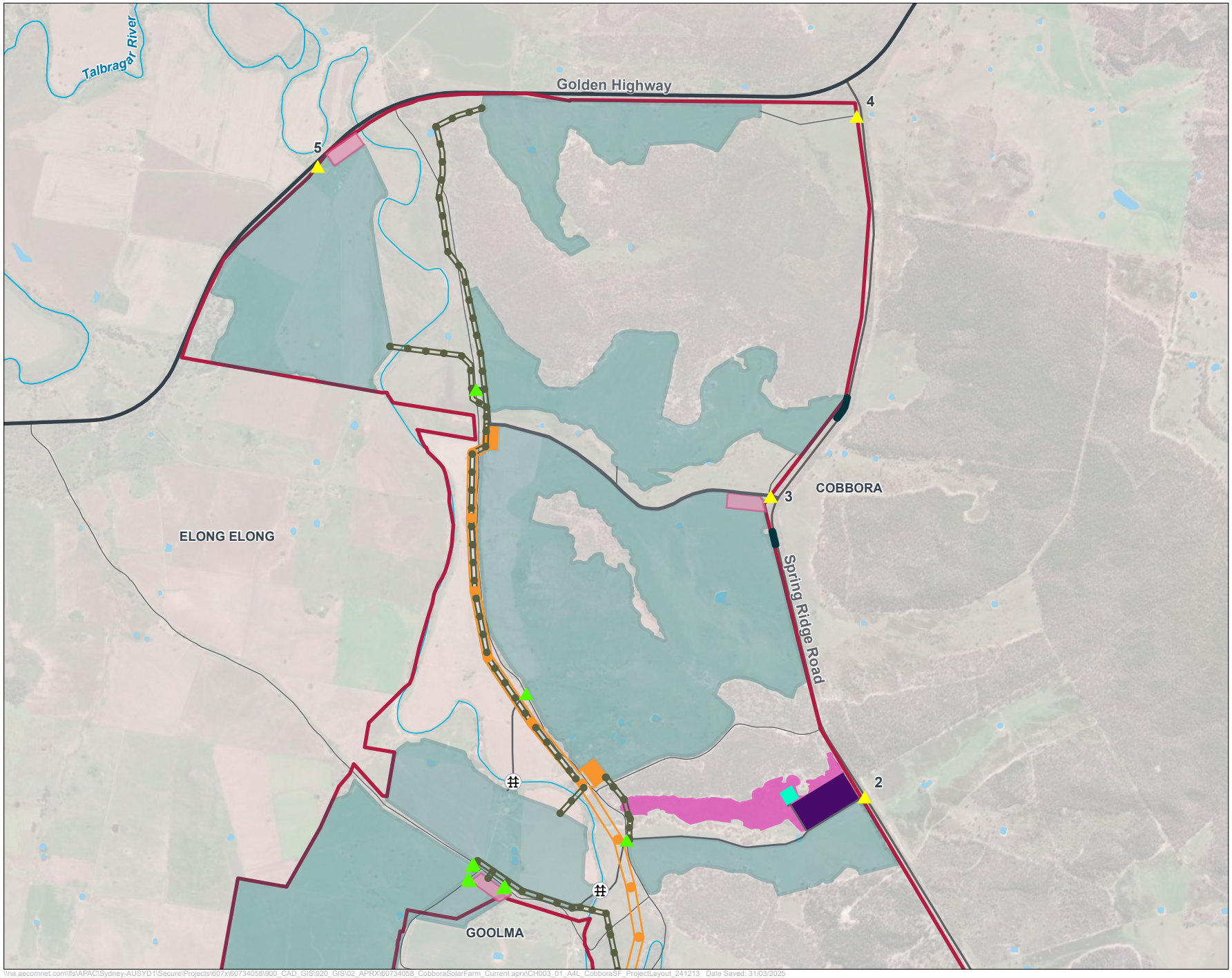

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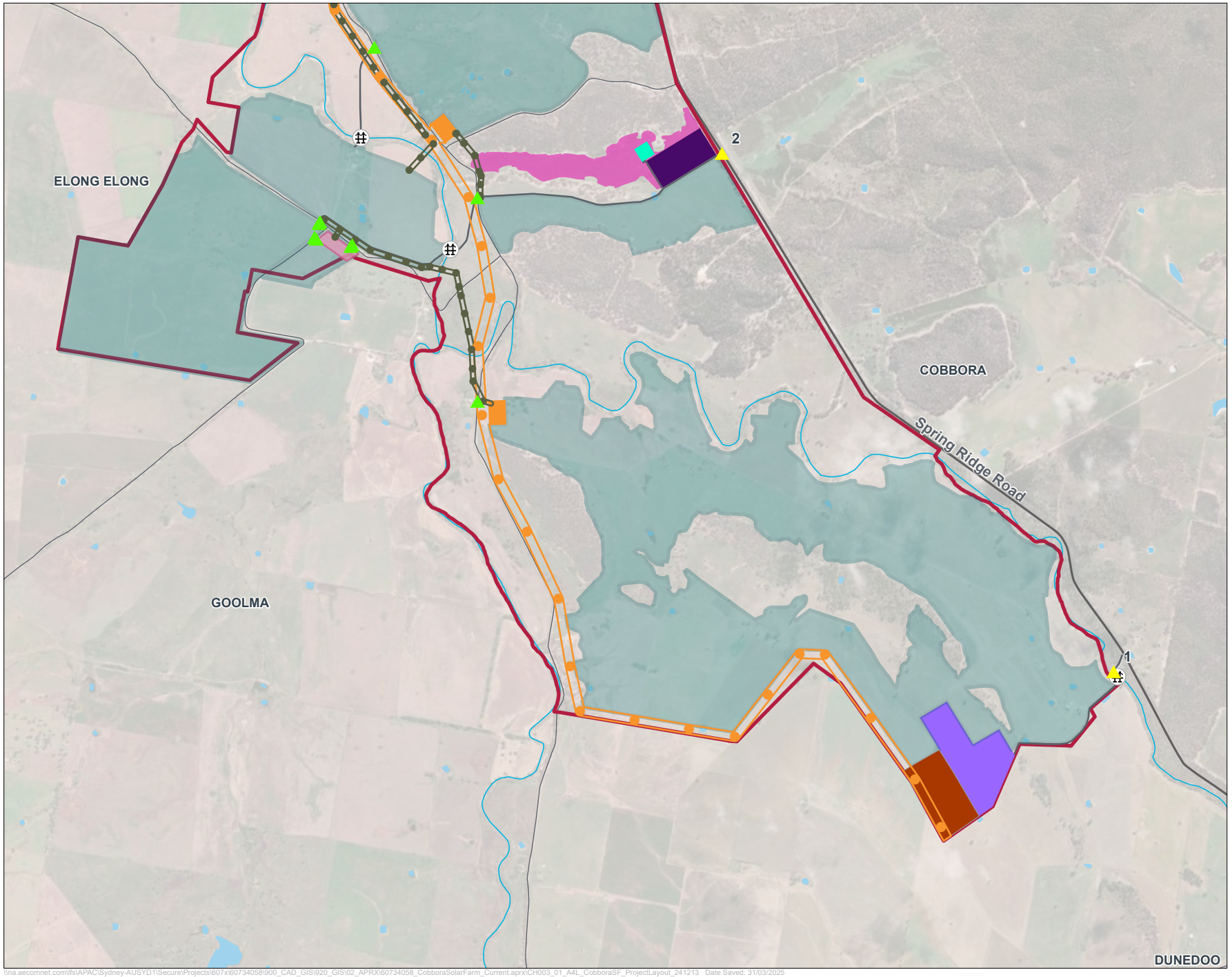

AECOM

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Legend

- Project Area
- 33 kV easement
- 330 kV easement
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- Helipoint
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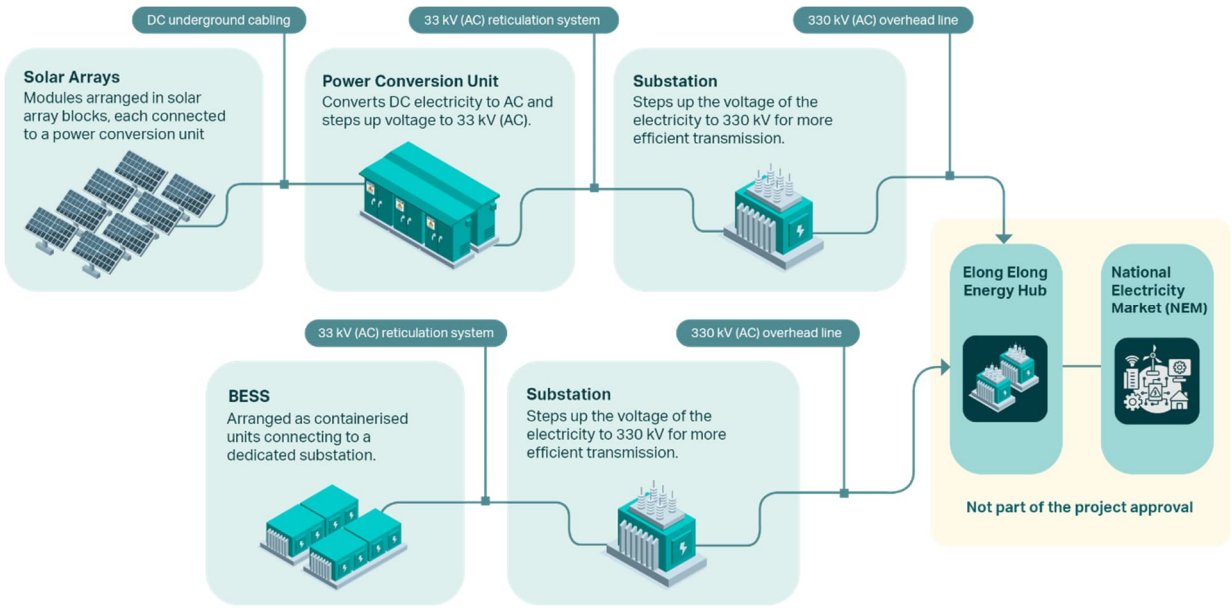


Plate 3-1 Indicative process flow diagram of Project components

3.2 Project description

3.2.1 Project boundaries

The Project is located approximately 20 km south-west of Dunedoo and 55 km east of Dubbo and spans two LGAs: Warrumbungle Shire LGA and Dubbo Regional LGA. A list to the specific lots subject to the Project are included in **Table 1-2**. The Project includes two key boundaries which are shown on **Figure 1-3**, being:

- **Development Footprint:** an area of approximately 1,600 ha which includes all disturbance areas (ie key infrastructure, ancillary infrastructure and temporary construction areas)
- **Project Area:** an area of approximately 3,000 ha which includes the Development Footprint, and buffer areas or areas with high environmental constraints which have been excluded to avoid disturbance.

Changes to components of the physical layout of the Project may occur during detailed design. The Project has assessed complete disturbance of the Development Footprint to capture potential changes to the layout. If physical components are changed to extend outside of the Development Footprint, additional assessment will be required.

3.2.2 Key infrastructure

Solar farm

The Project will involve the installation of approximately 1,320,000 PV solar panels, each being around 2.4 m by 1.3 m, and 3.5 centimetres (cm) thick. The final number of PV solar panels will be dependent on detailed design, the available technology, and the final grid capacity available at the time of finalising the connection agreement with NSW Government. It is anticipated the Project will utilise bifacial PV modules, which generate power from both sides of the panel.

The PV solar panels will be mounted on a single-axis tracking system, aligned in a north-south direction, to orient the panel to follow the sun from east to west each day. The tracking system will comprise galvanised steel racking frames fixed onto a horizontal tracker tube, with this mounted on top of vertical piles driven or screwed into the ground. These racks will be constructed in rows spaced between 5 m and 14 m apart, subject to final design (refer to **Plate 3-2**).

The configuration of the solar panels on the tracking system will be one of the following options:

- 'one-in-portrait' (1P) – this comprises a single row of solar panels orientated vertically. At maximum tilt, the higher edge of the panel will be about 3.0 m from the ground and the lower edge will be about 0.5 m from the ground (refer to **Figure 3-2**)
- 'two-in-portrait' (2P) – this comprises two vertical rows of solar panels are stacked on top of each other. At maximum tilt, the higher edge of the panel will be about 4.6 m from the ground and the lower edge will be about 0.5 m from the ground (refer to **Figure 3-2**)

The final mounting configuration will be determined during detailed design. For the purposes of assessing impacts a 'worst-case' scenario has been adopted for the respective assessments.

A solar farm is usually split into solar array blocks which comprise a multitude of interconnected solar panels to deliver a power output to a PCU (refer to **Plate 3-3**). The PV solar modules and trackers will be arranged into solar array blocks, each connected to a single PCU. Each PCU will be a containerised design, mounted on a concrete pad or piles. The PCUs are anticipated to be approximately 2.5 m tall and have a footprint of approximately 6.0 m by 2.5 m each (refer to **Plate 3-4**).

The PCUs comprise three main components:

- Inverters – converts the DC electricity generated by the PV modules into alternating current (AC)
- Transformers – step up the voltage of the electricity to 33 kV (AC) for transmission to a substation
- Ring main unit – connects electrical loads which can also control, protect and isolate electrical equipment.

Plate 3-2 PV module layout (source: Pacific Partnerships, 2025)

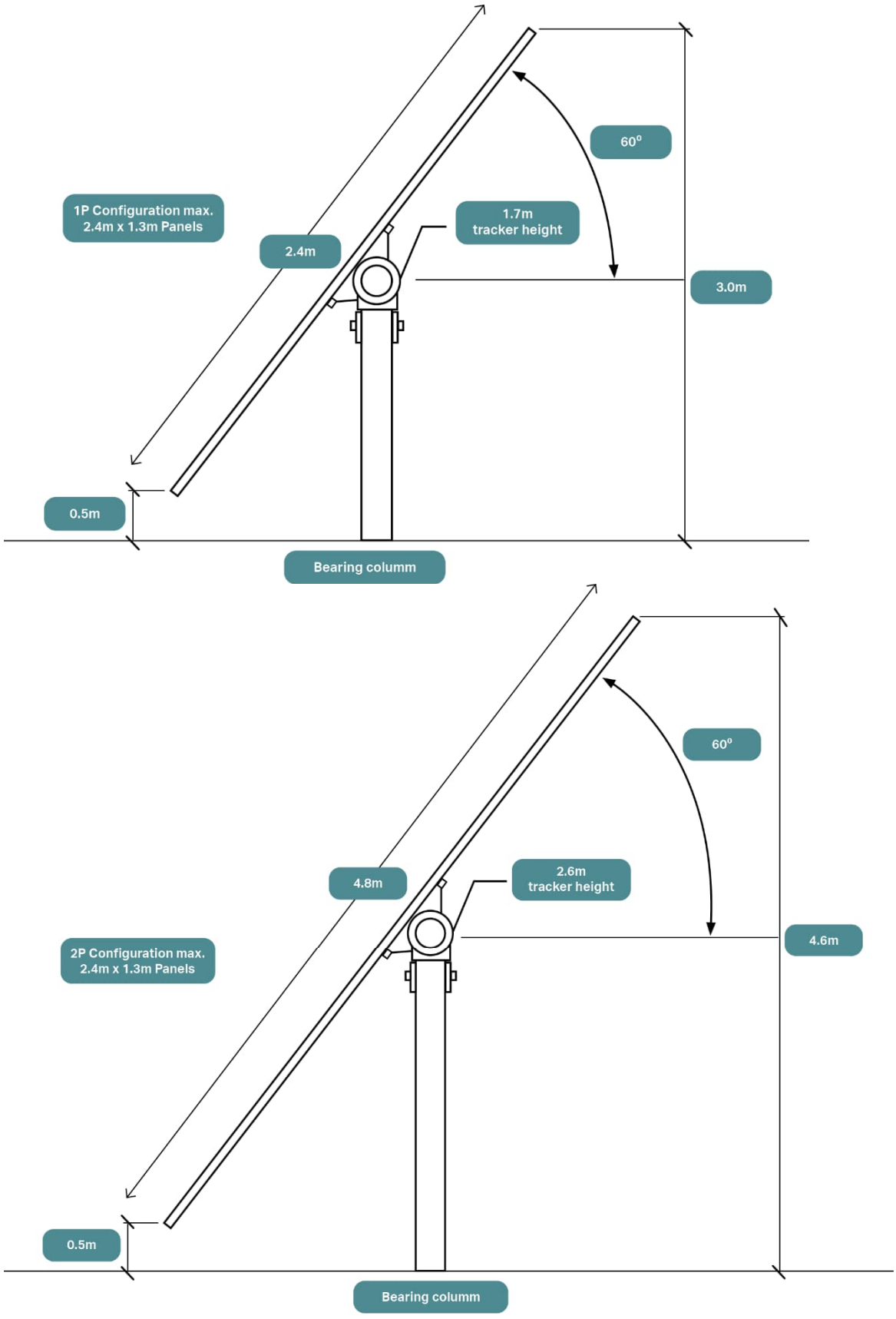


Figure 3-2 1P and 2P tracking system dimensions

Plate 3-3 Solar array block arrangement at Glenrowan Solar Farm (source: Pacific Partnerships, 2025)

Plate 3-4 PCU at Glenrowan Solar Farm (source: Pacific Partnerships, 2025)

Grid substations

The solar farm and BESS will not be interconnected, with these elements of the Project connecting independently to the Elong Elong Energy Hub, which provides onward connection to the NEM.

The solar farm and BESS will be connected to the grid via a series of substations (up to four), including:

- One substation located adjacent to and connecting the BESS to the Elong Elong Energy Hub

- Up to three substations within/adjacent and connecting the solar farm to the Elong Elong Energy Hub (four potential substation locations have been assessed in this EIS, which will be reduced during detailed design).

The Project will install up to three substations associated with the solar farm, however four potential locations have been assessed in the EIS. These locations include one at the south of the Project Area within the 'main substation' area and three from south to north within the Project Area shown as 'secondary substations' (refer to **Figure 3-1**). Selection of the substation locations will be determined during detailed design.

Figure 3-1 shows the location of the proposed substations.

Battery energy storage system

The Project includes a BESS with a capacity of up to 400 MW / 1600 MWh. The BESS will be installed adjacent to its own dedicated grid substation, providing connection to the Elong Elong Energy Hub. The purpose of the BESS will be to support the network and to store excess energy produced during periods of lower demand and release it back to the network when demand is high.

The BESS will consist of a series of storage cabinets containing lithium iron phosphate batteries, a liquid cooling system, a battery management system (BMS) and a fire suppression system. The BMS provides a range of safety measures including:

- Preventing overcharging and current surges
- Maintaining voltage levels and ensuring the automatic cut-out in the event of electrical shorts
- Overheating or other unplanned events.

A typical storage cabinet will be approximately 2.8 m tall and have a footprint of approximately 8.8 m by 1.7 m. The storage cabinets will be arranged in a series of rows, or similar groupings. It is anticipated that the storage cabinets will be mounted on a compacted gravel or concrete slab. An indicative example of the storage cabinets arrangement is shown on **Plate 3-5**.

Plate 3-5 Electrical storage array at solar power plant stock photo (iStockphoto, 2025)

Underground and overhead cabling

Each solar array block will be connected to a PCU (as described above) via an underground cable installed in trenches. The PCUs will then connect to one of the three substations via a 33 kV overhead or underground line. At the substation, the voltage will be stepped up to 330 kV, suitable for feeding into the Elong Elong Energy Hub and, subsequently, the NEM.

The BESS will connect to its own dedicated substation which will step up the voltage to 330 kV for connection to the Elong Elong Energy Hub and, subsequently, the NEM.

Proposed overhead transmission lines for the Project will include:

- **33kV transmission line:** An easement of about 30 m which includes approximately 6 km of overhead transmission line and towers. Each tower will be about 125 m apart and have an individual radius of about 1.5 m.
- **330kV transmission line:** An easement of about 60 m which includes approximately 10 km of overhead transmission line and towers. Each tower will be about 500 m apart and have an individual radius of about 20 m.

3.2.3 Ancillary infrastructure

Access, internal roads and parking

There will be five vehicle access points to the Project during both construction and operation. There will be four vehicle access points via Spring Ridge Road and one via the Golden Highway, as shown on **Figure 3-3**, and described below:

- **Access 1**– access off Spring Ridge Road, approximately 10 km south of the intersection with the Golden Highway
- **Access 2** – access off Spring Ridge Road, approximately 5 km south of the intersection with the Golden Highway
- **Access 3** – access off Spring Ridge Road, approximately 3 km south of the intersection with the Golden Highway
- **Access 4** – access off Spring Ridge Road, approximately 300 m south of the intersection with the Golden Highway
- **Access 5** – access off Golden Highway into the northwestern corner of the Project Area. This access point will be left-in, left-out and right-out turning movements.

All access points will be used for delivery of general construction equipment, with only Access 1 and Access 3 being used for OSOM. Access 2 will be used for construction workers access to the accommodation camp and main construction area.

It is understood that some upgrades to Spring Ridge Road are proposed by EnergyCo (refer to section 1.4.2 of the Central-West Orana Renewable Energy Zone Transmission project EIS (EnergyCo, 2023) which will facilitate access into Spring Ridge Road from the Golden Highway. The Proponent understands that Spring Ridge Road does not meet road width design standards specified in *Austroads Guide to Road Design Part 3: Geometric Design* (AGRD Part 3). At this stage it is unknown if there are any plans to upgrade the road to standard.

It is proposed to upgrade access points to the Project Area along Spring Ridge Road and Golden Highway. This will include local widening at access points to facilitate safe turning movements for heavy construction vehicles. Pavement condition assessments will also be required along Spring Ridge Road. Consultation with nearby projects, including Sandy Creek Solar Farm and Elong Elong Energy Hub, and Dubbo Regional and Warrumbungle Shire councils will be undertaken to coordinate any other potential upgrades.

Internal access roads will be provided to enable vehicular access around the Project Area (within the Development Footprint) during both construction and operation. Proposed internal access roads are indicatively shown on **Figure 3-3**. Local public roads within the Project Area, including Danabar Road, Sandy Creek Road, and Sweeneys Lane, will not be used by the Project during construction except

where crossing or access is required (secondary access points). Light vehicles (up to 5) may use these local Council roads during operation.

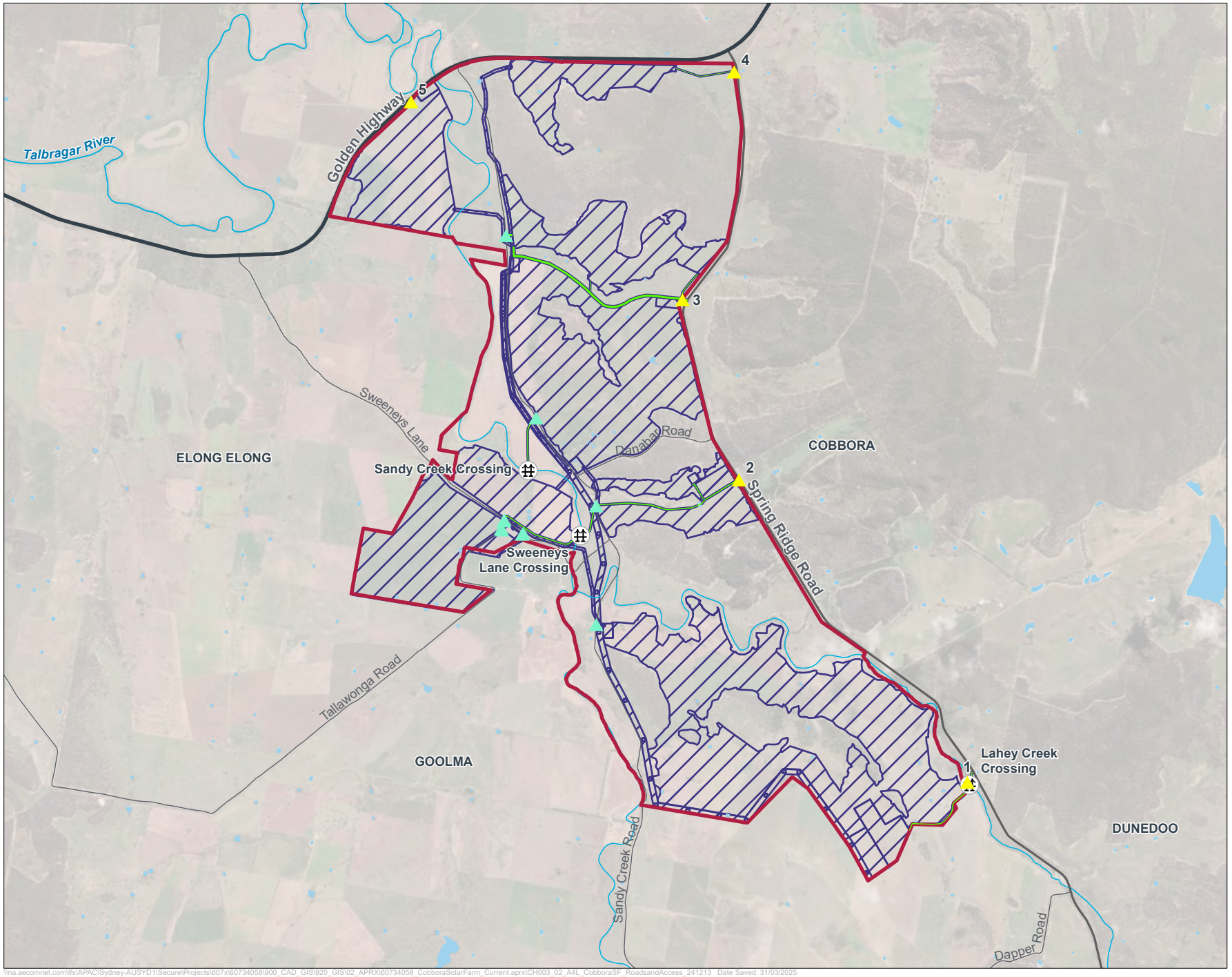
There are three locations within the Development Footprint where internal access tracks will cross both Sandy and Laheys Creek, two being along proposed new access tracks and one being along an existing internal road. It is proposed to install bridge crossings at these locations.

Two options are being considered for the bridge structure, including:

- Pre-cast concrete bridge: minimum of 4 piles (2 piles on each bank) with an estimated span of 16 m to 18 m. This option will be constructed on site and then lifted into position.
- Steel kit bridge: minimum of 4 piles (2 piles on each bank) with an estimated span of 20 m. This option will be constructed on site and then lifted into position.

Both options are estimated to have a slab thickness of approximately 30 cm and a rail height of 1 m from the slab surface.

During construction, parking will be provided for at least 100 light vehicles within the Development Footprint. Once operational, at least 30 car parking spaces will be provided within the Development Footprint, including space for heavy vehicles which may be required for replacing large components such as inverters and transformers. This amount of parking is consistent with the low operational staffing needs of the Project.



AECOM

N

0 0.5 1 km

Legend

- Project Area
- Development Footprint
- Internal roads
- Waterbody
- Watercourses
- Motorway
- Main road
- Local road
- Primary access point
- Secondary access point
- Proposed bridge crossings

FIGURE 3-3: INTERNAL ROADS AND ACCESS POINTS

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Source: Earthstar Geographics

Operation and management infrastructure

The Project will also require:

- Staff office, meeting facilities, amenities and car parking
- A spare parts storage facility
- Operations and control room including supervisory control and data acquisition (SCADA) software
- Workshop and associated infrastructure.

The above components (excluding the car parking) will all be within a single building, namely the operations and maintenance building, with carpark nearby. The layout of this building will be developed during detailed design.

Fencing

A permanent security fence will be constructed around the perimeter of each solar array section and other key infrastructure, such as the substations and BESS. The fence will be installed at the start of construction and will remain in place throughout the operation of the Project. The fence will be up to 1.8 m in height and will be made of chain link with barbed wire attached to the top in accordance with the Australian Standard AS 1725-2003 Chain-link fabric security fences and gates.

Each of the fenced areas will have its own locked security gates. Security lighting and security devices such as closed-circuit television (CCTV) cameras will also be installed around the perimeter of the fenced areas.

Landscaping

Screen planting is proposed at two locations along Spring Ridge Road to fragment views of the Project. These include bands of 10 m wide buffer screen planting integrated into the Project Area. Where possible, existing vegetation is to be retained. A Landscape Concept Plan has been prepared as part of **Appendix F (Landscape and Visual Impact Assessment)**. Proposed screen planting locations is also shown on **Figure 3-1**.

3.2.4 Subdivision

Subdivision will be required for the BESS to be registered in the National Electricity Market independently from the Solar Farm in compliance with the National Electricity Rules. This will require Lot 105 DP 754305 to be subdivided into two lots. The lot required for the BESS will be about 30 ha, and includes the portion of the substation area where the BESS substation will be located. A draft subdivision plan is provided in **Appendix Q (Subdivision Plan)**. The plan shows the coordinates of the indicative boundary vertices that will form the new lot. These vertices may be subject to change and will be confirmed during detailed design. No other Project infrastructure require subdivision.

3.2.5 Services and infrastructure

Table 3-2 summarises the existing service infrastructure in proximity to the Project Area, and amendments required to service the Project.

Table 3-2 Infrastructure services

Infrastructure	Amendment / connection requirement
Stormwater	Finished surface levels across the Development Footprint and drainage/ water quality treatment systems will give due consideration to existing catchments and flow patterns.
Potable water	Potable water will be trucked to site from a licensed source under commercial agreement and stored in tanks within the facility, as discussed in **Section 6.10**. No permanent piped supply to the Project Area is proposed.
Sewer	Wastewater management will be managed on-site via a septic system that will be periodically emptied by a licensed contractor and disposed of at an appropriately licensed facility, as discussed in **Section 6.10**. No permanent piped sewage connection to the Project Area is proposed.

Infrastructure	Amendment / connection requirement
Electricity	Facilities, including the accommodation camp and site offices, will be connected to the existing low voltage electrical aboveground network that services residential properties in the area.
Fire services	The Project will install suitable fire services in accordance with a Fire Safety Study to be completed during detailed design post-consent in accordance with Fire and Rescue NSW (FRNSW) and NSW Rural Fire Service (RFS) requirements, as discussed in **Section 6.12**.
Gas pipeline	An APA high pressure gas pipeline crosses into the Project Area at the north-western corner, outside of the Development Footprint (refer to **Figure 6-25**). No amendments or connection is required to this pipeline and the Project has been designed to avoid this asset (including appropriate buffer distances).

3.3 Project construction

This section describes the anticipated construction activities and timing. The construction methodology will be further refined during the detailed design phase and in consultation with the construction contractor, once engaged.

3.3.1 Construction timing and duration

An indicative schedule for construction is provided in **Table 3-3**. Construction is expected to commence late 2027 (subject to planning approval and other authorisations) (refer to **Plate 3-6**) and take around 47 months to complete, including 36 months for construction of the infrastructure and an additional 7 to 11 months for commissioning.

Progressive construction of the accommodation camp will commence as part of the enabling works (refer to **Section 3.3.6**).

Table 3-3 Indicative construction schedule

Task	Timing	Duration
Site establishment activities and enabling works	September 2027 to December 2027	3 months
Solar		
Construction of solar farm and grid substations	December 2027 to September 2030	33 months
Commissioning	September 2030 to August 2031	7 to 11 months
Demobilisation and rehabilitation works	March to April 2031	2 months
BESS		
Construction of BESS	May 2028 to October 2029	17 months
Commissioning	October 2029 to April 2030	7 months
Demobilisation and rehabilitation works	April 2030	1 month

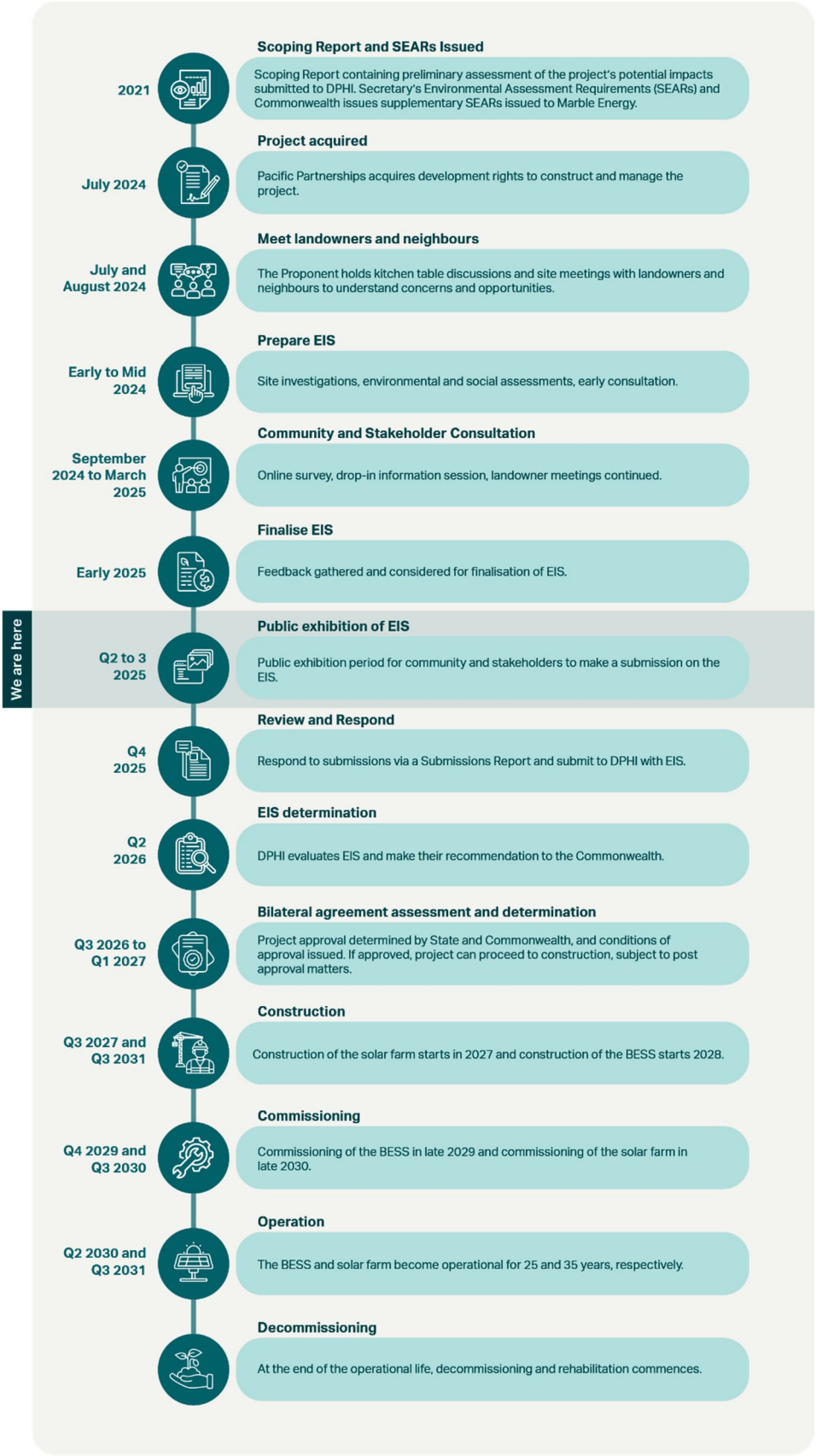


Plate 3-6 Indicative Project timeline

3.3.2 Temporary construction areas

Construction of the Project will be supported by temporary construction areas to be used for compounds, laydowns, stockpiling, parking, a helicopter landing site and workforce accommodation.

The main construction area is located in the central portion of the Project Area. This area will include the helicopter landing site and workforce accommodation. The helicopter landing site is proposed for emergency/ evacuation purposes only. Helicopters are not planned to be used as part of the typical construction of the Project. Workforce accommodation is discussed further in **Section 3.3.6**.

Three other smaller construction areas are also proposed within the Development Footprint, as shown on **Figure 3-1**.

The temporary construction areas will accommodate:

- Compounds: Site offices and staff amenities
- Laydowns: Equipment and material storage
- Stockpiling: Spoil handling, material stockpiling and storage
- Parking: Onsite light and heavy vehicle construction parking.

Temporary construction areas will be constructed on compacted hard stand material, as required. All areas will have adequate drainage and erosion and sediment controls installed. All temporary construction areas will be rehabilitated once construction is complete.

The specific design of temporary construction areas will be further developed by the construction contractor.

3.3.3 Construction plant and equipment

An indicative list of the plant and equipment that will be used to construct the Project is provided in **Table 3-4**. This list will be further refined during detailed design.

Table 3-4 Indicative plant and equipment for construction

Equipment to be used during construction	
Site establishment activities and enabling works	
Front end loaders	Dump trucks
Road trucks	Water trucks
Excavators	Graders
Compactors	Light vehicles / vans
Construction of solar farm and BESS	
Front end loaders	Dump trucks
Bobcat/excavators	Hydraulic piling machines
Graders	Scrapers
Compactors and rollers	Water trucks
Hydro vacuum excavator	Concrete trucks and pumps
Elevated work platforms	Cranes
Concrete saws and grinders	Scrapers
Backhoe	Generators
Light vehicles, vans, heavy rigid and articulated trucks (including multi trailer)	Telehandlers

Equipment to be used during construction	
Construction of grid substations and connection to the Elong Elong Energy Hub	
Directional drilling rig truck and associated infrastructure (i.e. drilling fluid recovery and recycling unit)	Pump/s for dewatering
Hydro vacuum excavator	Telehandlers
Water trucks	Excavators/backhoe
Graders	Compactors
Light vehicles, vans, heavy rigid and articulated trucks (including multi trailer)	Concrete saws and grinders
Crane truck	Tipper truck
Cable installation kit: Rollers, crawlers, cable winchers, synthetic draw ropes	Concrete trucks
Commissioning	
Elevated work platforms	Diesel generators
Cranes	Light vehicles / vans
Demobilisation and rehabilitation works	
Heavy vehicles	Water trucks
Backhoe	Compactors
Light vehicles / vans	

3.3.4 Construction traffic and access

Access and parking arrangements are described above in **Section 3.2.2**.

During construction, the following vehicle movements will be required during peak construction:

- 14 light vehicle movements per day
- 88 heavy vehicle movements per day
- 2 OSOM vehicle movements per day (as required)
- 34 shuttle bus movements per fortnight (two weeks).

Heavy vehicles will be required for various tasks, including the delivery of construction equipment, removal of spoil (if required) and the delivery of the various Project components. Light vehicles will be used for site access by workers and the movement of small equipment and materials. OSOM vehicles are expected to be required to deliver large and heavy elements such as main transformers and substation buildings. OSOM vehicles will be used on an ‘as needs’ basis only and is not expected to occur daily.

3.3.5 Construction workforce and hours

Construction will be carried out during standard working hours, as defined by the NSW EPA’s Draft Construction Noise Guideline (2020), being:

- 7am to 6pm, Monday to Friday
- 8am to 1pm, Saturdays
- No work on Sundays or public holidays.

The following construction activities may be undertaken outside these hours:

- Activities that are inaudible at non-associated residences
- Deliveries and dispatches where required by authorities or for safety reasons

- Emergency works.

Where work outside of these hours is proposed, approval from relevant authorities will be sought and any sensitive receptors will be notified.

Average total personnel across the construction program will be 390 FTE workers. The peak construction workforce will be up to 734 FTE workers for a period of up to 6 months.

3.3.6 Workforce accommodation

The construction workforce for the Project will be sourced externally, with minimal local workers commuting daily between nearby towns and the Project Area. Workers are expected to fly-in and fly-out on a scheduled day of the week. On-site accommodation will be provided for the duration of their stay. Shuttles buses will transport personnel from nearby airports to the Project Area.

Workforce accommodation will be about 9 ha in size and designed to provide capacity for the total workforce required (ie 734 FTE during peak construction). The accommodation camp will be located within the main construction area in the central portion of the Project Area adjacent to Spring Ridge Road (refer to **Figure 3-1**). This area will be directly accessible by Spring Ridge Road.

Progressive construction of the accommodation camp will commence in September 2027 as part of the enabling works. Capacity to house workers will increase over time as the workforce increases and accommodation is built. Workforce required to construct the accommodation camp will be about 20 to 40 workers per day, potentially bussed in from a muster point in either Dubbo, Dunedoo, Gulgong and/or Mudgee. Workers will be bussed to the Project Area in the morning and return in the afternoon (up to three buses each way), Monday to Saturday (standard working hours).

Camp modules will be prefabricated off-site and moved to site using heavy vehicles. Construction is expected to take up to 26 weeks.

By providing workforce accommodation, the Project seeks to be as self-sufficient as possible so as to not rely or place pressure on nearby community services. The provision of a first aid station with an onsite nurse has been included in the workers accommodation to reduce pressure on local health service providers.

3.4 Operational activities

Operation of the Project will involve the following activities:

- Monitoring of the solar farm, BESS and associated infrastructure
- Maintenance and management of equipment, site buildings and landscaping
- General office activities
- Receipt of goods
- Waste removal.

3.4.1 Operational workforce and hours

Once operational, the Project will require 20 FTE workers which will be preferentially sourced locally where feasible. The Project has the ability to run unmanned, as it will largely be controlled remotely through the SCADA system.

Regular maintenance activities will be generally conducted during standard working hours (refer to **Section 3.3.5**). If necessary, reactive or emergency maintenance may need to occur outside of standard working hours, however this is expected to be rare will be appropriately notified to neighbouring properties affected by the works.

3.4.2 Operational plant and equipment

Indicative plant and equipment that will be used to maintain the Project will include:

- Light vehicles
- Tractor slashers

- Assorted hand-held power-tools
- Pressure washers and/or automated washing system.

3.4.3 Operation and maintenance activities

Typical operation and maintenance activities are expected to include:

- Preventive maintenance including weekly and monthly inspections covering electrical, civil and environmental operational performance
- Annual cleaning of PV panels, or as required
- Vegetation management to maintain grass under and around the solar arrays
- Landscape management including maintenance of any required vegetation screening to ensure it mitigates visual impacts for receivers as intended
- Corrective maintenance activities, including but not limited to, testing and replacing of faulty components such as modules, fuses and cabling.
- Weed and pest control.

Operation and maintenance procedures and management plans will be developed and implemented for the Project.

3.4.4 Agrisolar grazing strategy

An Agrisolar Grazing Strategy was prepared for the Project by Minesoils (refer to Appendix 4 of **Appendix P (Soils, Land and Agriculture Impact Assessment)**). The Strategy covers the potential for agrisolar grazing for the following key stages of the Project:

- **Design:** aims to incorporate agriculture friendly components of design into the final plans and layout for the solar farm prior to construction
- **Construction:** outlines the most important aspects of land management to ensure the construction phase minimises impacts on the pastures, soil and land, as well as agriculture infrastructure including sheds, watering systems, and fencing whilst efficiently constructing the solar farm
- **Operational:** details the typical processes of introducing livestock, grazing and movement of livestock, and monitoring of pastures for both solar farm safety and grazing potential
- **Decommissioning and Rehabilitation:** whilst this phase is considered to be in the distant future, conceptual strategies are provided to ensure a smooth transition from the land being used as an operational solar farm to being re-established as agricultural land use.

Plate 3-7 shows merino sheep grazing at Glenrowan Solar Farm which is another solar farm project developed by CIMIC Group (whole owner of Pacific Partnerships) (refer to **Section 1.2**).

Plate 3-7 Merino sheep grazing at Glenrowan Solar Farm (source: Pacific Partnerships, 2025)

3.5 Decommissioning and rehabilitation

Once the Project reaches the end of its operational life, it will be decommissioned and the Project Area returned to its previous land use (grazing), or another permissible land use as agreed by the Project owner and the landholder at that time.

Decommissioning will require disturbance of the Development Footprint during the removal of infrastructure and equipment, including additional workers and vehicle movements.

Infrastructure above ground will be decommissioned. Buildings will be removed and where possible relocated and reused off site. Internal access roads and bridges will be removed unless an agreement with the landowner is implemented to retain them. Dismantled and decommissioned infrastructure and equipment will be recycled where practicable. Infrastructure and equipment that cannot be recycled will be disposed of at an approved waste management facility.

3.6 Estimated development cost

The EDC of the Project (solar farm and BESS) will be approximately $1.38 billion.

4.0 Statutory context

4.1 Introduction

This chapter outlines the relevant statutory requirements for the Project. Specifically, it identifies:

- The relevant planning pathway under which approval is sought
- Relevant state approvals (outlining approvals that are not required for approved SSD and approvals that are required and that should be granted substantially consistent with the consent for the approved SSD project)
- Mandatory matters for consideration, including relevant state and local environmental planning instruments
- Relevant Commonwealth approvals.

A summary of the statutory requirements for the Project is provided in **Table 4-1**, with further detail provided in **Section 4.1.1** to **Section 4.3.4**. A detailed assessment of the statutory requirements is provided in the relevant sections of the environmental impact assessment presented in **Chapter 6.0 Assessment of impacts**. A statutory compliance table is provided in **Appendix C (Statutory Compliance Table)**.

Table 4-1 Summary of statutory requirements

Category	Requirement
Power to grant approval	The Project is considered SSD, in accordance with Division 4.7 of the EP&A Act (refer to **Section 4.2.2**). In line with section 4.5 of the EP&A Act, the consent authority for the Project will be the NSW Minister for Planning and Public Spaces or the Independent Planning Commission (in the case of greater than 50 public objections to the application, local council objection, or reportable political donations made by the proponent in the two years prior to determination).
Permissibility	Section 2.36 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021* (Transport and Infrastructure SEPP) states that "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". The Project Area is zoned as RU1 Primary Production under both the Dubbo Regional LEP and Warrumbungle LEP. RU1 Primary Production is a prescribed rural zone for the purposes of this section. A small portion of land at the northern end of the Project Area is zoned as UL Unzoned Land under the Warrumbungle LEP (refer to **Figure 2-1**). Development on unzoned land is permissible with consent. Therefore, the Project is permissible with consent. A detailed justification of the planning approval pathway is provided in **Section 4.2.2**.
Other approvals	The following secondary approval is required to support the Project: • A consent under section 138 of the *Roads Act 1993* (discussed in **Section 4.3.3**. No other approvals are required under NSW legislation. For avoidance of doubt: • An environment protection licence under the *Protection of the Environment Operations Act 1997* is not required on the basis that the works do not entail a scheduled activity by reference to Schedule 1 of that Act • An approval under the *Coal Mine Subsidence Compensation Act 2017* is not required on the basis that the Project is not within a mine subsidence district

Category	Requirement
	• Landowners consent to lodge an EIS is not required from Crown Lands.
Pre-condition to exercising the power to grant approval	Pre-conditions to grant of development consent include consideration of matters discussed in further detail in **Section 4.1.1**, and **Table 4-2**.
Mandatory matters for consideration	When assessing the development application for the Project, the consent authority is required to consider the general matters for consideration as detailed in section 4.15 of the EP&A Act.

4.1.1 Pre-conditions to granting of development consent

Pre-conditions for the consent authority in exercising the power to grant development consent for the Project are provided in **Table 4-2**.

Table 4-2 Pre-conditions to granting of development consent

Statutory reference	Pre-condition	Relevance	Section in EIS
State Environmental Planning Policy (Resilience and Hazards) 2021 – section 4.6(1)	A consent authority must not consent to the carrying out of development on land unless: a) It has considered whether the land is contaminated, and b) If the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purposes for which the development is proposed to be carried out, and c) If the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.	The Project involves a change of use from agricultural use to electricity generating works. Agricultural activities have occurred on and near the Development Footprint, however, no potentially contaminative locations have been identified to date. In addition, agricultural activities, such as sheep grazing, will occur across the Project Area where possible (refer to the Agrisolar Grazing Strategy, attached as Appendix 4 of **Appendix P (Soils, Land and Agriculture Impact Assessment)**. An assessment of land use and soils has been conducted as part of this EIS (refer to **Section 6.5**).	**Section 6.5**
State Environmental Planning Policy (Transport and Infrastructure) 2021 – section 2.48(2)	Before determining a development application (or an application for modification of a consent) for development to which this clause applies, the consent authority must – a. Give written notice to the electricity supply authority for the area in which the development is to be carried out, inviting	Given the Project's connection to the electrical supply network, consultation with the electricity supply authority (Transgrid) has been undertaken. Furthermore, it is noted that following lodgement of the SSD application, DPHI will provide the EIS to Transgrid for comment.	**Chapter 5.0 Stakeholder and community engagement**

Statutory reference	Pre-condition	Relevance	Section in EIS
	comments about potential safety risks, and b. Take into consideration any response to the notice that is received within 21 days after the notice is given.		

4.2 Environmental Planning and Assessment Act 1979

4.2.1 Overview

The EP&A Act and the EP&A Regulation provide the framework for land use planning and development control in NSW. The EP&A Act and the EP&A Regulation are supported by several Environmental Planning Instruments (EPIs), including SEPPs and LEPs.

Part 4 of the EP&A Act establishes a framework for the assessment of development that requires consent, and categorises development as either 'exempt development', 'complying development', 'development requiring consent', or 'prohibited development'. The term 'development' is defined under section 1.5 of the EP&A Act.

4.2.2 Planning approval pathway

The Project meets the definition of 'development' under section 1.5 of the EP&A Act as it involves the use of land and the erection of a building. The Project falls within the definition of 'electricity generating works' as defined by the Standard Instrument, as this definition includes a building or place used for the purpose of electricity generation and storage.

Section 2.36 of *State Environmental Planning Policy (Transport and Infrastructure) 2021* (Transport and Infrastructure SEPP) states that "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".

'Electricity generating works' are prohibited under both applicable LEPs. However, the Project Area is zoned as RU1 Primary Production under both LEPs. RU1 Primary Production is a prescribed rural zone for the purposes of section 2.36 of the Transport and Infrastructure SEPP. Therefore, the Project is permissible with consent.

Section 4.36 of the EP&A Act is relevant to this Project and provides for a process where development can be declared as SSD either by a SEPP or Ministerial order published in the Gazette.

State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP) identifies development that is SSD. Section 2.6 of the Planning Systems SEPP states:

> *(1) Development is declared to be State significant development for the purposes of the Act if:*
>
> *(a) the development on the land concerned is, by the operation of an environmental planning instrument, not permissible without development consent under Part 4 of the Act, and*
>
> *(b) the development is specified in Schedule 1 and 2.*

Schedule 1 of the Planning Systems SEPP defines the following as SSD:

> *20 Electricity generating works and heat or co-generation*
>
> *Development for the purpose of electricity generating works or heat or their co-generation (using any energy source, including gas, coal, biofuel, waste, hydro, wave, solar or wind power) that:*
>
> *(a) has an estimated development cost of more than $30 million.*

The Project meets the definition of 'electricity generating works' and will also have an estimated development cost of more than $30 million. Consequently, the Project is SSD.

4.3 Mandatory considerations

Mandatory considerations for the Project are summarised in **Table 4-3** and described further in **Section 4.3.1** to **Section4.3.4**.

Table 4-3 Mandatory matters for consideration

Statutory document	Section reference	Mandatory consideration	Section in EIS
Considerations under the EP&A Act and EP&A Regulation			
Environmental Planning and Assessment Act 1979	Section 1.3	Relevant objects of the Act	**Section 7.2**
	Section 4.15(1)	**Matters for consideration – general** In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application:	
		a) The provisions of – i) Any relevant environmental planning instruments, and … iv) The regulations (to the extent that they prescribe matters for the purposes of this paragraph), that apply to the land to which the development application relates.	See below
		b) The likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality.	**Chapter 6.0 Assessment of impacts**
		c) The suitability of the site for the development.	**Section 2.4**
		e) The public interest	**Chapter 7.0 Justification of the Project**
Environmental Planning and Assessment Regulation 2021	Section 24	(1) A development application must – a) Be in the approved form, and b) Contain all of the information and documents required by: i) The approved form, and ii) The Act of this Regulation, and c) Be submitted on the NSW planning portal	This EIS will be submitted via the NSW planning portal and has been prepared in the approved form
	Section 190	(1) An environmental impact statement must contain the following information -	
		a) The name, address and professional qualifications of the person who prepared the statement,	Certification page
		b) The name and address of the responsible person,	**Table 1-1**
		c) The address of the land – i) To which the development application relates, or ii) On which the activity or infrastructure to which the	**Table 1-1**

Statutory document	Section reference	Mandatory consideration	Section in EIS
		statement relates will be carried out,	
		d) A description of the development, activity or infrastructure,	**Chapter 3.0 Project description**
		e) An assessment by the person who prepared the statement of the environmental impact of the development, activity or infrastructure, dealing with the matters referred to in this Division	This table
		(2) The person preparing the statement must have regard to -	
		a) For State significant development – the *State Significant Development Guidelines*	The EIS has been prepared in accordance with the *State significant development guidelines – preparing an environmental impact statement* (DPIE, 2022a)
		(3) An environmental impact statement must also contain a declaration by the person who prepared the statement of the following -	
		a) the statement has been prepared in accordance with this Division, and b) the statement contains all available information that is relevant to the environmental assessment of the development, activity or infrastructure, and c) the information contained in the statement is not false or misleading.	Certification page
	Section 192	(1) an environmental impact statement must contain the following -	
		a) a summary of the environmental impact statement,	**Summary**
		b) a statement of the objectives of the development, activity or infrastructure,	**Section 1.3.2**
		c) an analysis of feasible alternatives to the carrying out of the development, activity or infrastructure, considering its objectives, including the consequences of not carrying out the development, activity or infrastructure,	**Section 2.2**
		d) an analysis of the development, activity or infrastructure, including -	

Statutory document	Section reference	Mandatory consideration	Section in EIS
		i) a full description of the development, activity or infrastructure, and	**Chapter 3.0 Project description**
		ii) a general description of the environment likely to be affected by the development, activity or infrastructure and a detailed description of the aspects of the environment that are likely to be significantly affected, and	**Section 2.4** **Chapter 6.0 Assessment of impacts**
		iii) the likely impact on the environment of the development, activity or infrastructure, and	**Chapter 6.0 Assessment of impacts**
		iv) a full description of the measures to mitigate adverse effects of the development, activity or infrastructure on the environment, and	**Chapter 6.0 Assessment of impacts** **Appendix E (Compilation of Mitigation Measures)**
		v) a list of the approvals that must be obtained under another Act or law before the development, activity or infrastructure may lawfully be carried out,	**Table 4-2** **Appendix C (Statutory Compliance Table)**
		e) a compilation, in a single section of the environmental impact statement, of the measures referred to in paragraph (d)(iv),	**Appendix E (Compilation of Mitigation Measures)**
		f) the reasons justifying the carrying out of the development, activity or infrastructure, considering biophysical, economic and social factors, including the principles of ecologically sustainable development set out in section 193.	**Chapter 7.0 Justification of the Project**
Mandatory relevant considerations under EPIs			
State Environmental Planning Policy (Resilience and Hazards) 2021	Section 3.7	Consideration must be given to current circulars or guidelines published by DPHI relating to hazardous or offensive development.	**Section 4.3.1** **Section 6.11**
	Section 4.6(1)	Whether the land is contaminated	**Section 4.3.3**
	Section 4.6(2)	Change of land use from agriculture requires consideration of a preliminary investigation report.	The Project involves a change of use from agricultural uses to electricity generating works. However, no potentially

Statutory document	Section reference	Mandatory consideration	Section in EIS
			contaminative locations have been identified within the Development Footprint to date (refer to **Section 4.3.3**). In addition, agricultural activities will continue across much of the Project Area (refer to the Agrisolar Grazing Strategy, attached as Appendix 4 of **Appendix P (Soils, Land and Agriculture Impact Assessment)**)
State Environmental Planning Policy (Transport and Infrastructure) 2021	Section 2.45(2)	Any response from relevant electricity supply authority.	**Chapter 5.0 Stakeholder and community engagement**
	Section 2.122(4)(b)	• Any submission from Transport for NSW • Accessibility of the site • Any potential traffic safety, road congestion or parking implications.	**Section 6.8** **Appendix H (Traffic and Transport Impact Assessment)**
Warrumbungle Local Environmental Plan 2013	Land use table	Objectives and land uses for RU1 zone	**Section 4.3.2**
	Part 6	Additional local provisions	**Section 4.3.2**
Dubbo Regional Local Environmental Plan 2022	Land use table	Objectives and land uses for RU1 zone	**Section 4.3.2**
	Part 7	Additional local provisions	**Section 4.3.2**

4.3.1 State Environmental Planning Policies

The following SEPPs are considered relevant to the Project:

- *State Environmental Planning Policy (Planning Systems) 2021*
- *State Environmental Planning Policy (Transport and Infrastructure) 2021*
- *State Environmental Planning Policy (Resilience and Hazards) 2021.*

Each relevant SEPP is discussed in further detail below.

State Environmental Planning Policy (Planning Systems) 2021

The Planning Systems SEPP applies to the whole of NSW. The aim of Chapter 2 of this SEPP is to identify development that is significant to the State. As noted in **Section 4.2.2**, the Project is designated as SSD under section 2.6 and schedule 1 of the Planning Systems SEPP.

Notably, on the basis that the Project constitutes SSD, section 2.10 of the Planning Systems SEPP stipulates that development control plans (DCPs) do not apply.

State Environmental Planning Policy (Resilience and Hazards) 2021

Chapter 3 of the Resilience and Hazards SEPP outlines the approach used in NSW for planning and assessing the risks and hazards associated with potentially hazardous or offensive development. The Resilience and Hazards SEPP outlines matters for consideration for a project which are linked to its safety and pollution control performance. Chapter 3 applies to any projects that fall under the policy's definition of 'potentially hazardous industry' or 'potentially offensive industry'.

For projects classified as 'potentially hazardous industry' the policy establishes a comprehensive test by way of a preliminary screening assessment and preliminary hazard analysis (PHA) to determine the risk to people, property and the environment. The preliminary screening assesses the storage of specific dangerous goods classes that have the potential for significant offsite effects. Specifically, the assessment involves the identification of classes and quantities of all dangerous goods to be used, stored or produced on site, or transport to and from the site.

In response to the SEARs, a PHA has been prepared to assess potential hazards and risks associated with the Project. The complete report is attached in **Appendix M (Preliminary Hazard Analysis)** with relevant sections summarised in **Section 6.11**.

Chapter 4 of the Resilience and Hazards SEPP provides a State-wide planning approach for the remediation of contaminated land and to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment. Chapter 4 restricts consent authorities from issuing development consent on land that may be contaminated, unless the consent authority is satisfied that the land in question is suitable for the development proposed to be carried out, or will be suitable if appropriate remediation is undertaken.

A review of the NSW Environment Protection Authority (EPA) Contaminated Land Register under section 58 of the *Contaminated Land Management Act 1997* (CLM Act) and the list of NSW contaminated sites notified to the NSW EPA under section 60 of CLM Act was conducted on 23 January 2025. This review did not return any registered contaminated land sites within or surrounding the Project Area. Previous and ongoing land uses within the site are not of a type that is likely to have resulted in substantial historical contamination risk. Therefore, contamination risks related to the Project have not been considered further in this EIS.

State Environmental Planning Policy (Transport and Infrastructure) 2021

The objective of the Transport and Infrastructure SEPP is to facilitate the effective delivery of infrastructure across the State. Chapter 2 of this policy is relevant to the Project.

Chapter 2 of the Transport and Infrastructure SEPP provides that 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. Under section 2.36(1) of the Transport and Infrastructure SEPP, the provisions of the SEPP prevail where there are inconsistencies with other environmental planning instruments, including local environmental plans. The Project Area is located on land zoned RU1 Primary Production under the Dubbo Regional LEP and the Warrumbungle LEP and the Project is permitted with consent through the provisions of Transport and Infrastructure SEPP.

Section 2.48 of the Transport and Infrastructure SEPP relates to the determination of development applications that are likely to affect an electricity transmission or distribution network. Specifically, section 2.48(1) states that "*this section applies to a development application… for development comprising or involving any of the following:*

a) *The penetration of ground within 2m of an underground electricity power line or an electricity distribution pole or within 10m of any part of an electricity tower,*

b) *Development carried out-*

a. Within or immediately adjacent to an easement for electricity purposes (whether or not electricity infrastructure exists), or

b. Immediately adjacent to an electricity substation, or

c. Within 5m of an exposed overhead electricity power line.

c) [not relevant]

d) Development involving or requiring the placement of power lines underground, unless an agreement with respect to the placement underground of power lines is in force between the electricity supply authority and the council for the land concerned."

Before determining an application to which section 2.48 relates, the consent authority must:

a) Give written notice to the electricity supply authority for the area in which the development is to be carried out, inviting comments about potential safety risks, and

b) Take into consideration any response to the notice that is received within 21 days after the notice is given.

Consultation with the relevant electricity supply authority is required under section 2.48 due to the Project's connection to the electrical supply network. Throughout the preparation of this EIS, consultation with the electricity supply authority (Transgrid) has been undertaken (refer to **Chapter 5.0 Stakeholder and community engagement**). Furthermore, it is noted that following lodgement of the SSD application, DPHI will provide the EIS to Transgrid for comment.

4.3.2 Local environmental plans

The Project is located within both the Warrumbungle Shire and Dubbo Regional LGAs, which are subject to the application of the Warrumbungle LEP and Dubbo Regional LEP, respectively. Both LEPs aim to make local environmental planning provisions for land in the respective LGAs in accordance with the relevant standard environmental planning instrument under section 3.20 of the EP&A Act.

The Project is located on land zoned RU1 Primary Production under the Warrumbungle LEP and Dubbo Regional LEP (refer to **Figure 2-1**). The objectives of RU1 Primary Production for both LEPs are outlined in **Table 4-4**.

Table 4-4 LEP objectives of RU1 Primary Production

Land use zone	Dubbo LEP	Warrumbungle LEP
RU1 Primary Production	• To encourage sustainable primary industry production by maintaining and enhancing the natural resource base • To encourage diversity in primary industry enterprises and systems appropriate for the area • To minimise the fragmentation and alienation of resource lands • To minimise conflict between land uses within this zone and land uses within adjoining zones • To encourage a range of development for the purposes of tourism that supports the agricultural industry.	• To encourage sustainable primary industry production by maintaining and enhancing the natural resource base • To encourage diversity in primary industry enterprises and systems appropriate for the area • To minimise the fragmentation and alienation of resource lands • To minimise conflict between land uses within this zone and land uses within adjoining zones.

'Electricity generating works' are prohibited under both LEPs, but are permissible with consent under the Transport and Infrastructure SEPP, which governs the permissibility of this Project (refer to **Section 4.2.2**).

As the Project will cause minimal impact to the land resources, encourage diversity in the area's land use and will provide economic stimulus to support local rural communities, it is considered that the Project is generally compatible with local land use objectives.

In addition, the following principal development standards and local provisions under the LEPs have been considered:

Dubbo Regional LEP:

- Clause 4.1 Minimum subdivision lot size
- Clause 5.10 Heritage conservation
- Clause 5.14 Siding Spring Observatory - maintaining dark sky
- Clause 5.21 Flood planning
- Clause 7.1 Terrestrial biodiversity
- Clause 7.2 Earthworks
- Clause 7.3 Natural resource – riparian land and waterways
- Clause 7.5 Groundwater vulnerability.

Warrumbungle LEP:

- Clause 4.1 Minimum subdivision lot size
- Clause 4.3 Height of buildings
- Clause 4.4 Floor space ratio
- Clause 5.10 Heritage conservation
- Clause 5.21 Flood planning
- Clause 6.1 Earthworks
- Clause 6.3 Terrestrial biodiversity
- Clause 6.4 Groundwater vulnerability
- Clause 6.5 Riparian land and watercourses.

A discussion of these provisions and the relevance to the Project has been provided in **Table 4-5**.

Table 4-5 Summary of statutory requirements

LEP provision	Compliance
Dubbo Regional LEP	
Clause 4.1 Minimum subdivision lot size	The portion of the Project Area within the Dubbo Regional LGA has a minimum lot size of 400 ha. The Project does not involve subdivision within the Dubbo Regional LGA. As such, this clause is not relevant.
Clause 5.10 Heritage conservation	The Project Area is not mapped as containing any objects, items or sites of non-Aboriginal heritage significance under the Warrumbungle LEP. Notwithstanding this, a Historic Heritage Assessment Report (HHAR) has been prepared (refer to **Appendix L (Historic Heritage Assessment Report)**) and summarised in **Section 6.4**. A search of the AHIMS database showed 108 registered sites within the Project Area. The nature of Aboriginal heritage within the Project Area is detailed in the ACHAR provided in **Appendix K (Aboriginal Cultural Heritage Assessment Report)** and summarised in **Section 6.3**.
Clause 5.14 Siding Spring Observatory – maintaining dark sky	Given the distance to Siding Spring Observatory (approximately 95 km) and provided that appropriate lighting design is adopted (including motion sensors, shielding and directing light downwards), it is unlikely there will be visual impacts on the existing night time landscape. The LVIA (**Appendix F (Landscape and Visual Impact Assessment)**) provides further assessment and justification.
Clause 5.21 Flood planning	The Project Area is not mapped as flood prone land under the Dubbo Regional LEP. Notwithstanding this, a Flooding and Flood Impact Assessment has been prepared (refer to **Appendix O (Flood Impact Assessment)**) and summarised in **Section 6.9**.
Clause 7.1 Terrestrial biodiversity	Small portions of the Project Area within the Dubbo Regional LGA are mapped as having terrestrial biodiversity values.

LEP provision	Compliance
	The BDAR (**Appendix G (Biodiversity Development Assessment Report)**) has considered potential impacts to biodiversity and provides appropriate management and mitigation measures in accordance with the requirements of the BC Act. **Section 6.2** provides a summary of the biodiversity assessment and lists the management and mitigation measures that will be implemented.
Clause 7.2 Earthworks	The Project will involve earthworks, including levelling for the construction of the BESS, substation pads and site facilities. The relevant considerations outlined in Clause 7.2(3) have been assessed in various sections and appendices of this EIS. Potential impacts to these considerations can be appropriately managed with the safeguards provided in **Appendix E (Compilation of Mitigation Measures)**.
Clause 7.3 Natural resource – riparian land and waterways	Sandy Creek is located generally along the western boundary of the Project Area, and flows south to north before reaching its confluence with the Talbragar River. Sandy Creek is joined by Broken Leg Creek and Laheys Creek in the southern portion of the Project Area. Sandy Creek and Broken Leg Creek are mapped watercourses and riparian land under the Dubbo Regional LEP. An assessment of surface water impacts is provided in **Section 6.10**. An assessment of the biodiversity values of surface water potentially impacted by the Project is provided in **Appendix G (Biodiversity Development Assessment Report)** and summarised in **Section 6.2**.
Clause 7.5 Groundwater vulnerability	Portions of the Project Area within the Dubbo Regional LGA are identified as 'groundwater vulnerable' on the Dubbo Regional LEP groundwater vulnerability map. Prior to determining a development application Clause 7.5 requires the consent authority to consider the likelihood of a development resulting in groundwater contamination, as well as potential impacts on groundwater dependent ecosystems (GDEs). An assessment of groundwater vulnerability, and potential impacts to GDEs, is discussed in **Section 6.10**.
Warrumbungle LEP	
Clause 4.1 Minimum subdivision lot size	The portion of the Project Area within the Warrumbungle LGA has a minimum subdivision lot size of 600 ha. The Project will involve subdivision of the land surrounding the BESS to approx. 21 ha and is therefore partially prohibited. Despite this, under section 4.38(3) of the EP&A Act, development consent may be assessed on its merits and granted for an SSD project, even if the development is partly prohibited by an environmental planning instrument.
Clause 5.10 Heritage conservation	The Project Area is not mapped as containing any objects, items or sites of non-Aboriginal heritage significance under the Warrumbungle LEP. Notwithstanding this, a Historic Heritage Assessment Report (HHAR) has been prepared (refer to **Appendix L (Historic Heritage Assessment Report)**) and summarised in **Section 6.4**. A search of the AHIMS database showed 108 registered sites within the Project Area. The nature of Aboriginal

LEP provision	Compliance
	heritage within the Project Area is detailed in the ACHAR provided in **Appendix K (Aboriginal Cultural Heritage Assessment Report)** and summarised in **Section 6.3**.
Clause 5.21 Flood planning	The Project Area is not mapped as flood prone land under the Warrumbungle LEP. Notwithstanding this, a Flood Impact Assessment has been prepared (refer to **Appendix O (Flood Impact Assessment)**) and summarised in **Section 6.9**.
Clause 6.1 Earthworks	The Project will involve earthworks, including the likely benching of areas within the Project Area to reduce the amount of imported and exported spoil. The relevant considerations outlined in Clause 6.1(3) have been assessed in various sections and appendices of this EIS. Potential impacts to these considerations can be appropriately managed with the safeguards provided in **Appendix E (Compilation of Mitigation Measures)**.
Clause 6.3 Terrestrial biodiversity	Small portions of the Project Area within the Warrumbungle LGA are mapped as having terrestrial biodiversity values. The BDAR (**Appendix G (Biodiversity Development Assessment Report)**) has considered potential impacts to biodiversity and provides appropriate management and mitigation measures in accordance with the BC Act. **Section 6.2** provides a summary of the biodiversity assessment and lists the management and mitigation measures that will be implemented.
Clause 6.4 Groundwater vulnerability	Portions of the Project Area within the Warrumbungle LGA are identified as 'groundwater vulnerable' on the Warrumbungle LEP Groundwater vulnerability map. Prior to determining a development application Clause 6.4 requires the consent authority to consider the likelihood of a development resulting in groundwater contamination, as well as potential impacts on groundwater dependent ecosystems. An assessment of groundwater vulnerability, and potential impacts to GDEs, is discussed in **Section 6.10**.
Clause 6.5 Riparian land and watercourses	Sandy Creek is located generally along the western boundary of the Site, and flows south to north before reaching its confluence with the Talbragar River. Sandy Creek is joined by Broken Leg Creek and Laheys Creek in the southern portion of the Project Area. Sandy Creek, Broken Leg Creek and Laheys Creek are mapped watercourses and riparian land under the Warrumbungle LEP. An assessment of surface water impacts is provided in **Section 6.10**. An assessment of the biodiversity values of surface water potentially impacted by the Project is provided in **Appendix G (Biodiversity Development Assessment Report)** and summarised in **Section 6.2**.

4.3.3 Other NSW legislation

Aboriginal Land Rights Act 1983

The *Aboriginal Land Rights Act 1983* (ALR Act) was established to return land in NSW to Aboriginal peoples through lodging claims for certain Crown lands. The Act, administrated by the NSW

Department of Aboriginal Affairs, is a compensatory regime which recognises that land is of spiritual, social, cultural and economic importance to Aboriginal people.

The ALR Act establishes the NSW Aboriginal Land Council (NSWALC) and a network of over 120 autonomous Local Aboriginal Land Councils (LALCs) and requires these bodies to:

a. *take action to protect the culture and heritage of Aboriginal persons in the LALC's area, subject to any other law*

b. *to promote awareness in the community of the culture and heritage of Aboriginal persons in the LALC's area.*

LALCs constituted under the ALR Act can make land claims. The Registrar of the ALR Act has responsibility for maintaining the Register of Aboriginal Land Claims under section 166 of the Act. All land claims made since the Act came into force in 1983 have been recorded in the Register.

Under section 36(1) of the ALR Act 'claimable Crown lands' are defined as those that:

a. *are able to be lawfully sold or leased, or are reserved or dedicated for any purpose, under the Crown Lands Consolidation Act 1913 or the Western Lands Act 1901,*

b. *are not lawfully used or occupied,*

b1. *do not comprise lands which, in the opinion of the Crown Lands Minister, are needed or are likely to be needed as residential lands,*

c. *are not needed, nor likely to be needed, for an essential public service,*

d. *do not comprise lands that are the subject of an application for a determination of native title (other than a non-claimant application that is an unopposed application) that has been registered in accordance with the Commonwealth Native Title Act, and*

e. *do not comprise lands that are the subject of an approved determination of native title (within the meaning of the Commonwealth Native Title Act) (other than an approved determination that no native title exists in the lands).*

Crown lands within the Project Area include Crown land parcels, roads, and waterways. No Crown lands within the Project Area are subject to a claim under the ALR Act. Additionally, Crown lands within the Project Area are lawfully used and occupied through enclosure permits for each parcel, precluding these lands from future claims under the ALR Act. Further discussion regarding Crown Land, including the closure of some parcels, is provided below under *Crown Land Management Act 2016*.

National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (NPW Act), administered by Heritage NSW, is the primary legislation for the protection of Aboriginal cultural heritage in NSW. The NPW Act gives the Director-General of DPHI responsibility for the proper care, preservation and protection of 'Aboriginal objects' and 'Aboriginal places', defined under the Act as follows:

- An *Aboriginal object* is any deposit, object or material evidence (that is not a handicraft made for sale) relating to Aboriginal habitation of NSW, before or during the occupation of that area by persons of non-Aboriginal extraction. This includes Aboriginal remains.
- An *Aboriginal place* is a place declared so by the Minister administering the NPW Act because the place is or was of special significance to Aboriginal culture. It may or may not contain Aboriginal objects.

An AHIP issued under section 90 of the NPW Act is required if impacts to Aboriginal objects and/or places cannot be avoided. An AHIP is a defence to a prosecution for harming Aboriginal objects and places if the harm was authorised by the AHIP and the conditions of that AHIP were not contravened.

Applications for AHIPs must be supported by an ACHAR compiled in accordance with section 3 of the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011) and an Aboriginal Archaeological Report (AAR) compiled in accordance with section 2.3 of Heritage NSW's *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010). A process of Aboriginal community consultation carried out in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010) must also be

demonstrated. AHIPs may be issued for a specified Aboriginal object, Aboriginal place, land, activity or person or specified types or classes of Aboriginal objects, Aboriginal places, land, activities or persons.

Pursuant to section 4.41 of the EP&A Act, AHIPs are not required for approved SSD projects. Impacts to Aboriginal heritage values associated with such projects are typically managed under ACHMPs, which are statutorily binding once approved by DPHI. An ACHMP will be developed by a heritage specialist in consultation with Registered Aboriginal Parties and Heritage NSW to provide the post-approval framework for managing Aboriginal heritage within the Project Area.

Section 89A of the NPW Act requires notification of the location of Aboriginal sites within 'a reasonable time after the person first becomes aware of that location', with penalties for non-notification. Section 89A is binding in all instances, including SSD projects. Procedures for managing the unexpected discovery of Aboriginal objects, sites and/or human remains during the Project will be included in the ACHMP.

Details of the full contents of the ACHMP are provided in **Section 6.3**.

Biodiversity Conservation Act 2016

The purpose of the *Biodiversity Conservation Act 2016* (BC Act) is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development.

Section 7.9(2) of the BC Act states that a development application for SSD is to be accompanied by a BDAR (as defined under section 7.1 of the BC Act), unless the Planning Agency Head and the Environment Agency Head determine that the proposed development is not likely to result in a significant impact on biodiversity values.

A BDAR has been prepared for the Project in accordance with the Biodiversity Assessment Method (BAM) 2020 (see **Appendix G (Biodiversity Development Assessment Report)** and summary in **Section 6.2)**. An impact assessment was undertaken in the BDAR The BDAR outlines the avoidance, management and mitigation measures that have been incorporated into the Project design or will be employed during construction, operation or decommissioning of the Project to avoid, reduce or offset impacts on biodiversity values.

The BDAR includes an outline of the biodiversity offset credits required for the Project. The results of the BDAR assessment that have determined the credit requirement (including details of vegetation integrity scoring) are shown in **Section 6.2**.

Following the implementation of the management and mitigation measures provided in **Appendix E (Compilation of Mitigation Measures)**, the Project is considered consistent with the objectives of the BC Act.

Biosecurity Act 2015

The *Biosecurity Act 2015* (Biosecurity Act) manages the risk of biosecurity risks across the State in an integrated manner. The provisions of this Act relevant to the Project include those around the management of weeds.

The Biosecurity Act includes a general duty for all individuals who deal with plants known or likely to pose a biosecurity risk. This includes a duty to prevent, eliminate or minimise the risk posed by a prohibited matter (priority weed) as outlined in Schedule 2 of the Biosecurity Act so far as is reasonably practicable. A priority weed is one that should be prevented, managed, controlled or eradicated in the region.

Section 6.2 considers weeds declared as priority weeds in the Warrumbungle Shire and Dubbo Regional LGA that occur within and surrounding the Project Area.

Contaminated Land Management Act 1997

The general object of the CLM Act is to establish a process for investigating and (where appropriate) remediating land that the NSW EPA considers to be contaminated.

Section 60 of the CLM Act includes a 'duty to notify' where significant contamination is identified. The requirements of this section will be acted upon if any previously unidentified contamination is encountered that exceeds notification thresholds.

A search of the NSW EPA contaminated land database (undertaken on 23 January 2025) confirmed that the Project Area is not listed as a contaminated site under the CLM Act. As a result, this Act is not relevant and is not considered further.

Crown Land Management Act 2016

The *Crown Land Management Act 2016* (Crown Land Management Act) contains provisions which regulate the occupation, use, sale, lease and licence of Crown land, along with its proper management, having regard to the Act's principles. Crown land may not be occupied, used, sold, leased, licenced, dedicated, reserved, or otherwise dealt with unless authorised by the Crown Land Management Act**.**

There are a number of Crown roads located within the Project Area, as well as small parcels of Crown land. Parts of Sandy Creek and Laheys Creek within the Project Area are also designated as Crown waterways. The southern access point (from Spring Ridge Road) will require the use of a Crown road to reach the Project Area.

Crown Land has been consulted by Marble Energy and the Proponent. All of the Crown roads inside the Project Area are unformed and most are subject to an enclosure permit. The Proponent has commenced the application process to permanently close some of the unformed Crown roads and purchase the subject land from the Crown. The Proponent has also commenced the process to close a parcel of Crown Land south of Laheys Creek. This process is likely to take 12 to 18 months, and is likely to continue throughout the EIS determination process.

In addition to the roads and parcel to be closed, the Proponent will apply for a Crown Land licence for the Project Area and will continue to work with Crown Land throughout the Project as required.

Fisheries Management Act 1994

The *Fisheries Management Act 1994* (FM Act) protects fishery resources within NSW. The objectives of the FM Act include the conservation of fish stocks and key fish habitats, and conservation and management of threatened species, populations and ecological communities of fish and marine vegetation.

Key fish habitat is defined to include all marine and estuarine habitats up to highest astronomical tide level and most permanent and semi-permanent freshwater habitats including rivers, creeks, lakes, lagoons, billabongs, weir pools and impoundments up to the top of the bank. Small headwater creeks and gullies (known as first and second order streams), that only flow for a short period after rain are generally excluded, as are farm dams constructed on such systems. Wholly artificial waterbodies such as irrigation channels, urban drains and ponds, salt and evaporation ponds are also excluded except where they are known to support populations of threatened fish or invertebrates.

The Fisheries NSW Spatial Data Portal was reviewed on 23 January 2025.The portal identified Sandy Creek, Laheys Creek and an unnamed watercourse off Sandy Creek as key fish habitat (Fisheries NSW, 2025). Sandy Creek is classed a fifth order stream, Laheys Creek is classed a fourth order stream, and the unnamed watercourse is classed a third order stream. Laheys Creek and Sandy Creek are also within the mapped distribution for the threatened Southern Purple Spotted Gudgeon (*Mogurnda adspersa*).

Construction work, such as the installation of creek crossings to provide access, will be required along both Sandy Creek and Laheys Creek. As per section 4.41 of the EP&A Act, permits under section 201, 205 or 219 of the FM Act are not required for an SSDA. Despite this any required crossing (road or underground cabling) will be undertaken in accordance with NSW Department of Primary Industries (DPI) Policies and Guidelines on Fish-Friendly Waterway Crossings (DPI, n.d.), and Policy and Guidelines for Fish Habitat Conservation and Management (DPI, 2013).

Heritage Act 1977

The *Heritage Act 1977* (Heritage Act) aims to conserve heritage values across the State. 'Environmental heritage' is defined in the Heritage Act as those places, buildings, works, relics, movable objects and precincts of State or local heritage importance. Heritage items are listed on the State Heritage Register, which is established under the Heritage Act. Items of local heritage significance are also listed in LEPs.

Under section 4.41 of the EP&A Act, an approval under Part 4 or an excavation permit under section 139 of the Heritage Act is not required for an SSDA. Despite this, potential impacts of the Project on heritage items and places are discussed in **Section 6.4**.

Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) establishes the State's environmental regulatory framework and includes licensing requirements for certain scheduled activities. The POEO Act is administered by the NSW EPA.

Under section 48 of the POEO Act certain activities, as defined in schedule 1, require an Environment Protection Licence (EPL). Clause 17 of schedule 1 concerns electricity generation works. Solar energy generation does not fall within the definition of electricity generation under this clause. Accordingly, an EPL is not required under the POEO Act for the Project.

Roads Act 1993

The *Roads Act 1993* (Roads Act) regulates the carrying out of various activities on public roads, and provides for the declaration of Transport for NSW and other public authorities (including local councils) as roads authority for different types of roads (classified and unclassified).

Under section 138 of the Roads Act, the consent of the appropriate roads authority is required before a person can, for example, erect a structure or carry out a work in, on or over a public road, or dig up or disturb the surface of a public road.

As noted in **Section 3.2.3**, it is understood that some upgrades to Spring Ridge Road are proposed by EnergyCo (refer to section 1.4.2 of the Central-West Orana Renewable Energy Zone Transmission project EIS (EnergyCo, 2023) which will facilitate access into Spring Ridge Road from the Golden Highway. The Proponent understands that Spring Ridge Road does not meet road width design standards specified in *Austroads Guide to Road Design Part 3: Geometric Design* (AGRD Part 3). At this stage it is unknown if there are any plans to upgrade the road to standard. The Proponent proposes to upgrade access points to the Project Area along Spring Ridge Road and Golden Highway. Consent for these works will be sought in accordance with the Roads Act.

Water Management Act 2000

The *Water Management Act 2000* (WM Act) aims to ensure that water resources are conserved and properly managed for sustainable use benefiting both present and future generations. It is also intended to provide formal means for both the protection and enhancement of the environmental qualities of waterways and their in-stream uses as well as to provide for protection of catchment conditions.

Fresh water sources throughout NSW are managed via water sharing plans (WSP) under the WM Act. Key rules within a WSP specify when licence holders can access water and how water can be traded. The Project Area is covered by the WSPs for the Macquarie Bogan Unregulated Rivers Water Sources 2012 (Lower Talbragar River Water Source), Murray Darling Basin Fractured Rock Groundwater Sources 2011 and Murray Darling Basin Porous Rock Groundwater Sources 2020.

Section 4.41 of the EP&A Act identifies several approvals and permits which are not required for SSD projects including approvals under Section 89 (water use approval), 90 (water management work approval) and 91 (activity approval excluding an aquifer interference approval) of the WM Act.

Water requirements during construction and operation will be satisfied by the following water sources:

- Groundwater bores (existing and new)
- Trucked to site (under commercial arrangement)
- Existing landholder dams, where harvestable rights apply
- Construction sediment basins (reuse)
- Rainwater tanks collecting runoff from building roofs (reuse).

Approvals and licences associated with these sources are discussed below.

Aquifer interference

Being SSD does not exclude the requirement for an aquifer interference approval under Section 91 of the WM Act. The Project will use water from groundwater resources during construction and operation from existing or new bores and is therefore an aquifer interference activity as defined under the NSW Aquifer Interference Policy.

For existing bores, amendment of the water use or water management work approvals (Section 89 and 90 of the WM Act) will be required, as bores which extract water for stock and domestic purposes (Basic Landholder Rights) cannot be used to extract water for other purposes (such as water for construction and other commercial or industrial uses). Similarly, basic landholder rights water entitlement cannot be traded or used for purposes outside that definition.

For new bores, water use or water management work approval (Section 89 and 90 of the WM Act) is not required, however a Water Access Licence (WAL) in particular, an aquifer interference licence, will be required which may be secured by temporary trade, permanent trade or a controlled allocation order.

Penalties are defined in the WM Act for illegal take of water, examples of which include:

- Taking water otherwise than by means of a nominated water supply work (Section 60D).

As identified under the NSW Aquifer Interference Policy, in order to comply with Section 60D, SSD projects which do not have an approval under the WM Act will need to nominate on their WAL the water supply work that is causing water to be taken. In these instances, some conditions may be imposed on the WAL which relate to the taking of water as a result of the works that have been approved in the development consent.

With respect to potential groundwater take during construction, where excavation activities are being undertaken, an exemption under the WM Regulation applies to the need for licensing of incidental groundwater take of 3 ML or less per year. Incidental groundwater inflows into excavations will be monitored, recorded and reported during construction, and a WAL and appropriate entitlement obtained should inflows exceed the licensing exemption threshold of 3 ML/year established under the WM Regulation.

Commercial arrangement

Water to be trucked to site will be from a licensed source under commercial arrangement. The Project will not require an approval or licence under the WM Act for this water source.

Harvestable rights

It is proposed to source water opportunistically during construction and operation from existing landholder dams in accordance with harvestable rights (Section 53 of the WM Act), in order to further minimise demand for imported water. A WAL will not be required provided the total volume of dams used for such purposes is within the Maximum Harvestable Right Dam Capacity, and otherwise comply with the *Harvestable Rights (central inland-draining catchments) Order 2023*. As noted above, approvals under Section 89 and 90 of the WM Act are not applicable to SSD.

On site reuse

Reuse of water on site from rainwater tanks or construction sediment basins is considered to fall under a Section 90 (water management work approval) and will therefore not require approval under the WM Act.

Potential impacts on waterways are discussed in **Section 6.9** and **Section 6.10**.

4.3.4 Commonwealth legislation

Aboriginal and Torres Strait Islander Heritage Protection Act 1984

The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (ATSIHP Act) provides for the preservation and protection of places, areas and objects of particular significance to Indigenous Australians. The ATSIHP Act can override state and territory laws in situations where a state or territory has approved an activity, but the Commonwealth Minister prevents the activity from occurring by making a declaration to protect an area or object. However, the Minister can only make a decision after receiving a legally valid application under the ATSIHP Act and, in the case of long-term protection, after

considering a report on the matter. Before making a declaration to protect an area or object in a state or territory, the Commonwealth Minister must consult with the appropriate Minister of that state or territory.

No declarations relevant to the Project Area have been made under the ATSIHP Act.

Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is administered by the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) and provides a legal framework to protect and manage places defined as Matters of National Environmental Significance (MNES).

Under the EPBC Act actions that have, or are likely to have, a significant impact on a MNES are deemed a 'controlled action' and require approval from the Minister for the Environment and Water. The Project was referred under the EPBC Act (EPBC Ref: 2022/09269) and was determined to be a controlled action on 29 September 2022. Supplementary SEARs were issued detailing the requirements for the EIS.

An assessment of the impacts of the Project on MNES was under as part of the BDAR (refer to Section 10 of **Appendix G (Biodiversity Development Assessment Report)**). MNES relevant to the Project are summarised in **Table 4-6**.

Table 4-6 MNES relevant to the Project

MNES	Potential for significant impact
World heritage properties	There are no national or world heritage places within or near the Project. The Project is unlikely to result in any direct or indirect impacts to national or world heritage.
National heritage places	
Wetlands of international importance (listed under the Ramsar Convention)	No direct or indirect impacts to the wetlands are likely to occur as a result of the Project.
Nationally listed threatened species and ecological communities	Of all entities assessed, none are considered to have a significant impact.
Migratory species	No migratory species were identified as having the potential to be significantly impacted.

The BDAR (summarised in **Section 6.2** and provided in **Appendix G (Biodiversity Development Assessment Report)**) has identified threatened and migratory biodiversity listed under the EPBC Act that may be potentially affected by the Project.

The EPBC Act also requires Commonwealth approval for any activity that will, or is likely to have, a significant impact on Commonwealth land. The land on which the Project will be constructed is not Commonwealth land, and there is no Commonwealth land within proximity to the Project that could be affected by the construction or operation of the Project.

Under the EPBC Act, protected heritage items are listed on the National Heritage List (items of significance to the nation) (NHL) or the Commonwealth Heritage List (items belonging to the Commonwealth or its agencies) (CHL). Statutory references to the Register of the National Estate (RNE) in the EPBC Act were removed on 19 February 2012. However, the RNE retains an archive of over 13,000 heritage places throughout Australia.

A search of the NHL and CHL lists was undertaken in January 2025 as part of the HHAR (refer to Section 3.3 of **Appendix L (Historic Heritage Assessment Report)**). No places listed on either the NHL or CHL are located within the Project Area.

Native Title Act 1993

First Nations people have a continuous connection to land which is formally recognised in Native Title land rights throughout Australia. The *Native Title Act 1993* (NT Act) recognises and protects Native Title for Aboriginal and Torres Strait Islander people. The NT Act also makes provision for Indigenous Land Use Agreements (ILUA) to be formed, as well as a framework for notifying of native title stakeholders for certain future acts on land where native title has not been extinguished.

A National Native Title Claims search was undertaken in September 2024 as part of the ACHAR (refer to Section 5.3 of **Appendix K (Aboriginal Cultural Heritage Assessment Report)**). No Native Title Claims cover the Project Area.

5.0 Stakeholder and community engagement

5.1 Introduction

This chapter summarises engagement activities undertaken by the Proponent and Marble Energy throughout the development of the Project. Engagement for the Project was initially undertaken by Marble Energy in 2020, where a scoping report was prepared by EMM in 2021, and then consultation was undertaken by the Proponent from June 2024. Stakeholder engagement reduced between April 2023 and June 2024 during the period where the Proponent acquired the Project.

The Proponent is committed to maintaining authentic relationships with the community and interested stakeholders, previously commenced by Marble Energy, through respectful and inclusive engagement and effective communications.

5.2 Engagement objectives and approach

A Community and Stakeholder Engagement Plan (CSEP) for the Project was developed by AECOM for Marble Energy in 2022. The CSEP outlined the engagement objectives and proposed approach to inform relevant stakeholders and the community of the Project, and to obtain their feedback and input into its development. The CSEP has been progressively updated throughout the Project to capture developments in the engagement process over time.

5.2.1 Engagement objectives

Engagement objectives for the Project include:

- Consulting early, regularly, appropriately, and proactively with stakeholders to identify their concerns and opportunities and address these throughout the development of the Project
- Building a broad base of understanding of the Project across the region
- Gathering community/stakeholder input and ideas to help design and develop a Project that is a good fit in the local context, is well supported and brings local benefits
- Providing multiple methods and opportunities for stakeholders and the community to have input into the development of the Project
- Ensuring that community and stakeholder issues are properly understood and addressed in a timely manner.

5.2.2 Engagement approach

The engagement approach for the Project was guided by:

- Undertaking Engagement - Guidelines for State Significant Projects (Department of Planning, Housing and Infrastructure 2024)
- Consultation requirements as set out in the SEARs issued for the Cobbora Solar Farm on 07 November 2024
- The International Association of Public Participation (IAP2) Spectrum
- Lessons learned on other solar projects
- The footprint of the Project and likely construction and operational impacts on stakeholders and the community.

5.3 Stakeholders engaged

A range of stakeholders, community groups and individuals have been identified and consulted during the development of the EIS, as summarised in **Table 5-1**.

Table 5-1 Stakeholders engaged

Stakeholder group	Stakeholders
Federal Government Departments	Department of Climate Change, Energy, the Environment and Water (DCCEEW)
NSW Government Departments	Department of Planning, Housing and Infrastructure (DPHI)
	Transport for NSW
	Energy Corporation of NSW (EnergyCo)
	NSW Crown Lands (Dubbo)
	NSW Rural Fire Service Orana and local RFS branches (Dunedoo, Gulgong, Elong Elong)
Local Government	Warrumbungle Shire Council
	Dubbo Regional Council
Elected representatives	Dugald Saunders, State member for Dubbo
	Royal (Roy) Butler, State member for Barwon
Utility Operators	ACEREZ Partnership (ACEREZ) (formally operated by Transgrid)
	APA Group
Community groups	Dunedoo and District Development Group
	Dunedoo Health Service
Business groups	NSW Farmers Association
	Local businesses who are interested or able to be a part of the supply chain or provide direct and goods and services
Indigenous groups	NSW Aboriginal Land Council
	Central West Orana First Nations Working Group
	Dubbo-Gu Local Aboriginal Land Council
	Identified Registered Aboriginal Parties (RAPs)
Environmental groups	Dunedoo/Coolah Landcare
	Mudgee District Environment Group
Neighbouring residents	Property owners within 4 km radius of the Site
Broader community	The wider local community of Elong Elong, Dunedoo, Gollan and Dubbo.

5.4 Overview of the engagement process

Engagement for the Project includes four distinct phases, as shown in **Plate 5-1**. The purpose of each phase contributed to meeting the overarching objectives of engagement (**Section 5.2.1**). Phase one and the beginning of Phase two were undertaken by Marble Energy before the Project's development rights were acquired, with the remainder of Phase two, Phase three and Phase four undertaken by the Proponent.

Plate 5-1 Engagement phases

5.5 Engagement tools and activities used

To meet the objectives of the CSEP, a variety of tools and engagement activities were used by the Proponent as detailed in **Table 5-2**. Tools used by the Proponent after the lodgement of the EIS are outlined in **Table 5-6**. In addition, to build relationships with the community and be available for face-to-face engagement the Proponent hired a locally based (Dubbo) Community Engagement Manager.

Table 5-2 Engagement tools and activities used during Project phases

Engagement tool/activity	Purpose and description	Project phase
Drop-in sessions	Community drop-in sessions were held in Dubbo, Elong Elong and Dunedoo to allow the community to: • Ask questions of the Project team • Learn more about the Project • Provide feedback on the Project for the Proponent to consider during preparation of the EIS.	Phase one and Phase two
Landowner meetings	Directly affected and adjacent landowners were contacted individually and provided with information about the Project. Follow up one-on-one meetings took place where required regarding the Project's impacts.	Phase one and Phase two
Briefings	Briefing information in the form of presentations and/ or responses to information requests were prepared by the Project team and delivered to relevant agencies including EnergyCo, Crown Lands and ACEREZ, allowing for discussion about key elements of the Project.	Phase one and Phase two
Local event	The Proponent hosted a stand at the Dunedoo community event 'Tunes on the Turf'. The stand was staffed by the Proponent's Project team and displayed a Project banner and provided Project information. People were invited to discuss the Project with the Proponent's Project team. The objective of attending the community event was to raise awareness of the Project in the community, provide the opportunity for community members to learn more about the Project, and provide feedback and ask questions in an informal setting.	Phase two

Engagement tool/activity	Purpose and description	Project phase
Round table meetings	Round table meetings were held with members of the community who live near the Cobbora Solar Farm or other proposed renewable projects in the area. The objective of the round table meetings was to explain the change in the Project Proponent, discuss the Project timelines, gain a better understanding of issues and for the Proponent to explain design constraints and potential workable solutions on what can be influenced or changed regarding the Project's design. Roundtable discussions focused on key issues identified during the drop-in information sessions which included: • The project name • Visual amenity • Traffic and transport • Cumulative impacts of all projects • Impacts on property valuation • Project benefits	Phase two
Communication channels (Project phone line and email)	Communication channels were provided to stakeholders and the community and included: • A Project specific email address (contactus_cobbora@cobborasolarfarm.com.au) which allowed the Project team to receive and respond to enquiries • A dedicated Project phone number (02 9128 8591) which was established to answer enquiries. This line was, and continues to be, monitored from 9am to 5pm on NSW business days, with a voicemail option provided at all other times. The Project email address and phone number was provided on all public facing material and the Project website.	Phase two
Project website	An initial Project website (https://www.marbleenergy.com.au/projects/cobbora-solar-farm) was established by Marble Energy. After acquiring the development rights, a new Project website (https://www.cobborasolarfarm.com.au) was then set up by the Proponent to provide information about the Project, with specific detail on: • About Us: describing who the developer is and their history working on similar projects • Our Project: providing information about the Cobbora Solar Farm and Battery Energy Storage System (BESS) Project including frequently asked questions (FAQs) and Project contact details • Working with community: describing how the Proponent considering community feedback in the development of the Project • News: providing updates regarding key milestones in the Project's development • Updates and Publications: providing links to key documents including factsheets, community updates and media releases enabling easy access to the stakeholders and the community	Phase one and phase two

Engagement tool/activity	Purpose and description	Project phase
	• Contact us: displaying contact information (phone and email) for stakeholders to contact the Proponent.	
Community values survey	A community values survey was undertaken in October 2024. The objective of the survey was to understand community values and priorities, understand concerns relating to the Project and obtain feedback on how social benefit funds are managed. The survey ran for three and a half weeks and could be accessed through: • a QR code provided on the community update flyer • a link to the survey on the Project website • via hardcopy provided at the October 2024 drop-in sessions.	Phase two
Works notice	Given the rural location of the Project, there are limited directly adjacent neighbours to the Site. However, the Proponent was proactive in keeping nearby landowners informed of site investigations and provided email notifications to nearby landholders ahead of site works completed between August and November 2024. These notifications provided succinct information regarding the works and their impacts and included communication details for stakeholders to ask questions to Project team members.	Phase two
Community updates	Community updates were prepared and provided to the community with up-to-date information regarding the Project's status. The update was an A4 double-sided flyer which was distributed by a letterbox drop. The update included information on upcoming investigations and consultation activities.	Phase one and phase two
Fact sheets	Fact sheets were developed to provide the community with information on specific topics such as the Environmental Approvals Process. The intention of these was to break down the process and detail of technical topics to make them accessible and understandable for a general audience. The fact sheets were uploaded to the Project website and made available in hard copy during the in-person drop-in sessions. While the community update provided general information about the Project's progress, the fact sheets provided more in-depth information on key technical topics.	Phase one and phase two

5.6 Engagement undertaken

5.6.1 Phase one engagement

A comprehensive overview of engagement during phase one is provided in **Table 5-3** and outlines engagement activities undertaken during the scoping phase of the Project and includes engagement contained in the Scoping Report (EMM, 2021).

Table 5-3 Engagement activities undertaken during phase one

Stakeholder	Date	Engagement method	Description
NSW Crown Lands (Dubbo)	23 September 2021	Telephone call	A telephone call was held with Crown Lands to introduce the Project and indicate the Project will involve development on several crown roads, with details to follow during the preparation of the EIS. Crown Lands did not identify any issues of concern at this stage and confirmed that it will provide input to DPHI (formerly DPE) during the scoping and EIS stages of the Project.
	23 September 2021	Email	An email was sent to Crown Land on 23 September 2021 with Project details and a figure showing the indicative development footprint.
Warrumbungle Shire Council	19 August 2021	Email	An email was sent to Warrumbungle Shire Council to introduce the Project and seek feedback as to what issues council will require to be considered when developing the design and in undertaking environmental impact assessments.
	23 August 2021	Telephone call	A telephone call was held with council's town planner to follow up on the email and seek feedback as to what issues council will require to be considered when developing the design and in undertaking environmental impact assessments.
	25 Augst 2021	Email	An email was sent to Council with Project details and a figure showing the indicative development footprint.
Dubbo Regional Council	16 August 2021	Telephone call	The Project was introduced to Dubbo Regional Council and feedback was sought on the issues Council considers important to be included when developing the design and when undertaking environmental impact assessments.
	25 August 2021	Email	An email was sent to Council with Project details and a figure showing the indicative development footprint.
	8 September 2021	Email	An email response was received which highlighted the issues that Dubbo Regional Council considered important.
The Hon Dugald Saunders MP (State Member for Dubbo)	27 September 2021	Telephone call	Mr Saunders' office was contacted and confirmed the preferred form of communication to introduce the Project is via email.
	27 September 2021	Email	An email was sent to Mr Saunders to introduce the Project and seek a meeting to formally introduce the Project and Marble Energy.

Stakeholder	Date	Engagement method	Description
	26 October 2021	Briefing	An online briefing was held with Mr Saunders where he raised several issues.
The Hon Royal (Roy) Butler MP (State Member for Barwon)	27 September 2021	Telephone call	Mr Butler's office was contacted and confirmed the preferred form of communication to introduce the Project is via email.
	27 September 2021	Email	An email was sent to Mr Butler to introduce the Project and seek a meeting to formally introduce the Project and Marble Energy.
Transgrid	Late 2020	Online Application Form	Marble responded to Transgrid and the NSW Government's registration of interest to connect into the CWO REZ infrastructure
National Farmers' Federation (NFF)	27 September 2021	Telephone call	Marble contacted the head office and confirmed the preferred form of communication to introduce the Project is via email.
	27 September 2021	Email	An email was sent to introduce the Project and share key details on the Project Site's land capability relating to its agriculture potential. A map of the Site location and land capability was provided.
	28 September 2021	Email	A response was received that advised that NFF deals with national issues and legislation, and that the most appropriate pathway to communicate with the industry about the Project is with NSW Farmers Association.
NSW Farmers Association	27 September 2021	Email	An email to NSW Farmers introduced the Project and shared key details on the Site's land capability relating to its agriculture potential. A map of the Site location and land capability was also provided.
	14 October 2021	Briefing	Marble representatives met with the NSW Farmers Association (Orana region) to introduce the Project and company. The association agreed that the Site appears appropriate for a solar farm and highlighted the issues that NSW Farmer's Association had. The NSW Farmers Association indicated it will send its positions paper on renewable energy development for Marble's consideration. Marble also committed to keeping the Association updated with any major Project updates.
Direct neighbours and nearby landowners	23 August 2021-1 September 2021	Community Update	Nearby landholders were contacted via telephone. The purpose of the call was to introduce the Project and Marble Energy, to inform about the development application process, and to invite recipients to provide feedback regarding the Project. All conversations were constructive, with a willingness to work together to address any

Stakeholder	Date	Engagement method	Description
			amenity issues which may arise. There is a general understanding of the development of the REZ and Transgrid transmission lines.
	1 August 2021	Telephone call	A letter was distributed via letter box drop to immediate neighbours and residences within a three-kilometre radius of the Project Site on 1 September 2021. The purpose of the letter was to introduce the Project and Marble Energy, to inform about the development application process, and to invite recipients to provide feedback regarding the Project. No written responses were received as a result of this communication.
Broader community	September 2021	Website	The Project website was launched in September 2021. The website provides an overview of the Project and Marble Energy and will be kept updated with relevant information regarding the development application process, and to provide an email address for visitors to leave a comment or question.

5.6.2 Phase two engagement

A comprehensive overview of engagement during Phase two is displayed in **Table 5-4**. This table outlines engagement undertaken during the preparation of the EIS by Marble Energy and later in Phase two by the Proponent.

Table 5-4 Engagement activities undertaken in phase two

Stakeholder	Date	Engagement method	Description
Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW)	20 February 2025	Email	An email after the Project was acquired to introduce the Proponent and provide an update on the progression of the EIS.
NSW DPHI (formerly DPE)	6 November 2023	Meeting	A meeting was held with representatives of the Major Projects Team at DPHI providing an update on the progression of the EIS.
	24 November 2023	Meeting	A meeting was held with representatives of the Major Projects Team at DPHI discussing the work required to finalise the EIS.
	8 August 2024	Meeting	A meeting was held with DPHI representatives after the Proponent acquired the Project. The objective of this meeting was to introduce the Proponent and an update on the progression of the EIS.
Transport for NSW	6 March 2025	Meeting	A meeting was held with representatives of Transport for NSW to discuss proposed access points and haulage routes.
EnergyCo	4 November 2024	Meeting	A meeting was held with EnergyCo representatives. An update to the EnergyCo guidelines for cumulative impacts was provided to the Proponent. The Proponent provided an update to EnergyCo on the community engagement events that occurred in October 2024.
	30 January 2025	Meeting	Meeting with First Nations Outcomes Senior Coordinator to discuss the project, working with local people and any relevant opportunities.
NSW Crown Lands (Dubbo)	18 July 2024	Meeting	A meeting was held with representatives of NSW Crown Lands. The meeting discussed the required permits and crown land licence for the Project.
NSW Rural Fire Service Orana and local RFS branches (Dunedoo, Gulgong, Elong Elong)			The Proponent will communicate with RFS after completion of the Bushfire chapter of the EIS.
Warrumbungle Shire Council	27 August 2024	Briefing	An introductory meeting between Warrumbungle Shire Council and the Proponent was held. Warrumbungle Shire Council raised multiple issues relating to the Project including traffic and transport, community benefits and cumulative impacts.
	30 October 2024	Briefing	A follow-up meeting was held between Warrumbungle Shire Council and the Proponent. The meeting discussed the key terms of the Voluntary Planning Agreement (VPA)

Stakeholder	Date	Engagement method	Description
	23 January 2025	Meeting	Primarily a project update and further discussion was held regarding the VPA.
	20 March 2025	Meeting	A meeting was held with representatives of Warrumbungle Shire Council to discuss proposed access points and haulage routes.
	Ongoing	Email	Ongoing emails between the Proponent and Warrumbungle Shire Council to organise briefings and provide information about the Project and the VPA.
Dubbo Regional Council	9 June 2022	Briefing	An introductory briefing was held with representatives from Dubbo Regional Council to introduce the Project and the team.
	22 November 2022	Briefing	A follow-up briefing occurred with representatives from Dubbo Regional Council where Marble Energy answered questions Council had regarding the Project.
	22 January 2025	Briefing	A briefing was held between the Proponent and Dubbo Regional Council representatives. The Proponent provided an update on the Project, including the EIS, community engagement and the VPA.
	6 February 2025	Meeting	A face-to-face meeting was held between the Proponent and Council to begin more in-depth discussion about the VPA.
The Hon Dugald Saunders MP (State Member for Dubbo)	22 August 2024	Briefing	An introductory meeting occurred between the Proponent and Mr. Saunders. Issues that had been raised in community discussions to Mr. Saunders including cumulative impacts and community benefits were expressed to the Proponent.
	9 October 2024	Community update	A community update was provided to Mr Saunders, with further information about the Project and next steps.
The Hon Royal (Roy) Butler MP (State Member for Barwon)	9 October 2024	Community update	A community update was provided to Mr Butler, with further information about the Project and next steps.
	24 February 2025	Email	Mr Butler was provided a further update on the Project.
ACEREZ / Energy Corporation of NSW (EnergyCo)	Since 20 May 2024 every Fortnight	Meeting	Fortnightly meetings to discuss technical elements of the project as well as a general project update and community feedback. The Proponent's Project Director is typically in attendance at these meetings.
	4 November 2024	Meeting	A meeting between representatives from ACEREZ, EnergyCo and the Proponent. ACEREZ provided an update on the Elong Elong

Stakeholder	Date	Engagement method	Description
			Energy Hub and requested further information about the BESS from the Proponent.
APA Group	26 June 2022	Email	An introductory email from Marble Energy to APA to request further information about the gas pipeline.
	4 August 2022	Meeting	A meeting was held with Marble Energy and APA to discuss the Project and its interaction with the gas pipeline. APA raised multiple issues including access and proposed fencing.
	28 March 2025	Email	An update on the Project was provided, noting avoidance of the gas pipeline through design.
Dunedoo and District Development Group	24 July 2024	Meeting	The Proponent met with a representative of the group and discussed the potential community benefits that could come from the Project and the way that they may be managed.
Dunedoo Health Service	11 January 2024	Meeting	Marble Energy spoke to the Dunedoo Health Services Manager about the potential benefits that the Project may be able to bring to the health service and what items will most benefit the community.
Near neighbours and Local businesses	6 February 2025	Meeting	A meeting was held at Cobbora township with local landholders and business owners to discuss the Project, including the possibility of changing the name of the Project and the proposed consultative process with the wider community. Project benefits and opportunities were explored.
First Nations representatives	6 January 2023	Email	Marble Energy introduced themselves and the Project to NSW Aboriginal Land Council and requested a call back.
First Nations representatives Direct neighbours and nearby landowners	9 January 2023	Telephone call	Marble Energy received a call back from representatives at the NSW Aboriginal Land Council and discussed the engagement process.
	12 January 2023	Meeting	An initial meeting with a representative from the NSW Aboriginal Land Council was held. The meeting included cumulative impacts across the region, future developments and the Project status.
	9 March 2023	Meeting	A second meeting with representatives from the NSW Aboriginal Land Council was held to discuss the Project and discuss the cultural heritage reporting and housing in the area.
	August 2024 to October 2024	Email Telephone call	Indigenous representatives (RAPs) were consulted with, and a full list of consultation is included in the Aboriginal Cultural Heritage

Stakeholder	Date	Engagement method	Description
			Assessment Report. This consultation was to understand Aboriginal heritage sites within the Project area and determine appropriate decision making regarding the sites.
	15 January 2025	Meeting	An initial meeting with NSW Aboriginal Land Council's state councillor for Central was held to discuss the Project and provide information about its status, engagement and employment opportunities and community benefit.
	30 January 2025	Meeting	An introductory meeting with held with First Nations Outcomes Senior Coordinator to discuss the project, working with local people and any relevant opportunities
	5 February 2025	Meeting	Met with NSW Aboriginal Land Council's Western Zone director and staff to discuss the Project, providing an overview of the site, its location and further engagement planned with the Dubbo Local Aboriginal Land Council.
	17 February 2025	Meeting	An initial meeting was held with Dubbo Local Aboriginal Land Council's CEO to introduce the Project and representatives of the Project. A discussion on employment for First Nation Peoples, Dubbo LALC suggested the engagement with the LALC Board Members to discuss the project and work with them on exploring opportunities and benefits for First Nation Peoples in the Region from school age to apprenticeships.
	23 July 2024 to 24 July 2024	Meeting	The Proponent met in-person with direct neighbours of the Project and introduced the team. Feedback regarding the Project was provided by stakeholders and issues and concerns regarding flooding, water usage, community benefits and fire risk were raised.
Direct neighbours and nearby landowners Broader community	24 July 2024	Round table meeting	The Proponent met in-person with five neighbours located near the Project, answering concerns that were provided by stakeholders. These issues included visual amenity, transport access and community benefits.
	Late July to October 2024	Meeting	The Proponent met with other nearby landowners as requested regarding the Project, answering questions and requests for information when asked.

Stakeholder	Date	Engagement method	Description
	September to November 2024	Email Telephone call Meeting	Surveys required for the EIS were completed and email notifications were provided to landowners and nearby neighbours to inform them of the proposed survey dates, methodology, timing of surveys, access points and primary contacts. The notifications were followed up with a phone call by the Proponent's Land and Planning Manager to directly affected stakeholders. On the day of the investigations, an SMS was issued after exiting the site with notes where required including important detail such as the gate's status. The visual amenity site assessment included the access to nearby properties to obtain photo montages from potentially affected near neighbours' properties. The near neighbour's letter notification of the request to access was either personally dropped off to the property followed by a door knock if no response or phone call was received. Where permission was granted, it provided the project team with a chance to discuss the project and any concerns they may have. Landholders near the project area who expressed an interest or concern about visual amenity during our initial engagement were also contacted prior to the visual and glint site work to provide them with an opportunity to engage with the visual and glint specialist.
	January to February 2025	Meeting	The Proponent met with nearby landowners with information from the glint and glare assessment and shared photomontages which had information regarding the potential viewpoint from their house to the Project.
	3 May 2022	Drop-in session	A total of three sets of community drop-in sessions were held in Warrumbungle and Dubbo LGAs. The first session consisted of two, three-hour information sessions - one in the morning and one in the afternoon. The sessions were set up as interactive events to encourage community input on specific aspects of the Project. These sessions were used to ensure the community had a good understanding of the Project, the EIS timing, environmental studies and to identify interests,

Stakeholder	Date	Engagement method	Description
			issues and/or concerns early in the EIS process so they could be addressed and managed.
Broader community	19 October 2022	Drop-in session	The second round of community information sessions were used to inform the community on EIS progress and findings, report back on community feedback received and whether this was or was not incorporated. The session allowed the community to ask questions on specific issues/topics of community interest which assisted with the refinement of the Project's plans and design.
	8 October 2024 to 3 November 2024	Community values survey	A community values survey asked local residents about what they value and key priorities for their community, their thoughts on the Project and concerns, how community funds from the Project should be managed and how they will like to continue being engaged. The survey was open from 8 October 2024 to 3 November 2024 with a link provided on the website and via a QR code in the community update. Hard copies were made available to attendees at the drop-in sessions. The survey received responses from 14 community members including two responses received and accepted after the deadline.
	22 and 23 October to 2024	Drop-in session	A third round of community drop-in sessions were held in Warrumbungle and Dubbo LGAs. The objective of these sessions was to introduce the Proponent's Project team and answer general questions from the community about the Project and the environmental approval process. Sessions were held at Elong Elong Community Hall, Dubbo Square and Dunedoo Jubilee Memorial Hall. Local newspaper advertisements were placed in the Dunedoo District Diary and Dubbo Daily Liberal to inform the community about these sessions (see **Appendix D (Community Engagement Materials)**). Prior to the drop-in sessions, a community update was distributed to **897** residents who lived between Elong Elong and Dunedoo,

Stakeholder	Date	Engagement method	Description
			informing them of the sessions (see **Appendix D (Community Engagement Materials)**). The information sessions included three fact sheets showing a Project overview, a map of the Project area and a timeline of the environmental approvals process. The community update, a map of the Project area and a factsheet on the environmental approval process (see **Appendix D (Community Engagement Materials)**) were provided to attendees. A total of 10 attendees were at the Elong Elong session, 22 attendees were at the Dubbo Square session and 3 attendees were at the Dunedoo session.
	9 November 2025	Local Event	The Proponent sponsored the annual 'Tunes on the Turf' event in Dunedoo and had a booth where community members could ask questions about the Project. While at this event, the Proponent's Project team was made aware of some community members dissatisfaction with the name of the Project. Further discussions with the individual who raised this initial feedback was undertaken and a petition was provided to the Proponent and is further documented in **Table 5-5**.
	October 2024 to January 2025	Email	The Proponent identified well-respected community members who had previously made submissions on neighbouring projects and reached out with details about the Project and an opportunity for them to provide feedback.
Dubbo LALC	1 April 2025 [Placeholder date – future consultation]	Meeting	The Project was presented to the board to obtain feedback and to seek an understanding of the needs for the community. Approval was also sought to present to their members.
	15 April 2025 [Placeholder date – future consultation]	Meeting	The Project was presented to the members. Potential employment, education, apprenticeships and opportunities were discussed.

5.6.3 Key issues raised during Phase one and Phase two of engagement

Table 5-5 outlines the key issues raised during engagements undertaken (as outlined in **Table 5-3** and **Table 5-4**) and where they have been addressed in the EIS.

Table 5-5 Key issues raised during engagement

Issue category	Issues raised	Who raised issue	Where addressed in the EIS
Phase one			
Site Access	Access to the Project Site area, particularly during construction of the Project.	• Dubbo Regional Council	**Chapter 3.0 Project description**
Biodiversity	Impacts to native flora and fauna and the EPBC Act.	• Dubbo Regional Council	**Section 6.2**
Hazards and risk	Impacts of bushfire protection (grassland fire risk) and matters of consideration under the Planning for Bush Fire Guidelines 2019.	• Dubbo Regional Council	**Section 6.12**
Aboriginal heritage	Aboriginal cultural heritage impacts.	• Dubbo Regional Council	**Section 6.3**
Visual amenity	Landscaping around the perimeter of the Site to screen off the development.	• Dubbo Regional Council	**Section 6.6**
Project description	Detail of built features such as workers' offices and amenities buildings.	• Dubbo Regional Council	**Chapter 3.0 Project description**
Insurance	Impact of the development on insurance premiums for neighbouring properties.	• NSW Farmers Association	Out of scope of EIS, however impact landowners will continue to be consulted throughout Project development
Land use	Loss of agricultural production of the land.	• NSW Farmers Association	**Section 6.5**
	The impact of the Project on land prices.	• NSW Farmers Association	
Community benefits	Long term community benefit sharing arrangements.	• NSW Farmers Association • Local community	**Chapter 2.0 Strategic context**
Phase two			
Project Proponent	Request for information about the company that is developing the Project.	• Local community • Councils	**Chapter 1.0 Introduction**
Hazard and risk	Site access to firefighting equipment, access to the Site in the event of a fire,	• Local community	**Section 6.12**

Issue category	Issues raised	Who raised issue	Where addressed in the EIS
	impacts of fire to neighbouring properties.	• Warrumbungle Shire Council	
Other hazards and risk	The impact of extreme weather events on the Project (notably flooding and tornadoes).		
BESS	Request for information about the impacts of having a BESS on-site and its impact to the operation of the Solar Farm.	• Local community • ACEREZ	**Section 3.0 Project description**
Roads	Maintenance and upgrade of local roads and impact of Over Size Over Mass (OSOM) vehicles.	• Warrumbungle Shire Council • Local community	**Section 6.8**
Biodiversity	Impacts of the Project on ecology and biodiversity identified in the Project area, including requests for information about chemical use and tree removal.	• Local community	**Section 6.2**
	Pests and weeds in the Project area and biosecurity management	• Local community	
Visual Amenity	Fencing that is proposed to be used in the Site.	• Local community • APA Group • Nearby neighbours	**Section 6.6**
	Glint and glare produced as a result of the Project	• Nearby neighbours	**Section 6.6**
Cumulative impacts	Co-ordination with other Projects in the region and the impact of all proposed Projects on the region.	• Local community • Warrumbungle Shire Council • EnergyCo • The Hon Dugald Saunders MP	**Section 6.15**
Accommodation	Questions about the proposed accommodation option for workers.	• Local community • Warrumbungle Shire Council • Nearby neighbours	**Section 3.0 Project description**
Insurance	Impact of the Project on insurance premiums for neighbouring landowners.	• Local community	Out of scope of EIS, however impact landowners will continue to be consulted throughout Project development
Consultation	Proponent being more available and accessible	• Local community	This section

Issue category	Issues raised	Who raised issue	Where addressed in the EIS
	to the community and having a local presence to answer community questions.		
Land use	Questions regarding how sheep grazing will occur on the Site.	• Local community	**Section 6.5**
	Proposed use of the Site after decommissioning.	• Local community	
Decommissioning	Disposal of the panels on the Site after decommissioning.	• Local community	**Section 3.5**
Water use	Water use during construction.	• Local community • Warrumbungle Shire Council	**Section 6.10**
	Water storage during operation.	• Local community	
	Water use for accommodation.	• Local community	
Local benefits	Partnership opportunities with the community and request for information about the community benefits that will be seen.	• Local community • The Hon Dugald Saunders MP • Dunedoo and District Development Group • Councils	**Chapter 2.0 Strategic context**
Project name	Concern regarding the Project's name and its connection to the township of Cobbora.	• Local community	An engagement strategy will be developed to consult with all interested parties and the wider community about the level of support to change the existing Project name, as well as to identify potential new name options and an appropriate timeframe for this change.

5.7 Phase three consultation

Phase three consultation will occur after lodgement of the EIS, during the EIS exhibition period (minimum of 28 days).

During this period, stakeholders and the community will be able to view and download electronic copies of the EIS from the DPHI Major Projects website: https://www.planningportal.nsw.gov.au/major-projects)

A hardcopy will also be provided to the Dunedoo Library and a submission will be provided via the DPHI Major Projects website.

Written submissions and direct emails received during the EIS exhibition period will be forwarded by DPHI to the Proponent for consideration, review and response.

After reviewing the submissions, a submissions report will be prepared documenting the issues raised by stakeholders and the community in relation to the exhibited Project EIS, with responses provided for each issue(s) in submissions. This report will be submitted to DPHI and made publicly available on the DPHI major projects website.

To inform stakeholders and the community that the submissions report for the Project is available to view, the Proponent will:

- Publish a media release on the Project website
- Send an email to stakeholders and community members registered on the stakeholder database
- Provide advertisements in the local newspapers (Dubbo Daily Liberal and Dunedoo District Diary) prior to holding drop-in sessions where stakeholders can read the EIS findings and proposed mitigation measures
- Mail out a community update to residents who reside in the area surrounding the Project.

A detailed description of the consultation activities to be undertaken during the public exhibition period is provided in **Table 5-6**.

Table 5-6 Proposed consultation activities to be undertaken during Phase Three

Consultation activity	Description
Update communication channels	Update the Project website to inform of EIS completion, exhibition, and the upcoming information sessions. This will include a link to the DPHI Major Projects Portal for stakeholders to view the EIS and make a submission.
Community update	Post a community update to stakeholders in the local area and stakeholders who have been added to the mailing list, including: • A summary of EIS findings • Information on EIS exhibition and how to make a submission • Detail of upcoming information sessions which will be held in-person.
Council briefings	Present the EIS findings to Warrumbungle Shire Council and Dubbo Regional Council.
Contact landowners	Phone directly impacted and adjacent landowners to inform of EIS completion and exhibition, how their issues have been considered / addressed and how to make a submission.
Drop-in session	Present the EIS findings and proposed mitigation measures through in-person drop-in sessions throughout the locality. Stakeholders will be notified regarding these sessions through advertisements in local newspapers, updates to the website and emails to stakeholders who have requested to be placed on the mailing list.

5.7.1 Phase four engagement

The Proponent aims to maintain community engagement post approvals being obtained and throughout construction and operation of the Project. This will be maintained through online and traditional media and engagement activities. The CSEP will also be updated to reflect construction and operation of the Project and will continually be updated where relevant.

The Project email address, dedicated phone number and website will continue to be maintained to receive any concerns from the community during construction and operation of the Project.

Subject to Project approval, the Proponent will consult with key representative bodies regarding skills and training needed for local employment, and potential supply chain and commercial opportunities the Project may bring. Stakeholders to be consulted will include the Dubbo Chamber of Commerce, Regional Development Australia and Dunedoo District Development Group and other relevant selected businesses.

5.8 Consistency with DPHI guidelines

Table 5-7 outlines the consistency of the Project's engagement process with the *Undertaking Engagement - Guidelines for State Significant Projects* (Department of Planning, Housing and Infrastructure 2024) guidelines.

Table 5-7 Consistency of engagement process with DPHI guidelines

DPHI guidance for Proponents	EIS approach
1. Plan early	A CSEP was prepared at the commencement of the scoping period and updated at the commencement of EIS development to outline and guide the engagement process for each phase of the EIS (i.e. commencement of technical studies, EIS preparation and EIS exhibition).
2. Engage as early as possible	Engagement with stakeholders and neighbouring property owners began in early 2020 and has continued throughout the Project's development. Stakeholders and the community have been regularly updated of activities during Project and EIS development and feedback received has continuously influenced the overall design and delivery of the Project.
3. Ensure engagement is effective	The engagement approach involved a range of activities and tools (see **Table 5-2**) to facilitate a transparent and inclusive process, targeting relevant stakeholders. Multiple avenues were provided for people to ask questions and provide feedback specific to the Project.
4. Ensure engagement is proportionate to the scale and impact of the Project	The engagement process has included consultation with the numerous stakeholders that have an interest or will be impacted by the Project. This has included consultation with Dubbo Regional Council and Warrumbungle Shire Council where the Project is located, as well as actively seeking out and consulting one-on-one with adjacent landowners and holding a roundtable with interested residents. Discussions have been held with the broader community, including residents of Elong Elong, Dunedoo and Dubbo. A variety of communication and engagement tools have been used to inform and provide opportunities for face-to-face, written and online feedback. The engagement process adopted is in line with other SSD Solar Farm Projects and is proportional to the Project's scale and likely impacts.
5. Be innovative	The communication and engagement approaches identified in the CSEP considered the specific demographics of the local community, generally being older than other areas of the state. To build community relationships a more face-to-face based approach was adopted in combination with standard online and digital tools such as the website and online survey.
6. Be open and transparent about what can be influenced	Early and ongoing conversations were had with key stakeholders and adjacent landowners about the Project design and delivery. During these conversations, the Proponent clearly articulated the rationale behind key design elements. Negotiable items that the community and stakeholders could influence were communicated, which included the solar array footprint and landscape and visual elements such as landscaping. Stakeholders also provided local knowledge to the Project team which assisted in developing the EIS in a manner more consistent with the community's desires, for example the Solar Array area of the Project was redesigned to avoid areas subject to flooding as a result of a conversation with an interested member of the community in November 2024. Vegetation screening has also been included following a conversation with a nearby neighbour.

DPHI guidance for Proponents	EIS approach
7. Implement the community participation objectives	The following outlines how the community participation objectives in Section 3.7 of the guidelines have been addressed: • ***Identify the people or groups who are interested in or likely affected by the project:*** A CSEP was prepared prior to engagement for the Project which identified the stakeholders that were likely to have an interest of be affected by the Project (see **Table 5-1**) • ***Use appropriate engagement techniques, including the consideration of accessibility, language and jargon and the adoption of non-written and written forms of engagement:*** Engagement by the Proponent utilised a range of tools and activities, allowing stakeholders to have a variety of avenues to receive and information and provide feedback about the Project (see **Table 5-2**) • ***Involve the community, councils and government agencies early in the development of the proposal, to enable their views to be considered in project planning and design:*** Early engagement with key government agencies, Warrumbungle Shire Council and Dubbo Council, enabled issues and perspectives to be expressed early during planning for the project. **Table 5-3** and **Table 5-4** show the engagement which occurred by the Proponent and when in the project lifecycle this happened. • ***Be innovative in their engagement approach and tailor engagement activities to suit the context, scale and level of interest in the project:*** Point 5 of **Table 5-7** outlines the approach taken by the Proponent, which was tailored to the local context and demographics of the area, scale and level of interest in the Project. • ***Provide clear and concise information about what is proposed and the likely impacts for the relevant people or group they are engaging with:*** Communication material was developed using plain-language and avoided jargon so as to enable ti to be understood by all stakeholders. Stakeholders were provided multiple opportunities to talk directly with members of the Project team and to have speciifc quesitons about the Project and its impacts answered • ***Clearly outline how and when the community can be involved in the process:*** Communication materials that were presented to the community contained information about the approval process and opportunities for the community to be involved and provide feedback. Additionally, the Proponent held community drop-in sessions, attended community events and opened a community values survey in order to solicit community feedback and keep the community up to date with the Project. • ***Make it easy for the community to access information and provide feedback:*** **Table 5-2** describes the engagement activities and tools that have been used by the Proponent to date, outlining how they are appropriately tailored to the community. A variety of activities and tools were used so that the community were provided with multiple options for expressing their views and providing feedback. • ***Seek to understand issues of concern for all affected people and groups and respond appropriately to those concerns:*** Enquiries and feedback received by the Project team and the Proponent throughout the consultation period were considered during development of the EIS and responded to. Issues raised at community information sessions were followed up with roundtable meetings to enable the Proponent to better understand the issues and talk through potential solutions. Submissions received when the

DPHI guidance for Proponents	EIS approach
	EIS is placed on exhibition will be addressed by the Proponent in a submissions report. • ***Provide feedback about how community and stakeholder views were used to shape the project or considered in making decisions:*** Throughout engagement, the Proponent clearly articulated negotiable items of the Project and implemented feedback where appropriate, as outlined in point 6 of **Table 5-7**. Feedback received by stakeholders throughout the consultation period were identified and have been addressed in the EIS, as outlined in **Table 5-5**. • ***Be able to demonstrate how the demography of the area affected has been considered in how and what engagement activities have been undertaken:*** As outlined in point 5 **of Table 5-7**, a CSEP was developed which identified the profile of the community surrounding the Project. Communication tools and activities employed by the Proponent were designed to enable an inclusive process and broad involvement by the community. Engagement activities adopted included traditional forms of communication, such as newspaper advertisements and letterbox drops, as well as online resources.

6.0 Assessment of impacts

6.1 Scoping

This EIS documents a range of environmental assessments. These assessments identify potential environmental impacts that may result from the Project and identify measures to manage or mitigate these impacts as appropriate.

The identification of potential impacts, and confirmation of appropriate assessment methodologies, is determined through a scoping process. The scoping process for this EIS was based upon:

- Review of available information and documents relating to the existing environment
- A review of the Cobbora Solar Farm Scoping Report (EMM, 2021)
- Site visits
- Receipt of the SEARs for the Project (refer to **Appendix A Secretary's Environmental Assessment Requirements**)
- A review of relevant legislation and planning policy (refer to **Chapter 4.0Statutory Context**)
- Consultation with government agencies, community groups and other stakeholders (refer **Chapter 5.0 Stakeholder and Community Engagement**)
- Identification of the sensitivities of the local environment
- Understanding the characteristics of the Project
- Identification of other projects or actions that may cumulatively add to the residual impacts from the Project.

Following the scoping process outlined above, potential impacts were determined for the environmental matters in **Table 6-1**, as relevant to the Project.

Table 6-1 Environmental matters assessed within this EIS

Assessment matter	Addressed in
Biodiversity	**Section 6.2**
Aboriginal heritage	**Section 6.3**
Historic heritage	**Section 6.4**
Geology, soils and land use	**Section 6.5**
Landscape and visual impact	**Section 6.6**
Nosie and vibration	**Section 6.7**
Traffic and transport	**Section 6.8**
Flooding	**Section 6.9**
Surface water, groundwater, and water use	**Section 6.10**
Hazards and risk	**Section 6.11**
Bushfire	**Section 6.12**
Social and economic	**Section 6.13**
Other issues: Waste and air quality	**Section 6.14**
Cumulative impacts	**Section 6.15**

6.2 Biodiversity

6.2.1 Secretary's Environmental Assessment Requirements

Table 6-2 sets out the SEARs relevant to biodiversity and where the requirements have been addressed in this EIS.

Table 6-2 SEARs – Biodiversity

Relevant SEARs	
Biodiversity	**Where addressed**
The EIS must address the following specific matters: • an assessment of the biodiversity values and the likely biodiversity impacts of the Project in accordance with Section 7.9 of the *Biodiversity Conservation Act 2016* (NSW), in accordance the Biodiversity Assessment Method (BAM) 2020 and documented in a Biodiversity Development Assessment Report (BDAR). The BDAR must; - be prepared using the approved BDAR template; - document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the BAM; - assess the impacts associated with all ancillary infrastructure, including the transport route road upgrades; - include an assessment for serious and irreversible impacts (SAII) in accordance with Section 9.1 of the BAM; - include a strategy to offset any residual impacts of the development in accordance with the BC Act; and - be finalised by an accredited assessor as BAM-compliant within 14 days of submission.	• A BDAR has been prepared and is attached as **Appendix G (Biodiversity Development Assessment Report)**
• unless BCS and DPHI determine the proposed development is not likely to have any significant impacts on biodiversity values.	Not applicable
• an assessment of the likely impacts on listed aquatic threatened species, populations or ecological communities, scheduled under the *Fisheries Management Act 1994*, and a description of the measures to minimise and rehabilitate impacts, including potential impacts on Sandy Creek and Laheys Creek.	• Potential impacts to listed aquatic threatened species is discussed in **Section 6.2.4** and **Appendix G (Biodiversity Development Assessment Report)**
• a cumulative impact assessment of biodiversity values in the region from nearby developments.	• Cumulative impacts are discussed in **Section 6.15**
• if an offset is required, details of the measures proposed to address the offset obligations.	• Biodiversity offsets are discussed in **Section 6.2.4** and **Appendix G (Biodiversity Development Assessment Report)**

6.2.2 Methodology

An BDAR was prepared by Biosis to assess potential biodiversity impacts associated with the construction and operation of the Project. This report is attached as **Appendix G (Biodiversity Development Assessment Report)**. The assessment was undertaken in accordance with the *Biodiversity Conservation Act 2016* (BC Act) and Solar Guideline (DPHI, 2024d), and has been prepared in accordance with the NSW Biodiversity Assessment Method (BAM) (DPIE 2020a) and the Biodiversity Offset Scheme (BOS).

The BDAR considered the following areas:

- **Development Footprint**: approximately 1,600 ha and comprises all areas of direct impact arising from vegetation clearing, construction and operation of the Project. It includes the solar arrays, access roads, site access, perimeter fencing, Asset Protection Zones (APZs) and other associated construction works
- **Subject Land:** approximately 2,187.32 ha. The Subject Land includes the Development Footprint, and additional areas where indirect and prescribed impacts may occur, and ultimately the area to which the BAM has been applied (refer to **Figure 6-1**)
- **Assessment Area:** approximately 8,474 ha and includes the Subject Land plus the land within a 1,500 m surrounding buffer zone, as per the BAM (refer to **Figure 6-1**).

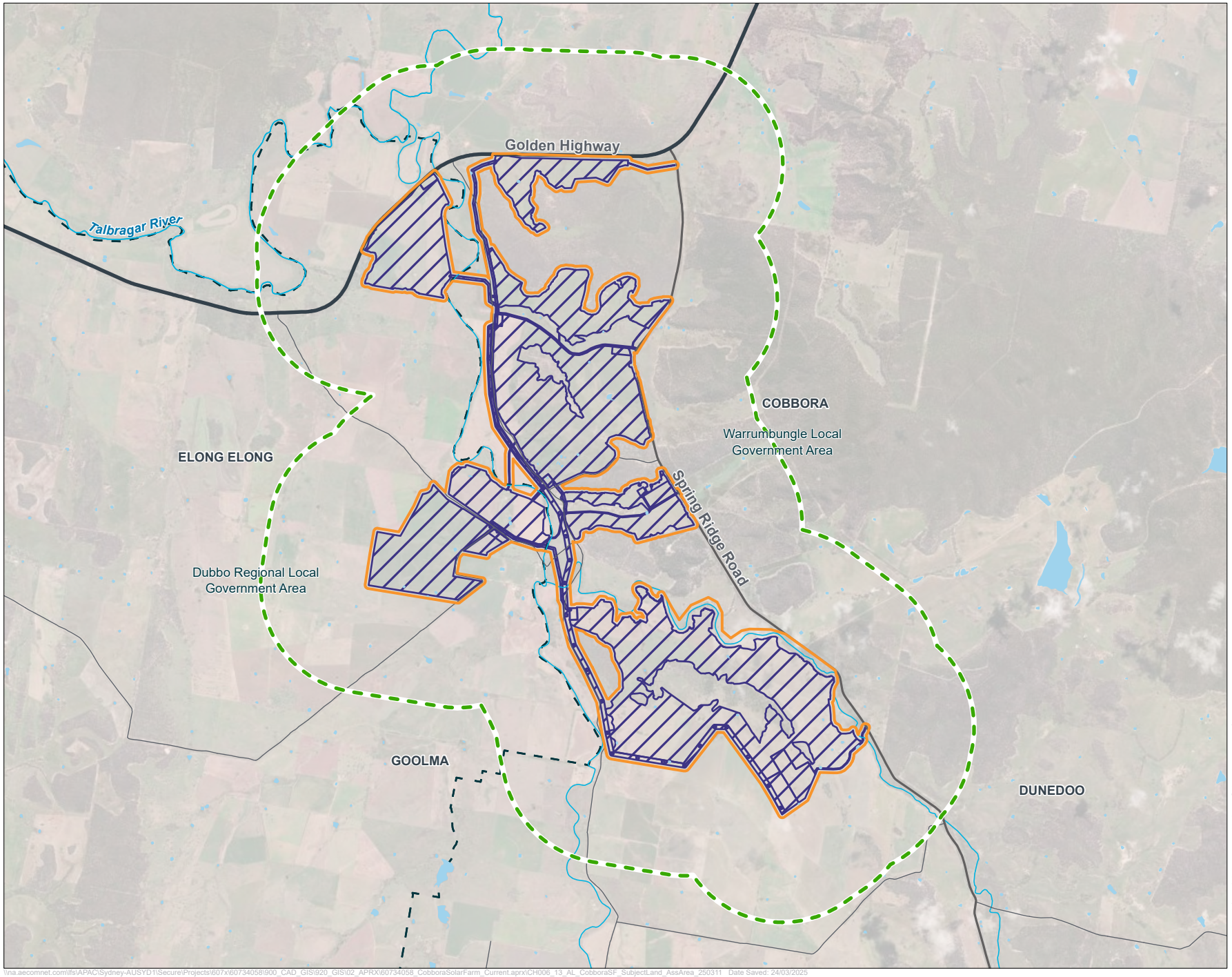
The BDAR methodology for included:

- Desktop searches to inform field investigations and understand species' likelihood of occurrence within the Subject Land
- Identification of Category 1 – Exempt land (land cleared of native vegetation as of 1 January 1990 or lawfully cleared after 1 January 1990 and before 25 August 2017), as per the *Local Land Services Act 2016*
- Survey and mapping of scattered paddock tree and hollow bearing trees (HBT)
- Survey and preparation of detailed vegetation maps
- Targeted threatened species surveys undertaken seasonally over a 2¼ year period from August 2022 through to March 2025
- Identification of measures to avoid, mitigate and offset impacts (in that order).

Scattered paddock and hollow bearing trees

As part of the tree surveys and mapping, trees were categorised into the following classes in alignment with the BAM:

- Class 1: trees that are <20 cm DBH and without hollows
- Class 2: trees that are ≥20 cm DBH and less than the large tree benchmark for the most likely plant community type or trees that are <20 cm DBH that contain at least one hollow
- Class 3: trees that are greater than or equal to the large tree benchmark for the most likely plant community type.



AECOM

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0 0.5 1 km

Legend

- Project Area
- Assessment area
- Subject land
- Development Footprint
- Local government area
- Waterbody
- Motorway
- Main road
- Local road
- Watercourses

FIGURE 6-1: SUBJECT LAND, ASSESSMENT AREA AND DEVELOPMENT FOOTPRINT

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Source: Earthstar Geographics

6.2.3 Existing environment

Landscape and land use

Slightly elevated ridgelines and vegetated foothills are present throughout the Subject Land. The majority of the land is used for improved pasture and livestock grazing (both cattle and sheep), in addition to areas of crop and tilled land.

The bulk of the vegetation in the area is found on the vegetated foothills and road reserves, where clearing and grazing have led to disturbed patches of moderate and low-condition derived grasslands. These are interspersed with fragmented patches of native grassy woodland, dry sclerophyll forest, and scattered paddock trees. While most cleared paddocks are dominated by exotic species, some grazing areas show native grassland cover derived from adjacent foothills, though they exhibit low species diversity.

Non-native vegetation

The Subject Land contains approximately 1,526.58ha of non-native or cleared vegetation, subject to varying levels of disturbance. Category 1 – Exempt Land is present within the Subject Land, largely in the form of cropped and historically disturbed and cleared paddocks utilised for the grazing of improved pastures. Many of these areas are dominated by introduced temperate and subtropical pastures such as Bambatisi Panic, Premier Digit, Rhodes Grass, *Setaria* spp. and *Paspalum* spp., as well as legumes including *Trifolium* spp. and *Medicago* spp. Some areas have small patches of a high cover but low diversity of disturbance tolerant native grasses such as the highly resilient *Sporobolus crebra* and sedges such as *Carex appressa* and *Juncus* spp. interspersed with exotic groundcover. In the southern and western areas of the Subject Land, areas of cropping were noted containing Barley and Canola.

Other exotic species (weeds) occurred as minor components throughout the Subject Land including two priority weeds (under the *Biosecurity Act 2015*) Common Prickly Pear *Opuntia stricta* and St John's Wort *Hypericum perforatum*.

A detailed land category assessment (LCA) and review of desktop vegetation mapping to PCT was undertaken to inform the extent of the area subject to assessment under the BAM and BC Act, as well as preliminary PCT mapping and field validation. This also included reviewing historical imagery for the 1980s and 1990s. This was then compared to the Draft Native Vegetation Regulatory (NVR) mapping provided by NSW Department of Climate Change, Energy, the Environment and Water for the subject land under licence. A review of historical imagery and site-based floristic assessment was undertaken to verify the presence or absence of critically endangered ecological communities (CEECs), critically endangered plants and other Category 2 – Regulated Land criteria, in order to confirm at the site scale, whether the criteria for Category 1 – Exempt Land are met. The detailed assessment can be found in Appendix G Biodiversity Development Assessment Report.

Native vegetation

The Subject Land is comprised of approximately 638.76 ha of native vegetation. **Figure 6-2** provides a map of the native vegetation extent recorded within the Assessment Area, Subject Land and Development Footprint, as assessed during field investigations undertaken in October 2022 and November 2023. The plant community types (PCT) identified within the Subject Land are described below.

Most of the vegetation within the Subject Land is comprised of forest and woodland in association with vegetated foothills and road reserves. Derived native grassland (DNG) areas are present, generally surrounding vegetated outcrops in grazed paddocks.

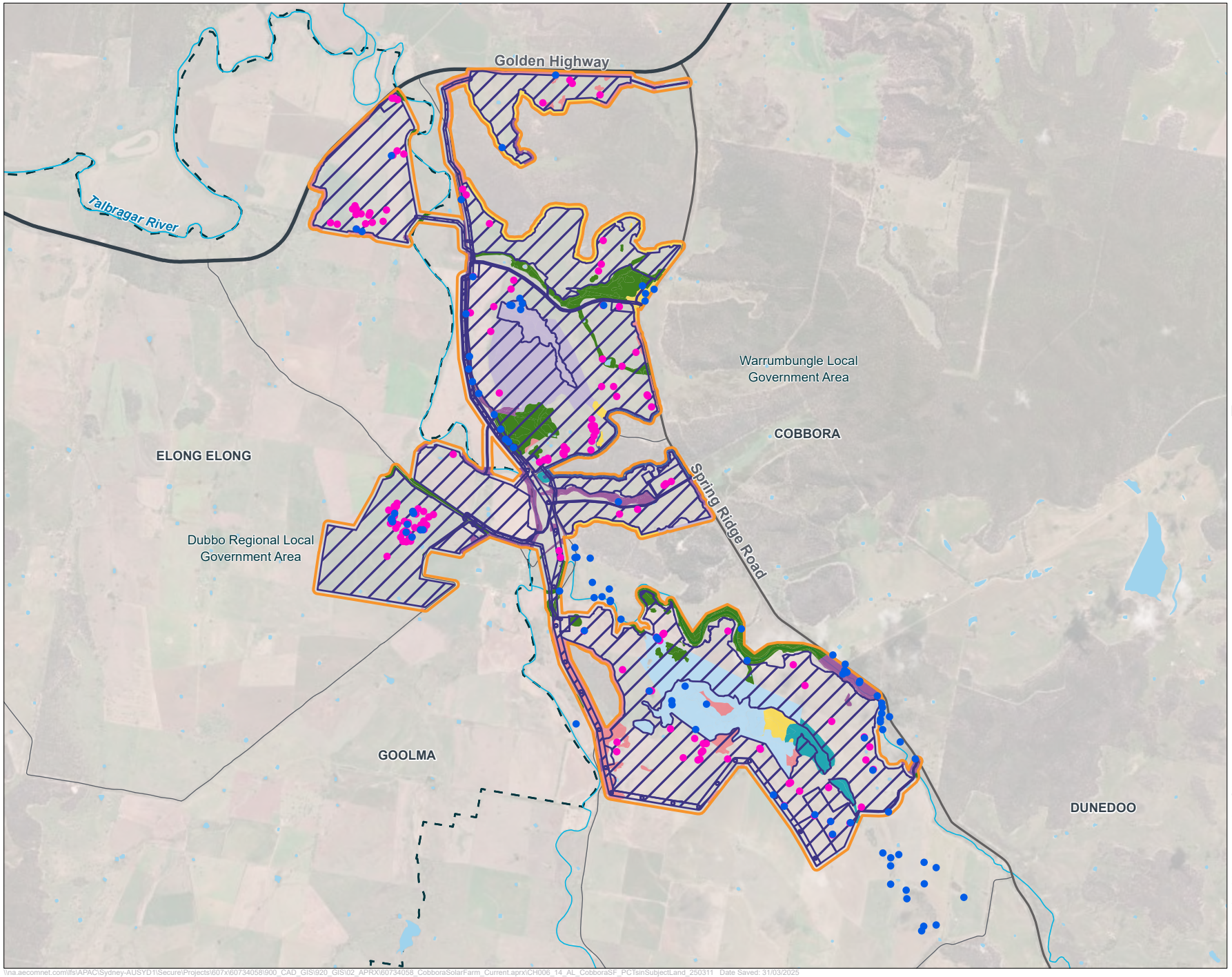
Plant community types

PCTs are based on (but not limited to) floristic composition and their location within the landscape such as elevation, landform and soil type. Dominant and characteristic floristic species data collected during surveys was used to confirm PCTs within the Subject Land.

A summary of PCTs identified within the Subject Land can be found in **Table 6-3** and shown on **Figure 6-2**.

Table 6-3 PCTs identified within the Subject Land

PCT ID	PCT name	Subject Land area (ha)	Condition (ha)
81	Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion.	93.89	Low: 42.83 Moderate: 51.06
201	Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion.	63.86	Low: 21.43 Moderate: 42.43
281	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion.	134.78	Low: 87.94 Moderate: 46.84
440	Red Stringybark - Narrow-leaved Ironbark - Black Cypress Pine - hill red gum sandstone woodland of southern NSW Brigalow Belt South Bioregion.	24.91	Low: 11.08 Moderate: 13.83
467	Blue-leaved Ironbark - Black Cypress Pine shrubby sandstone open forest in the southern Brigalow Belt South Bioregion (including Goonoo).	113.89	High: 2.30 Moderate: 21.03 Regrowth: 48.92 Low: 41.65
468	Narrow-leaved Ironbark - Black Cypress Pine +/- Blakely's Red Gum shrubby open forest on sandstone low hills in the southern Brigalow Belt South Bioregion (including Goonoo).	61.45	Moderate: 61.45
478	Red Ironbark - Black Cypress Pine - stringybark +/- Narrow-leaved Wattle shrubby open forest on sandstone in the Gulgong - Mendooran region, southern Brigalow Belt South Bioregion.	20.67	Moderate: 20.67
599	Blakely's Red Gum - Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion.	125.31	DNG: 90.12 Moderate: 30.21 High: 4.97



AECOM

N

0 0.5 1 km

Legend

- Development Footprint
- Subject land
- Local government area
- Waterbody
- Motorway
- Main road
- Local road
- Watercourses
- Hollow bearing trees
- Scattered paddock trees

Plant Community Type

- PCT 201
- PCT 281
- PCT 440
- PCT 467
- PCT 468
- PCT 478
- PCT 599
- PCT 81

FIGURE 6-2: PCTS WITHIN THE SUBJECT LAND

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Threatened ecological communities

Vegetation within the Subject Land was found to represent three threatened ecological communities (TECs) listed under the NSW BC Act, and two TECs listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).These are outlined in **Table 6-4** and **Table 6-5** below, illustrated on **Figure 6-3** and **Figure 6-4**, and briefly summarise below (refer to **Appendix G (Biodiversity Development Assessment Report)** for further detail).

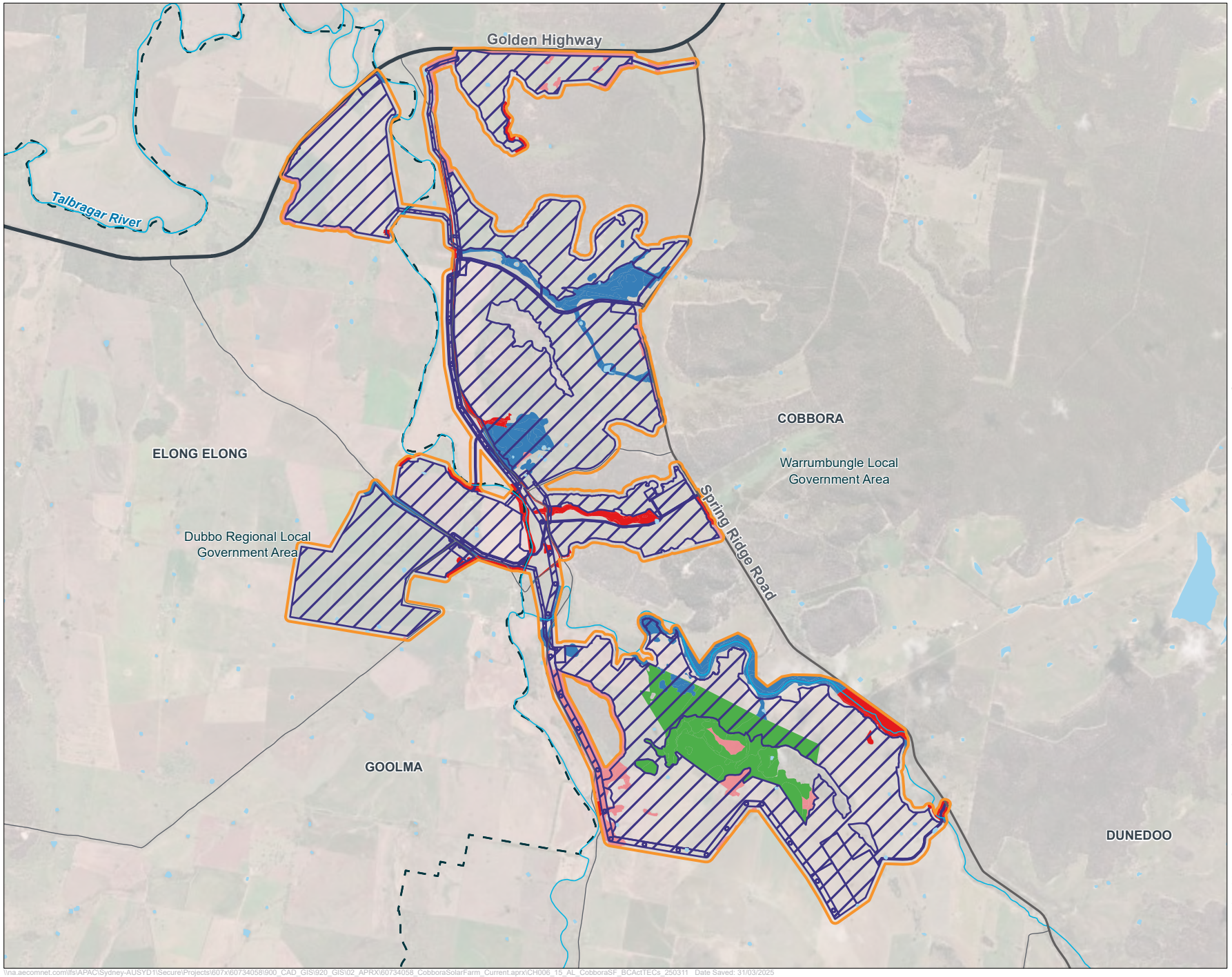
- Grey Box woodland: The moderate and low condition states of PCT 81 met the characteristic description of this TEC under the BC Act where Grey Box *E. microcarpa* is, or was (low condition areas), the most dominant species. Only the moderate condition zone of PCT 81 met the criteria for listing of this TEC under the EPBC Act.
- Fuzzy Box Woodland: All condition states of PCT 201 meet the characteristic description of this TEC under the BC Act.
- Box-Gum Woodland: All condition states of PCT 281 and PCT 599 meet the characteristic description of this TEC under the BC Act where Yellow Box and co-dominant species such as Rough-Barked Apple occur (PCT 281), and Yellow Box and Blakley's Red Gum (PCT 599) is, or was (low and moderate condition areas), the most dominant species. Only the high/moderate condition zone of PCT 281 met the criteria for listing of this TEC under the EPBC Act.

Table 6-4 Summary of BC Act TECs within the Subject Land

PCT ID	BC Act TECs	Listing status	Subject Land (ha)	Development Footprint (ha)
81	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	Endangered	93.89	31.44
201	Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Endangered	63.86	8.64
281, 599	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 Riverina Bioregions.	Critically Endangered	260.09	108.44

Table 6-5 Summary of EPBC Act TECs within the Subject Land

EPBC Act TECs	Listing status	PCT ID	Subject Land (ha)	Development Footprint (ha)
Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	81	51.06	6.55
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	281	82.03	9.35



AECOM

N

0 0.5 1 km

Legend

- Subject land
- Subject land (10km buffer)
- Development Footprint
- Local government area
- Motorway
- Main road
- Local road
- Watercourses
- Waterbody

Threatened Ecological Communities

- PCT 201
- PCT 281
- PCT 599
- PCT 81

FIGURE 6-3: BC ACT TECS WITHIN THE SUBJECT LAND

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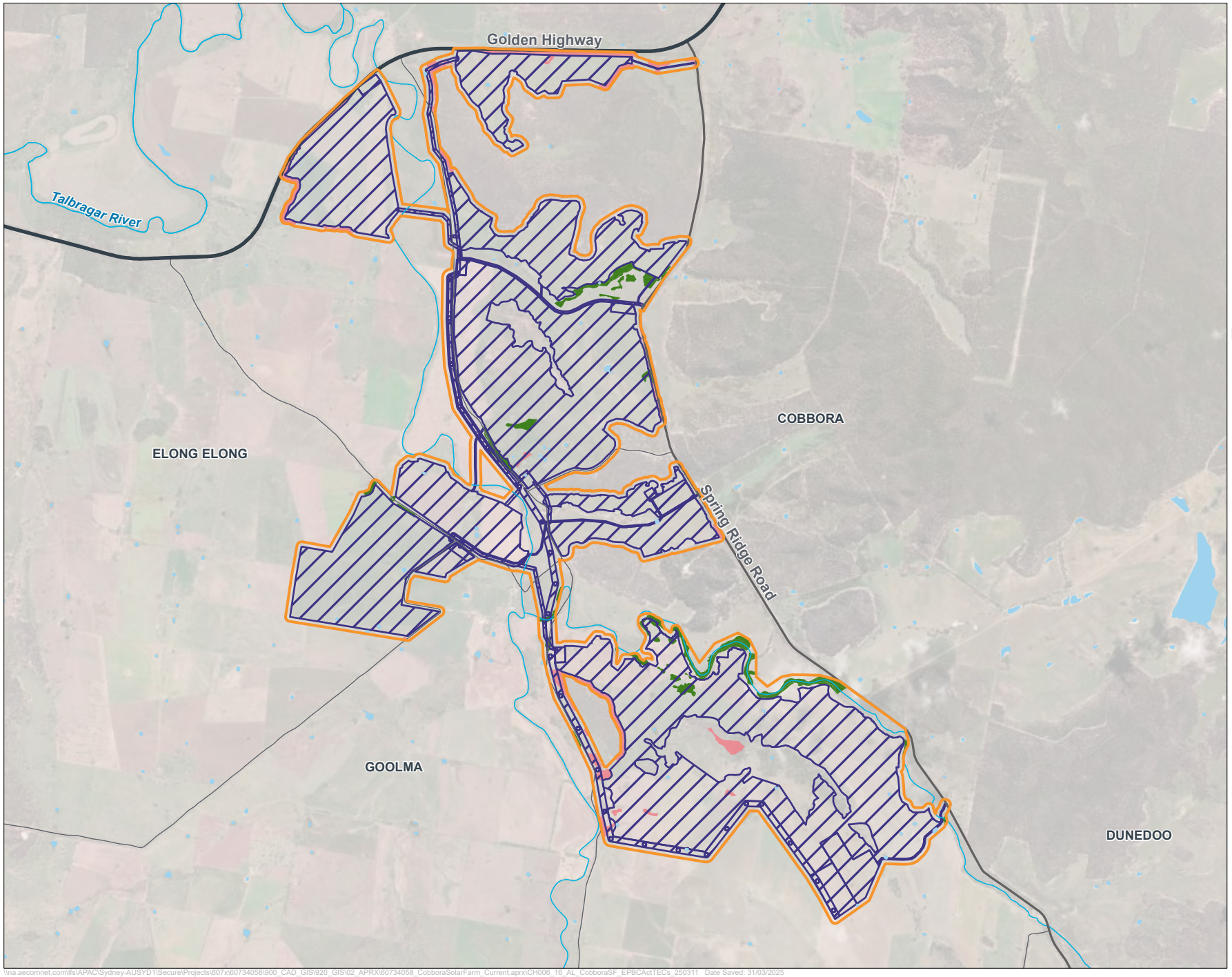

AECOM

N

0 0.5 1 km

Legend

- Subject land
- Development Footprint
- Waterbody
- Motorway
- Main road
- Local road
- Watercourses

Plant Community Type

- PCT 281
- PCT 81

FIGURE 6-4: EPBC ACT TECS WITHIN THE SUBJECT LAND

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Threatened species

A list of species predicted to occur within the Subject Land was generated as per Section 5 of the BAM, including:

- Ecosystem credit species - These are threatened species that are assumed to occur in a location based on the occurrence of PCTs or landscape features in which they are commonly found. Impacts to these species require assessment, however targeted survey is not required.

  Thirty three ecosystem credit species were predicted to occur within the Subject Land based on the vegetation present.

- Species credit species - These are threatened species for which vegetation surrogates and/or landscape features cannot reliably predict the likelihood of their occurrence. These species require targeted surveys, or must be assumed to be present where suitable surveys are not undertaken.

  Eighteen fauna and 10 flora species credit species were predicted to occur in the Subject Land through a review of the Threatened Biodiversity Data Collection (TBDC).

All but one species credit species was excluded from further assessment through targeted surveys. The remaining species is:

- Pine Donkey Orchid *Diuris tricolor* (Vulnerable – BC Act) which was observed during surveys.

Scattered paddock and hollow bearing trees

There are 166 scattered paddock trees present within the Development Footprint, 75 of which are HBTs.

Of the 166 trees within the Development Footprint, 56 were categorised as Class 2 and 110 as Class 3.

Groundwater dependent ecosystems

Review of the Groundwater Dependent Ecosystem (GDE) Atlas (BOM, 2024b) indicates no aquatic GDEs are present within the Subject Land.

6.2.4 Impact assessment

Construction

Direct impacts

The construction phase of the Project will result in direct impacts to biodiversity which cannot be avoided. The primary direct impact of the Project to biodiversity will be the clearing of native vegetation within the Development Footprint. Clearing will be required to facilitate the installation of the solar arrays, as well as minor clearing associated with electrical cabling, access roads, public road upgrades, asset protection zones (APZs), and other infrastructure such as substations, BESS, and construction compounds.

The construction of Project infrastructure requires approximately 250 ha of native vegetation and 1,349 ha of Category 1 – Exempt land to be cleared. Vegetation clearing will also result in the removal of potential habitat for Pine Donkey Orchid. A summary of direct impacts to vegetation and threatened species habitat is provided in **Table 6-6** and **Table 6-7**, respectively.

Table 6-6 Summary of direct impacts to vegetation

PCT	Associated TEC	Area to be cleared (ha)
81_Low	Grey Box Woodland BC Act	24.88
81_Moderate	Grey Box Woodland BC Act and EPBC Act	6.55
201_Low	Fuzzy Box Woodland BC Act	5.91
201_Moderate	Fuzzy Box Woodland BC Act	2.73
281_Low	Box Gum Woodland BC Act	42.30
281_Moderate	Box Gum Woodland BC Act and EPBC Act	9.25

PCT	Associated TEC	Area to be cleared (ha)
440_Low	-	9.53
440_Moderate	-	0.43
467_Low	-	39.47
467_Moderate	-	1.45
467_Regrowth	-	46.45
468_Moderate	-	3.92
478_Moderate	-	0.99
599_DNG	Box Gum Woodland BC Act	56.88
Cat 1 Exempt	-	1,349.11

Table 6-7 Threatened species habitat to be cleared

Species	Sensitivity	Area of habitat to be cleared (ha)
Pine Donkey Orchid *Diuris tricolor*	Moderate	4.50

These impacts are considered to be representative of a worst case scenario, accounting for all permanent loss of vegetation required to facilitate the Project (refer to **Appendix G (Biodiversity Development Assessment Report)** for further detail). Native ground cover disturbance under the solar arrays is expected to be temporary in nature and native ground cover will be able to regenerate and persist throughout operations, however, for the purpose of this assessment has been calculated at total loss.

Significant impacts to EPBC Act threatened species and ecological communities are assessed in the BDAR as being unlikely.

Up to 166 scattered trees will be removed from the Development Footprint. The removed scattered trees is made up of 56 class 2 and 110 class 3 trees. Further refinement of the Project during detailed design will seek to reduce the number of trees required to be cleared

Indirect impacts

Indirect impacts as a result of the Project have been considered in accordance with the BAM (refer to **Appendix G (Biodiversity Development Assessment Report)** for further detail). Indirect impacts are impacts that occur when the proposal affects native vegetation and threatened species habitat beyond the Subject Land or within retained areas. All indirect impacts can be adequately mitigated within a BMP via adaptive management and improve and maintain principles.

A summary of potential construction-related indirect impacts arising from the Project are outlined in **Table 6-8**. Overall, potential indirect impacts during the construction of the Project have been assessed as low to moderate, with the potential for indirect impacts on the following:

- 386.53 ha of adjacent vegetation.
- 39.61 ha of adjacent Fuzzy Box Woodland TEC
- 72.63 ha of adjacent Box-Gum Woodland TEC
- 44.23 ha of adjacent Grey Box Woodland TEC
- 2.74 ha of Pine Donkey Orchid potential and known habitat
- 38 remaining HBTs
- Retained areas of adjacent vegetation containing known threatened flora species, subject to monitoring and adaptive management

- All hill crests and slopes supporting rocky habitat, bush rocks and partially buried rocks.

Table 6-8 Summary of potential indirect impacts

Potential indirect impact	Description
Inadvertent impacts on adjacent habitat or vegetation	Impacts to adjacent vegetation during construction are anticipated to be avoided or minimised through standard construction measures, including appropriate exclusion fencing and demarcation. The BDAR identified inadvertent impacts on adjacent habitat or vegetation as a low potential impact.
Reduced viability of adjacent habitat due to edge effects (i.e. changes at the boundary of the adjacent habitat)	Adjacent habitats are subject to disturbance via clearing and existing agricultural land use under existing conditions. There is the potential for a marginal increase in edge effects, associated with: • removal of adjacent native vegetation within the Development Footprint • increases in the distance between scattered trees and HBTs, following removal of scattered paddock trees The BDAR identified the reduced viability of adjacent habitat due to edge effects as a low potential impact.
Reduced viability of adjacent habitat due to noise, dust or light spill	Adjacent habitat may be temporarily affected by noise, dust, and light spill during construction. For example, there may be a temporary reduction in foraging within the Subject Land and within retained scattered trees. As the Project has retained large patches of vegetation through avoidance of hillcrests and hills impacts on the viability of adjacent habitat due to noise, dust and light spill is expected to be low.
Inadvertent reduction in habitat connectivity	Connectivity is anticipated to remain largely the same with Project infrastructure replacing cropped paddocks. Connectivity remains throughout areas of retained vegetation within the hillcrests.
Transport of weeds and pathogens from within the Development Footprint to adjacent vegetation	Weeds within the Development Footprint were observed to be consistent with those occurring within the retained adjacent vegetation. The increased transport of pathogens and weeds between the Development Footprint and adjacent vegetation is considered unlikely to occur, with potential impacts expected to be low.
Loss of breeding habitats	The Project will remove 45% of HBTs within the Subject Land. Indirect impacts associated with the loss of breeding habitats are not considered likely to be substantial to any locally occurring threatened, or non-threatened species, based on numbers of retained patches and HBTs. Connectivity will remain throughout areas of retained vegetation minimising impacts to threatened species from loss of breeding habitat. The BDAR has identified the loss of breeding habitats as a moderate potential impact.
Increased risk of starvation, exposure and loss of shade or shelter	Indirect impacts are largely associated with increased competition for suitable habitat and foraging areas, and associated potential for increased risk of starvation, exposure and loss of shade or shelter. The removal of HBTs will increase hollow competition for common fauna species within the landscape.

Potential indirect impact	Description
	Connectivity will remain throughout areas of retained vegetation minimising impacts to threatened species from loss of suitable habitat and foraging areas. This includes retaining connectivity of habitat within the Development Footprint set back from the two key waterway areas, with selective crossings proposed. The BDAR identified increased risk of starvation, exposure and loss of shade or shelter as a low-moderate potential impact.
Trampling of threatened flora species	Pine Dinkey Orchid was identified in two isolated populations within the Subject Land, with potential indirect impacts to 2.74 ha of Pine Donkey Orchid potential and known habitat. The BDAR has identified the trampling of threatened flora species as being a low potential due to the avoidance of known threatened flora species within the Subject Land, and the offset from the Development Footprint to retained areas of potential habitat for threatened flora species.
Inhibition of nitrogen fixation and increased soil salinity	The BDAR has identified this impact is not expected to result from the Project, and that there will be no substantial changes to the level of nitrogen fixation or soil salinity in the locality.
Fertiliser drift	The BDAR has identified this impact is not expected to result from the Project. No fertiliser is proposed to be used.
Wood collection	The BDAR has identified this impact to be negligible for this Project. Landholders are not expected to be likely to undertake wood collection beyond existing rural approvals within the retained vegetation to a level that it will have a detrimental effect. Unauthorised access and collection of wood is expected to be negligible.
Removal and disturbance of rocks, including bush rock	The majority of rocky habitat that will support species with a preference for bush rocks and rocky crests will be avoided by the project. Most of the Development Footprint has limited bush rock presence due to extensive history of cropping and is unlikely to support fauna species with a preference for bush rocks. Potential impacts from the removal and disturbance of rocks is expected to be low.

Prescribed impacts

Prescribed impacts, as identified in clause 6.1 of the *Biodiversity Conservation Regulation 2017*, are impacts of development on:

- The habitat of threatened species or communities, including karst, caves, crevices, cliffs, rocks, geological features of significance, human-made structures or non-native vegetation
- Areas connecting threatened species habitat, such as movement corridors
- Water quality, water bodies, and hydrological processes that sustain threatened entities
- Threatened and protected animals from turbine strikes from a wind farm (not relevant to the Project)
- Threatened species or fauna that are part of a TEC from vehicle strikes.

Potential prescribed biodiversity impacts associated with construction of the Project are summarised in **Table 6-9**.

Table 6-9 Summary of prescribed impacts during construction

Prescribed impact	Description
Impacts on karst, caves, crevices, cliffs, rocks and other geological features of significance	No karst, caves or cliffs occur within the Subject Land or are known to occur within 2 km of the Subject Land. Therefore, no impacts on karst, caves or cliffs are anticipated. Rocky areas generally occur in proximity to foothills, hillcrests, hills and slopes within the Subject Land, and have been largely avoided by the Project. Minimal partially buried rocks or rock habitats, mostly found in the alluvial plains used for cropping, will be disturbed by construction. Impacts to rocky areas will be one-off and permanent, and are overall expected to be minimal.
Impacts on occurrences of human-made structures and non-native vegetation	Fences are present within the Subject Land, typical of a primary production farm, and hold a very low level of habitat for some species like robins. The removal of fences within the landscape will not incur any impact on common or threatened fauna species, and may increase the ability for common fauna species to move within the landscape through the removal of regular barriers. Non-native vegetation within the Subject Land is associated with grazing and cropping, with these areas comprised of exotic pastures and agricultural dryland crops. Some threatened raptor species have the potential to forage in non-native vegetation within the Subject Land. The installation of solar panels will not entirely remove the exotic grassland as a foraging resource for these species, with grassy habitat remaining beneath panels Impacts on occurrences of human-made structures and non-native vegetation will be one-off and permanent, and are overall expected to be minimal.
Impacts on corridors or other areas of connectivity linking habitat for threatened entities	Connectivity of habitat within the Subject Land to broader areas within the landscape occurs in two main forms, woodland and watercourses. Connectivity features provide breeding, foraging and dispersal resources for terrestrial and arboreal mammals, flying mammals, and avifauna. Existing barriers to the movement of ground dwelling species include local roads and the Golden Highway. The loss of native vegetation and habitat has the potential to affect landscape connectivity permanently or temporarily during construction. The extent of this impact is considered to be relatively low due to the retention of key habitat connectivity features. Connectivity and gene flow of TECs and identified threatened flora will remain largely intact with key vegetation retained along Sandy Creek, Laheys Creek, hillcrests and road reserves.
Impacts on water bodies or any hydrological processes that sustain threatened entities	No significant alterations to hydrology and drainage lines are anticipated. Sandy Creek and Laheys Creek are mapped as Key Fish Habitat by the NSW Department of Primary Industries (DPI). These watercourses are classified as habitat for the threatened Southern Purple-spotted Gudgeon *Mogurnda adspersa* (DPI, 2022). All watercourses within the Subject Land form part of the catchment for the Talbragar River. Talbragar River is also mapped as habitat for the threatened Eel Tailed Catfish *Tandanus tandanus* (DPI, 2022). Development within Laheys Creek and Sandy Creek has been avoided, with the exception of four proposed waterway crossings where internal access tracks will cross existing waterways. It is proposed to install bridge crossings at these locations, which may result in temporary impacts to creek flow and sedimentation during construction. No fish habitat will be lost. PV arrays are only proposed over first Strahler Stream Order (SSO) one streams within the Subject Land. These undefined, unnamed watercourses

Prescribed impact	Description
	have been subject to historic disturbance from cropping and grazing and are largely devoid of native vegetation. These watercourses are generally unlikely to host fish habitat. Approximately 45 dams occur within the Subject Land, providing minor habitat connectivity for common waterbird species such as ducks and cormorants as they move nomadically within the landscape. The dams provide permanent water and are utilised by common fauna species including turtles. Around 31 of the approximately 45 dams are proposed for removal. Overall, the Project is expected to minimally impact on water bodies or any hydrological processes that sustain threatened entities.
Impacts where the proposed development may result in vehicle strike on threatened fauna or on animals that are part of a threatened ecological community	The Project will result in increased light and heavy vehicle traffic during construction. This increased vehicle traffic has the potential to temporarily impact upon native fauna species that are active during the day, during construction working hours. The potential for vehicle strikes can be effectively managed through driver awareness training, as well as on-site measures such as speed limits and signage and education programs for staff. As such, the Project is not expected to result in any substantial impacts associated with vehicle strikes outside of what already exists due to the Project's proximity to a major regional road corridor and network of local and regional roads.

Operation

Direct impacts

Direct impacts are anticipated to be minimal during the operation of the Project, with the clearing of native vegetation to be limited to construction and minor ongoing maintenance activities (e.g. maintenance of asset protection zones). Native ground cover disturbance under the solar arrays is expected to be temporary in nature, with native ground cover able to regenerate and persist throughout operations.

The bridges to facilitate waterway crossings will remain in use for the life of the Project. The bridge structures will span each waterway, avoiding direct instream disturbance to potential fish habitat during operation. Temporary, minor direct impacts may occur in the event of bridge maintenance activities.

Erosion and sedimentation may occur in the event of poor site stabilisation and/or re-establishment of ground cover. These risks are anticipated to be limited and manageable (refer to **Section 6.5** for further detail)

Indirect impacts

A summary of potential operation-related indirect impacts arising from the Project are outlined in **Table 6-10**. Overall, potential indirect impacts during the operation of the Project have been assessed as low to moderate.

Table 6-10 Summary of indirect impacts during operation

Potential indirect impact	Description
Inadvertent impacts on adjacent habitat or vegetation	Inadvertent impacts are always a possibility, though these will be managed during operation by the application of the following: • no ongoing clearing is proposed within the Development Footprint • lighting directed towards the Development Footprint, rather than towards adjacent retained habitat • management of stormwater away from adjacent retained habitat • implementation of erosion and sediment controls.

Potential indirect impact	Description
	The BDAR identified inadvertent impacts on adjacent habitat or vegetation as a low potential impact.
Reduced viability of adjacent habitat due to edge effects	There is the potential for a marginal increase in edge effects to persist during operation, associated with: • removal of adjacent native vegetation within the Development Footprint during construction • increases in the distance between scattered trees and HBTs, following removal of scattered paddock trees during construction The BDAR identified the reduced viability of adjacent habitat due to edge effects as a low potential impact.
Reduced viability of adjacent habitat due to noise, dust or light spill	The Project has retained most large patches of vegetation in the Subject Land through avoidance of hillcrests and hills. Dust impacts associated with operation are anticipated to be negligible. Lighting will be directed towards the Development Footprint, rather than towards adjacent retained habitat. Although there will be an increase in noise relative to the existing agricultural environment, fauna species are likely to become habituated to these changes while utilising retained habitat. Noise, dust and light spill impacts on adjacent habitat during operation are expected to be low.
Transport of weeds and pathogens from within the development footprint to adjacent vegetation	Weeds within the Development Footprint were observed to be consistent with those occurring within the retained adjacent vegetation. The increased transport of pathogens and weeds between the Development Footprint and adjacent vegetation is considered unlikely to occur during operation, with potential impacts expected to be low.
Increased risk of starvation, exposure and loss of shade or shelter	Indirect impacts are largely associated with increased competition for suitable habitat and foraging areas, and associated potential for increased risk of starvation, exposure and loss of shade or shelter. The removal of HBTs will increase hollow competition for common fauna species within the landscape. Connectivity will remain throughout areas of retained vegetation minimising impacts to threatened species from loss of suitable habitat and foraging areas. This includes retaining connectivity of habitat within the Development Footprint set back from the two key waterway areas, with selective crossings proposed. The BDAR identified increased risk of starvation, exposure and loss of shade or shelter as a low-moderate potential impact.

Prescribed impacts

Potential prescribed biodiversity impacts associated with operation of the Project are summarised in **Table 6-11**.

Table 6-11 Summary of prescribed impacts during operation

Prescribed impact	Description
Impacts on karst, caves, crevices, cliffs, rocks and other geological features of significance	No operational impacts on karst, caves, crevices, cliffs, rocks and other geological features of significance are anticipated as construction impacts will be one-off and permanent.
Impacts on occurrences of human-made structures and non-native vegetation	No operational impacts on occurrences of human-made structures and non-native vegetation are anticipated as construction impacts will be one-off and permanent.

Prescribed impact	Description
Impacts on corridors or other areas of connectivity linking habitat for threatened entities	The extent of this impact is considered to be relatively low due to the retention of key habitat connectivity features. Connectivity and gene flow of TECs and identified threatened flora will remain largely intact with key vegetation retained along Sandy Creek, Laheys Creek, hillcrests and road reserves.
Impacts on water bodies or any hydrological processes that sustain threatened entities	No significant alterations to hydrology and drainage lines are anticipated. Bridge structures may result in some disruption to water flow during high flow events and minor changes in flood extents (refer to **Section 6.9** for further detail), however this is unlikely to affect threatened entities.
Impacts where the proposed development may result in vehicle strike on threatened fauna or on animals that are part of a threatened ecological community	The Project will result in minor operational vehicle traffic. The potential for vehicle strikes can be effectively managed through driver awareness training on the potential for fauna to occur. As such, the Project is not expected to result in any substantial or significant impacts associated with vehicle strikes outside of what already exists due to the Project's proximity to a major regional road corridor and network of local and regional roads.

Biodiversity offsets

The offset requirement for the Project was calculated using the BAM Calculator. The results of this assessment indicated the need for offsets to account for unavoidable residual impacts to:

- Eight PCTs (ecosystem credits) due to native vegetation clearing
- One species credit species due to:
  - Direct and indirect impacts on Pine Donkey Orchid
- Scattered paddock trees, including 56 Class two scattered trees and 110 Class three scattered trees.

Table 6-12 and **Table 6-13** provide a summary of the expected offset liability, assuming a 100% loss of biodiversity values beneath solar arrays. However, native ground cover disturbance under the solar arrays is expected to be temporary in nature and native ground cover will be able to regenerate and persist throughout operation.

In order to secure the required biodiversity offsets the Proponent has commenced investigations into the establishment of local Biodiversity Stewardship Sites. These offsets will be obtained and retired prior to the commencement of construction.

Further detail on offsetting obligations and options is discussed in **Appendix G (Biodiversity Development Assessment Report)**.

Table 6-12 Summary of Project offset requirements – ecosystem credits

Biodiversity value	Offset trading group	Area impacted (ha)	Credits required
PCT 81	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	31.6	747
PCT 201	Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	8.71	362
PCT 281	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Box-Gum Woodland)	51.56	1,239

Biodiversity value	Offset trading group	Area impacted (ha)	Credits required
PCT 440	Western Slopes Dry Sclerophyll Forests - < 50% cleared group (including Tier 4 or higher threat status)	9.97	288
PCT 467	Western Slopes Dry Sclerophyll Forests - < 50% cleared group (including Tier 4 or higher threat status)	87.38	1,092
PCT 468	Western Slopes Dry Sclerophyll Forests - < 50% cleared group (including Tier 4 or higher threat status)	3.97	83
PCT 478	Western Slopes Dry Sclerophyll Forests - < 50% cleared group (including Tier 4 or higher threat status)	1.00	16
PCT 599	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Box-Gum Woodland)	56.88	0*

* In accordance with Section 9.2.1 of the BAM offsets are not required for impacts to vegetation zones that have a vegetation integrity score of <17, if the PCT is linked to threatened species habitat, or represents a vulnerable ecological community. Similarly, offsets are not required if the vegetation integrity score is <15, where the PCT represents an endangered or critically endangered ecological community. This is applicable to PCT 599 which has a vegetation integrity score of 14.4 therefore, the credits required for offsetting is zero.

Table 6-13 Summary of Project offset requirements – species credits

Species	Area impacted (ha)	Credits required
Pine Donkey Orchid	3.5	91

6.2.5 Management and mitigation measures

Avoidance

Following receipt of the SEARs, Supplementary SEARs and extension, the Project has continued to be developed and refined to avoid and minimise impacts (including prescribed impacts) to biodiversity values. A range of strategies have been employed throughout the Project's conception and development to avoid, minimise, and offset potential impacts. These include:

- **Project Area selection:** selection of the Project Area was conducted with a focus on minimising impacts to sensitive receivers and the environment:
  - The selected site covers part of the area that was previously approved for the Cobbora Coal Project, an open-cut coal mine proposed by Cobbora Holding Company Pty Limited, a state-owned entity.
  - The extensive cropped and cleared areas in the lowland plains mapped as Category 1 - Exempt Land were compatible with the proposed Project.
  - Areas with high potential for biodiversity including hillcrests will be avoided by the Project due to incompatibility of infrastructure.
- **Alternative Development Footprints:** based on early consideration of constraints and impacts, substantial effort has been focused on re-siting the Development Footprint (the potential disturbance footprint) to avoid areas of higher biodiversity value:
  - Following the completion of the initial survey effort and targeted surveys by Biosis in 2022 and 2023, a constraints model was completed based on several environmental parameters. This constraints model was utilised refine the proposed Development Footprint.
  - A priority focus was placed on avoidance and reducing impacts for intact Box-Gum Woodland TEC and Inland Gey Box TEC that meet the Matters of National Significance (MNES) criteria, maintaining connectivity through the landscape, as well as minimising impacts to more optimal habitats for species.

- A considerable effort has been made to avoid and minimise impacts to the highest value areas of these TECs, with the Development Footprint avoiding most high and moderate areas. The majority of impacts to TECs occur on low condition areas.
- The Subject Land was refined and reduced to exclude some fringing areas of vegetation associated with hillcrests and slopes.
- The Subject Land was reduced in several areas to remove proposed development away from Sandy Creek and along several areas of Laheys Creek.
- These refinements have reduced impacts to native vegetation from approximately 350 ha to 250 ha, and impacts to EPBC Act TECs from approximately 23 ha to 15.8 ha.

Management and mitigation

Management and mitigation measures to avoid, minimise, or manage potential biodiversity impacts as a result of the Project are detailed in **Table 6-14.**

Table 6-14 Management and mitigation measures – biodiversity

ID	Management and mitigation measure	Timing
B1	Exclusion zones will be identified and delineated on site (around the woodland areas, native vegetation and threatened flora).	Construction
B2	Construction areas, not required for operational purposes, will be progressively rehabilitated following completion of construction works.	Construction
B3	Protection for fauna mortality due to entrapment within cable trenching will be minimised by: • Minimising to the extent practicable the period the trench is open • Providing opportunities for fauna to egress the trench, such as trench plugs or other appropriate mechanisms • Regular inspection of open trenches by suitably qualified personnel to remove trapped fauna as required, and prior to commencement of works if trenches were left open overnight.	Construction
B4	A Biodiversity Management Plan (BMP) will be prepared and implemented as part of the CEMP including: • Protocols to monitor the vegetation condition and habitat values of any such retained vegetation • Plans showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features and revegetation areas • Protocols for pre-clearance inspections in areas of threatened flora by a suitably qualified ecologist. • Protocols for clearing of woody vegetation with a suitably qualified spotter/catcher present • Protocols for a suitably qualified ecologist or licensed handler to manage and handle unexpected or injured fauna • Provisions for corrective actions should a decline in vegetation or habitat condition be detected • Prescriptions for the protection and ongoing management of the occurrences of Pine Donkey Orchid within the Development Footprint. • The BMP will consist of relevant subplans, including but not limited to vegetation management plan, and fauna management plan.	Construction

ID	Management and mitigation measure	Timing
B5	A Biodiversity Management Plan (BMP) will be prepared and implemented as part of the OEMP including: • Protocols to monitor the vegetation condition and habitat values of any such retained vegetation • Plans showing exclusion zones, protected habitat features and revegetation areas • Provisions for corrective actions should a decline in vegetation or habitat condition be detected • Prescriptions for the protection and ongoing management of the occurrences of Pine Donkey Orchid within the Development Footprint.	Operation
B6	A protection zone will be applied for all watercourses within the Development Footprint to protect remaining riparian vegetation from being impacted by the construction and operation of the Project. Riparian corridor widths and activities permitted within those zones will be in line with the *Water Management Act 2000* (NSW) and relevant guidelines.	Construction and Operation
B7	Earthworks associated with waterway crossing construction will only take place during periods of low/no flow periods to minimise disturbance and prevent poor downstream water quality. Fish passage will be maintained throughout the construction process utilising guidance from DPI Policy and guidelines for fish habitat conservation and management (2013). Waterway crossings will be consistent with relevant guidance including the *Guidelines for watercourse crossings on waterfront land* (DPE 2022).	Construction
B8	A Biosecurity Management Plan will be prepared, including hygiene protocols, material inspections, and monitoring programs.	Construction and Operation

6.3 Aboriginal heritage

6.3.1 Secretary's Environmental Assessment Requirements

Table 9-1 sets out the SEARs relevant to Aboriginal heritage and where the requirements have been addressed in this EIS.

Table 6-15 SEARs – Aboriginal heritage

Relevant SEARs	
Aboriginal heritage	**Where addressed**
The EIS must address the following specific matters: • an Aboriginal Cultural Heritage Assessment Report (ACHAR) prepared in accordance with the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011) and the Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW (DECCW, 2010), identifying, describing, and assessing any impacts to any Aboriginal cultural heritage sites or values associated with the site and adjoining haulage routes (including impacts from any proposed earthworks, construction works, and road works), and including results of archaeological test excavations (where required), undertaken in accordance with the relevant standards and requirements;	• An ACHAR has been prepared and is attached as **Appendix K (Aboriginal Cultural Heritage Assessment Report)**
• evidence of consultation with Aboriginal communities in determining and assessing impacts, identifying and	• Consultation with Aboriginal communities is discussed in

Relevant SEARs	
selecting options for avoidance of Aboriginal cultural heritage and identifying appropriate mitigation measures (including the final proposed measures), having regard to the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010) including the consultation process outlined within.	the ACHAR and in **Section 6.3.2**

6.3.2 Methodology

An ACHAR was prepared by OzArk Environment and Heritage to assess potential Aboriginal cultural heritage impacts associated with the construction and operation of the Project. This report is attached in **Appendix K (Aboriginal Cultural Heritage Assessment Report)**. The ACHAR has been carried out in accordance with the following guidelines:

- Code of Practice for the Investigation of Aboriginal Objects in New South Wales (DECCW, 2010)
- Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH, 2011)
- The Aboriginal cultural heritage consultation requirements (ACHCRs) for Proponents (DECCW, 2010).

The ACHAR methodology for the Project included:

- **A desktop-based assessment of the Project Area** – A desktop assessment reviewed the landscape context of the Project Area, with specific consideration of its potential for past Aboriginal land use and the survival of associated archaeological materials. This included a search of publicly available databases, reports and map data, and the preparation of a predictive model for the Aboriginal archaeological record of the Project Area. The results of previously completed archaeological test excavations were also used to define the archaeological values of the Project Area
- **An archaeological survey of the Project Area** – An archaeological survey was carried out between 27 June 2022 and 1 July 2022 with the assistance of RAP representatives. An additional survey was undertaken on 11 and 12 August 2022 to ensure adequate sampling was completed. The Project Area and Development Footprint have since been reduced, and as a result, the archaeological survey covered a larger area than the Development Footprint. For the purposes of the assessment, this larger area is referred to as the 'Surveyed Area' (refer to **Figure 6-5**).

  Aboriginal cultural heritage values were identified and recorded within the Surveyed Area. This included intangible cultural values, Aboriginal objects, and any landforms likely to contain further archaeological deposits.

  The significance of any recorded Aboriginal cultural values, Aboriginal objects, or sites were assessed in consultation with RAPs and any potential impacts to Aboriginal cultural heritage values identified. Suitable management recommendations were then developed to avoid or mitigate potential impacts.

Aboriginal community consultation

The ACHAR aims at identifying any Aboriginal cultural values that may impacted by the Project so that these can be recognised and protected, where possible. To support this, consultation with Aboriginal community stakeholders has been undertaken in accordance with the ACHCRs for Proponents (DECCW, 2010). Aboriginal community consultation involves four stages:

- Stage 1 – Notification of Project proposal and registration of interest
- Stage 2 – Presentation of information about the proposed Project
- Stage 3 – Gathering information about cultural significance
- Stage 4 – Review of draft cultural heritage assessment report

Consultation was undertaken in two rounds during 2022 and in 2024, due to the lapse in time between the original survey work and the current ACHAR preparation. The following sections detail the ACHCR process undertaken in 2022 (Round 1) and 2024 (Round 2).

Round 1 (2022)

The following individuals or groups registered under Stage 1 to be consulted as RAPs in 2022:

- Dubbo LALC
- Gallangabang Aboriginal Corporation
- Tubbah-Gah (Maing) Wiradjuri Aboriginal Corporation
- Sonione Wakabut Rogers
- Stakeholder 1 (stakeholder has requested to be anonymous)
- Wellington Valley Wiradjuri Aboriginal Corporation
- Woka Aboriginal Corporation.

During Stage 2, all RAPs were presented with detailed Project information (on 26 May 2022) outlining the assessment methodology. This information outlined the archaeological context of the Project Area, a description of the proposed survey, and asked whether there were any cultural values that should be considered in the assessment. No responses were received.

Stage 3 included a field survey undertaken with the assistance of RAPs between 27 June 2022 and 1 July 2022. An additional survey was undertaken on 11 and 12 August 2022. Subsequently, the Project was placed on hold and Stage 4 was not completed at this time.

Round 2 (2024)

Due to the lapse in time between the original survey work and the current ACHAR preparation, Aboriginal community consultation was restarted from Stage 1 in 2024. The following groups or individuals registered under Stage 1 to be consulted as RAPs as part of Round 2:

- Booral Maliyan
- Brian Draper
- Dubbo LALC
- Gallangabang Aboriginal Corporation
- Geoff Toomey
- George Flick
- Michael Long
- Paul Brydon
- Thomas Dahlstrom
- Tubbah-Gah (Maing) Wiradjuri Aboriginal Corporation
- Sonione Wakabut Rogers
- Stakeholder 1 (stakeholder has requested to be anonymous)
- Stakeholder 2 (stakeholder has requested to be anonymous)
- Wellington Aboriginal Action Panel
- Wellington Valley Wiradjuri Aboriginal Corporation
- Wiradjuri Council of Elders.

Most of the individuals and groups that registered as part of Round 1 reregistered for the Project. Those individuals and groups who had previously registered for the project in Round 1, but did not register for Round 2 were included in all Round 2 correspondence for transparency.

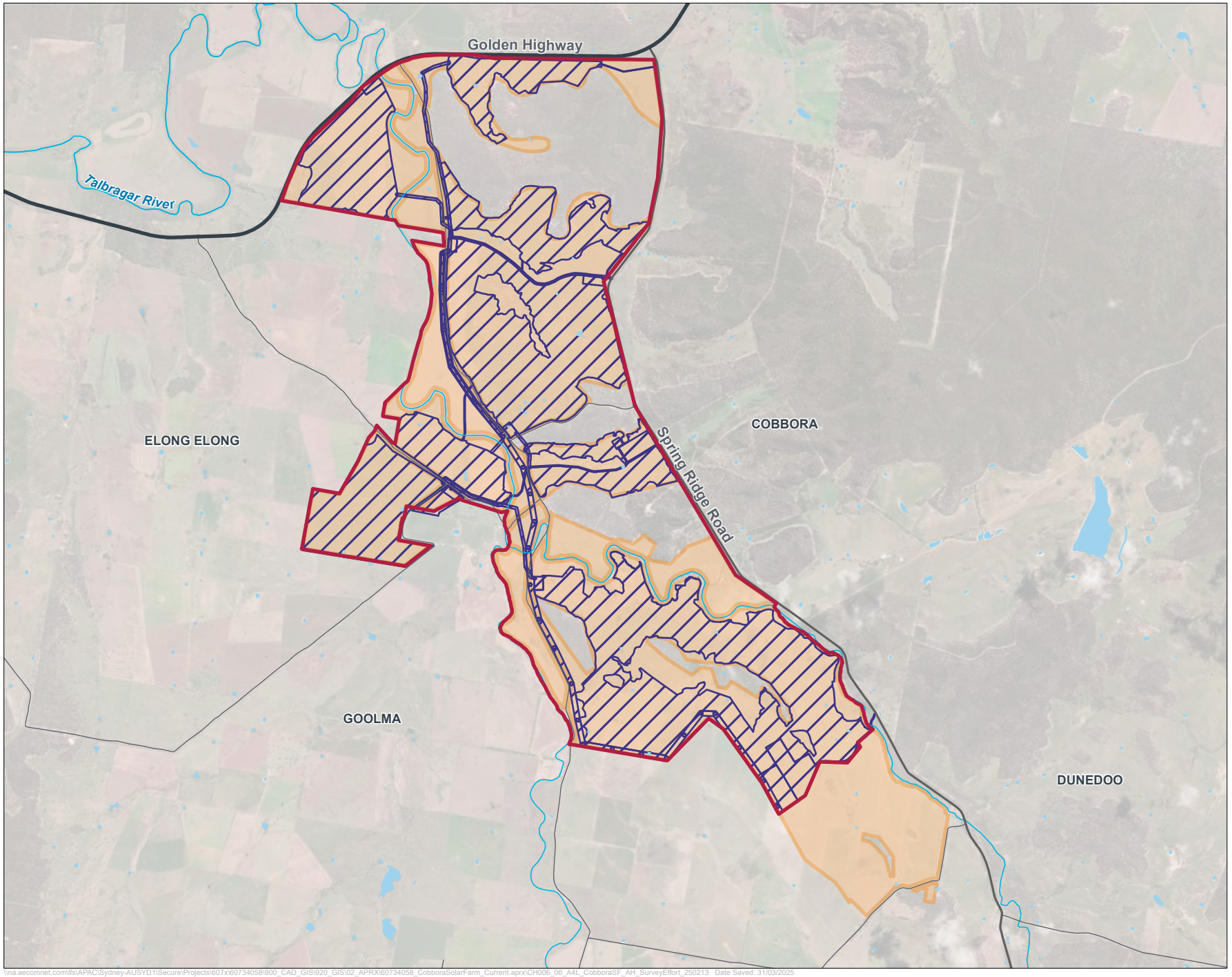
Detailed Project information and the methodology for the assessment were provided to all RAPs in a letter as part of Stage 2 (issued on 27 September 2024). This letter provided the archaeological context of the Project Area, a description of the previous 2022 survey and asked whether there were any cultural values that should be considered in the assessment.

RAPs were provided 28 days in which to review and comment on the assessment methodology, as required by Stage 3 of the ACHCRs. Three responses were received from Woka Aboriginal Corporation, Booral Malyian, and Wellington Valley Wiradjuri Aboriginal Corporation stating that they had reviewed and supported the methodology. No other correspondence was received during Stage 3.

Stage 4 of the ACHCRs involves issuing the draft ACHAR to all RAPs for their consideration. A draft of the ACHAR was sent to all RAPs on 21 February 2025 with a closing date of 21 March 2025. Five responses were received from Geoff Toomey, Stakeholder 2, the Wiradjuri Council of Elders, Booral Maliyan and Wellington Valley Wiradjuri Aboriginal Corporation by the closing date for comment (refer to Appendix 1 of **Appendix K (Aboriginal Cultural Heritage Assessment Report)**.

Three of the responses supported the findings of the ACHAR, and two responses provided further recommendations for the ACHAR. The recommendations made within these responses have been implemented into the final ACHAR where applicable and appropriate.

The final version of the ACHAR was sent to all RAPs on 31 March 2024.



AECOM

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0 0.5 1 km

Legend

- Project Area
- Development Footprint
- Cadastral boundary
- Surveyed Area
- Waterbody
- Watercourses
- Motorway
- Main road
- Local road

FIGURE 6-5: SURVEY EFFORT

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Source: Earthstar Geographics

6.3.3 Existing environment

Landscape context

Topography and hydrology

The Project Area is located within the Brigalow Belt South biogeographic region of NSW. This area is dominated by gently undulating landforms and will have been hospitable to Aboriginal people, especially due to the proximity to Laheys and Sandy Creeks. Gently sloping elevated landforms situated along these creeks will have been an attractive environment for longer-term occupation. Crests and ridgelines may have been navigated as travelling routes or for gathering specific resources.

Geology and soils

Landforms which typically comprise outcropping rock, i.e. ridges, are found within the Project Area, however, none are located within the Development Footprint. Soils present on the gentle slopes towards the creeks and ephemeral drainage lines are likely to have been affected by water erosion and are poor draining. The erosional qualities of the soils present will have influenced the likelihood of in situ archaeological deposits being present. Additionally, the widespread and comprehensive use of most of the Project Area for cultivation will have caused further soil erosion and loss.

Vegetation

The Project Area will have once supported an open woodland, which will have provided some resources for Aboriginal subsistence. However, resources likely to have supported a large population of people will have been more common closer to the banks of permanent water sources.

The broad-scale vegetation clearance which has taken place across the Project Area for agricultural purposes reduces the likelihood that any culturally modified trees remain present. However, aerial imagery of the Project Area also indicates remnant mature trees may be present, particularly along moderate slopes and drainage lines. Furthermore, 19 culturally modified tree sites were found as part of the Aboriginal Heritage Information Management System (AHIMS).

Land use

The Project Area has been subject to significant historical disturbance in the form of vegetation clearance, cultivation, and grazing. An aerial from 1964 which covers the Project Area shows there has been little change in terms of land use over the past 60 years. These activities are likely to have displaced Aboriginal objects or removed some site types entirely (e.g. culturally modified trees). Additionally, cultivation reduces the potential for intact subsurface archaeological material to remain. In areas where farming and agriculture are less intensive, Aboriginal objects such as isolated finds and low-density artefact scatters such as stone artefacts, stone hearths, and bones which may be present in a different context due to erosion and slope wash (the movement of soil or debris down a slope).

Archaeological context

Ethno-historic sources of regional Aboriginal culture

The Project Area is situated within the boundaries of the Wiradjuri tribal and linguistic group, being one of the largest language groups within NSW. The Project Area is located within the central tablelands and on the eastern margin of the Wiradjuri territory. While the area is noted to have a single basic language, the boundaries of the language group are non-static and various dialects could be found throughout the region (Tindale, 2000).

Regional archaeological context

Surveys of the surrounding Dubbo region have found artefact scatters, modified trees, and grinding grooves as the most frequently occurring site types. The location and size of archaeological sites in this area appear to be determined by various environmental and social factors, such as proximity to water, the underlying geology, and the availability of food resources. The results of previous archaeological studies surrounding the Project Area indicate the following:

- Stone artefact sites (isolated finds and artefact scatters) are the most frequently recorded site types in the area, with the higher density sites concentrated within 200 m of permanent watercourses and 50 m of ephemeral drainage lines

- Modified trees are a frequently recorded site type in the region
- Sites indicative of occupation and repeated use, such as hearths and grinding grooves, are largely associated with permanent watercourses
- Away from watercourses, sites are generally recorded along transitional boundaries, for example, where ranges join plain landforms or vegetation type changes.

Local archaeological context

Table 6-16 details previously recorded Aboriginal heritage places within and around the Project Area identified as part of the desktop-based assessment.

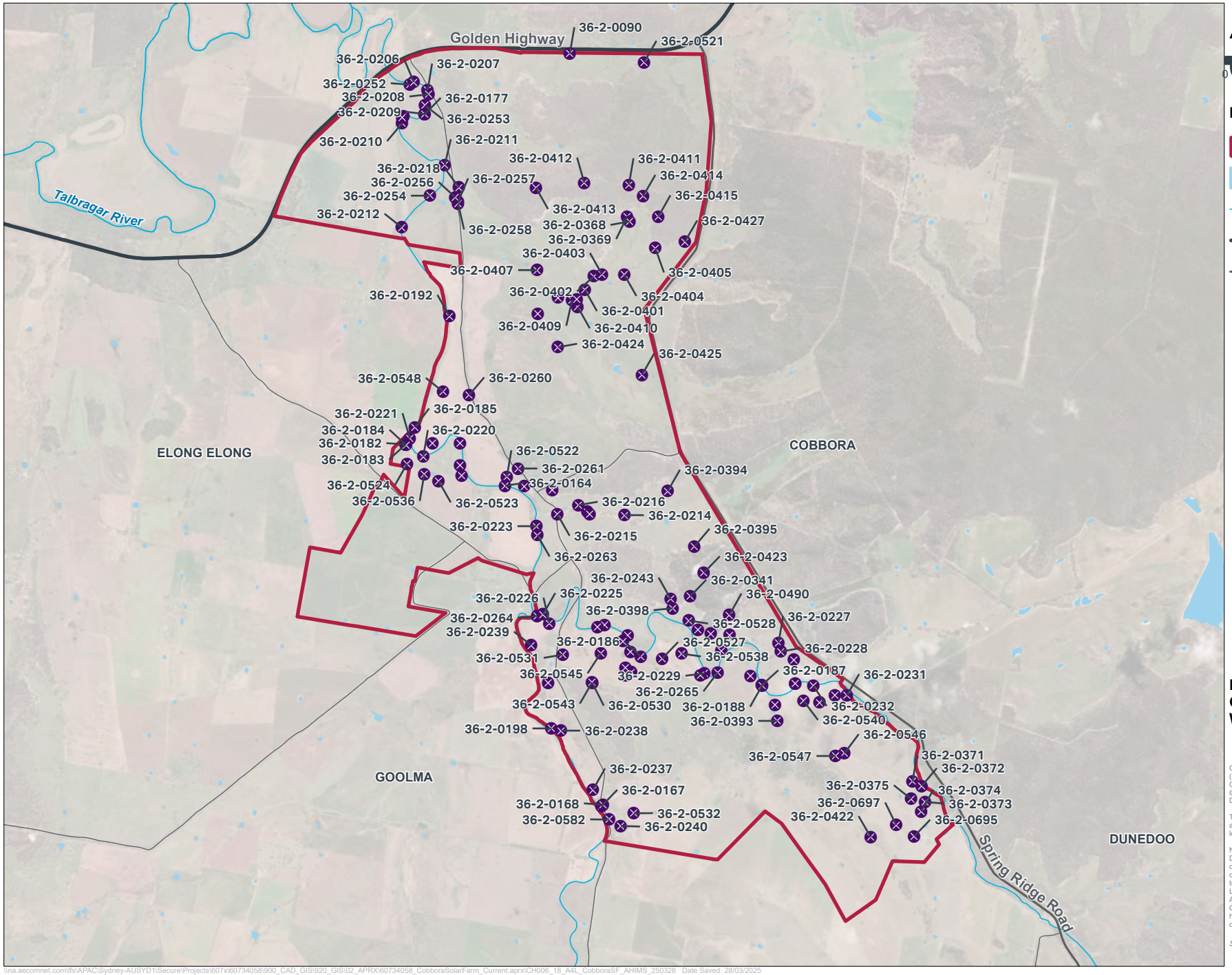
Table 6-16 Aboriginal cultural heritage desktop database search results

Name of database searched	Date of search	Area of search	Comment
Commonwealth Heritage Listings	05/09/2024	Dubbo and Warrumbungle LGAs	No places listed on either the National or Commonwealth heritage lists are located within the Project Area relating to Aboriginal cultural heritage
National Native Title Claims Search	05/09/2024	NSW	No Native Title Claims cover the Project Area.
AHIMS (Aboriginal Heritage Information Management System) (NSW)	28/04/2022	16 x 16 km centred on the Project Area	173 sites within 16 x 16 km area centred on the Project Area. 104 sites were recorded within the Surveyed Area (Project Area in 2022 before it was reduced, refer to **Section 6.3.2**).
	05/09/2024	10 x 10 km centred on the Project Area	220 sites within a 10 x 10 km area centred on the Project Area. 136 sites are located within the Project Area.
Local Environmental Plan (LEP)	05/09/2024	Dubbo Regional LEP 2022 and Warrumbungle LEP 2013	None of the Aboriginal places noted occur within or near the Project Area.

The AHIMS sites identified in the desktop assessment included artefact sites (isolated finds and artefact scatters), artefact sites with potential archaeological deposits (PADs), culturally modified trees, hearths, grinding grooves, hearths, and habitation structures.

There is a general tendency for AHIMS sites to be located along watercourses, with concentrations recorded along Laheys and Sandy Creeks (refer to **Figure 6-6**). Where sites are located at a distance from water (such as the habitation structures, grinding grooves, and culturally modified trees), they are most commonly situated along ridgelines (refer to **Appendix K (Aboriginal Cultural Heritage Assessment Report)**).

A total of 137 AHIMS registered sites were recorded within or extending into the Project Area along with 32 PADs within the Project Area. 22 of these sites are located wholly or partially within the Development Footprint (**Table 6-18**).



AECOM

0 N 1 2 km

Legend

- Project Area
- Waterbody
- Watercourses
- Motorway
- Main road
- AHIMS sites

FIGURE 6-6: ABORIGINAL CULTURAL HERITAGE SITES WITHIN THE PROJECT AREA

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Source: Earthstar Geographics

The significance of sites recorded within the Development Footprint was assessed based on their social or cultural value, archaeological or scientific value, aesthetic value, and historic value. A summary of these values is provided in **Table 6-17**.

Table 6-17 Ratings of significance for Aboriginal cultural heritage sites

Value	Significance assessment
Cultural or social	Cultural and social values can only be determined by the local Aboriginal people. Generally, however, all sites hold value to the Aboriginal community. Places of social or cultural value have associations with contemporary community identity. These places can have associations with tragic or warmly remembered experiences, periods, or events. All recorded sites in the Development Footprint have been preliminarily classified as having high social or cultural value.
Scientific/archaeological	Scientific (archaeological) value refers to the importance of a landscape, area, place or object because of its rarity, representativeness, and the extent to which it may contribute to further understanding and information. The research potential of the surface Aboriginal heritage sites is generally considered low for recorded sites within the Development Footprint.
Aesthetic	Aesthetic value refers to the sensory, scenic, architectural, and creative aspects of the place. It is often closely linked with the social values. While the recorded sites within the Development Footprint lack specific aesthetic values, the views associated with Sandy Creek and Laheys Creek add some visual importance.
Historic	Historic value refers to the associations of a site or place with a historically important person, event, phase, or activity in an Aboriginal community. None of the recorded Aboriginal heritage objects within the Development Footprint have a direct connection to known historical Aboriginal sites, leading to their assessment as having low historic value.

Based on Aboriginal community consultation, no specific cultural values relating to the Project Area have so far been identified by the RAPs. However, the strong cultural values of Aboriginal communities towards landscapes and cultural heritage sites are recognised (refer to **Section 6.3.2**).

6.3.4 Impact assessment

Impacts on Aboriginal cultural heritage can be either direct or indirect. Direct impacts include the removal, modification or destruction of an Aboriginal site. Indirect impacts may arise form secondary effects such as construction vibration, or through impacts to a site's setting (visual impacts, changes to vistas/landscapes) and/or changes to ongoing use or environmental relationships. The following sections discuss the potential impacts that may occur as a result of the construction and operation of the Project.

Construction

The Project has been designed to avoid impacts to recorded sites and PADs within the Project Area as far as practical. This has been achieved through expanding archaeological exclusion zones and a redesign of project components such as altering the Development Footprint to conserve identified Aboriginal sites.

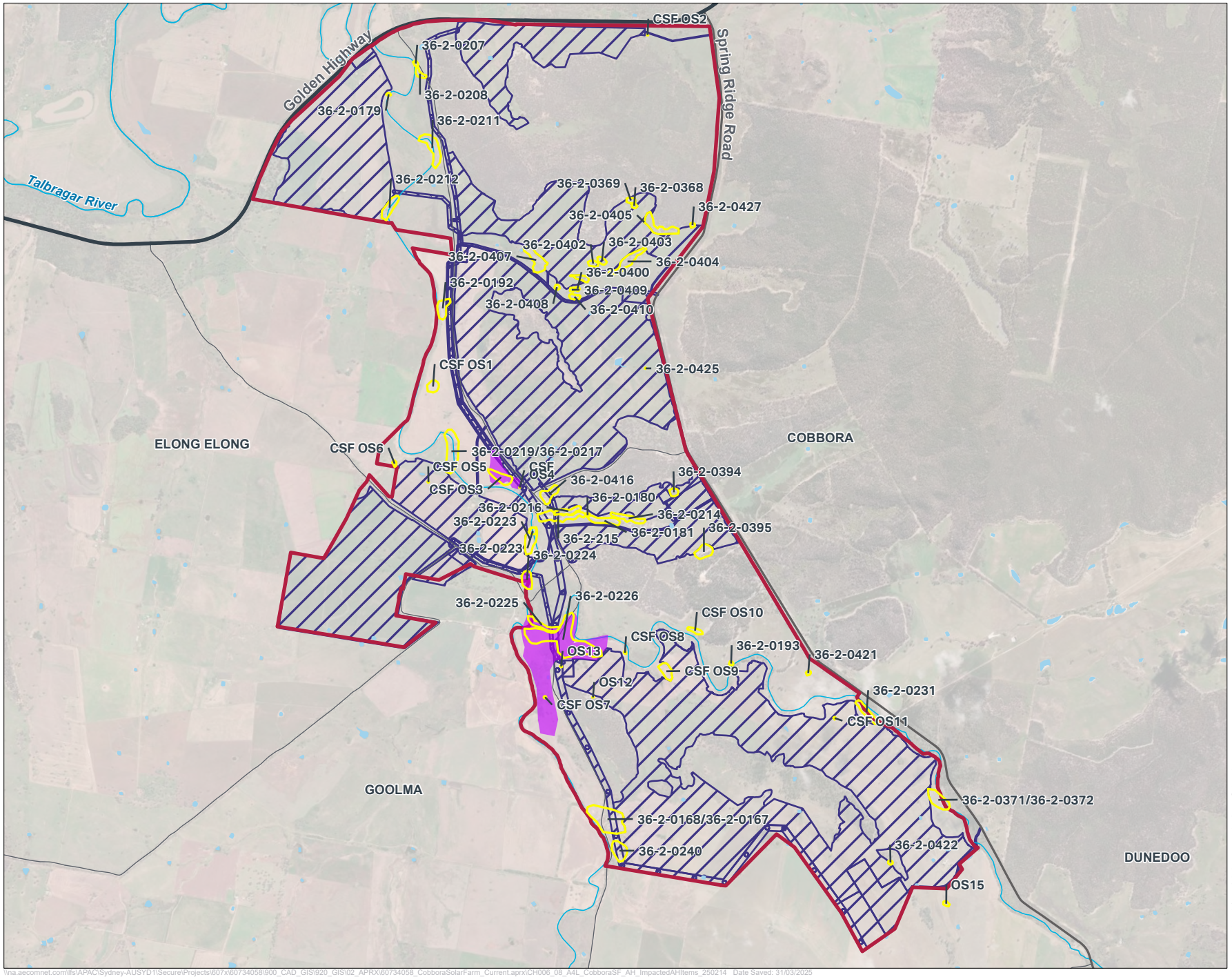
Despite this, out of the 137 AHIMS registered sites in the Surveyed Area, 22 are likely to be affected by construction of the Project, including discreet portions of three PAD sites. The 22 sites include nine isolated finds and 13 artefact scatters. 18 of these 22 sites are located wholly within the Development Footprint and will therefore be subject to a total loss of value. Four sites partially intersect with the Development Footprint and will be subject to a partial loss of value. The three PAD sites will be partially affected by the installation of electrical infrastructure. These Project infrastructure items are subject to detailed design, which will seek to avoid impacts to these sites as far as practicable. If avoidance is not possible excavation of the discreet areas will likely be required.

The 22 sites within the Development Footprint are unable to be conserved as a result of construction activities. Twenty of these sites have been assessed as being of low scientific value, one of moderate scientific value, and one of high scientific value (SAC 23). Of the three PADs that will be partially impacted, one has been assessed as having high scientific value (associated with SAC 23). The scientific values of the other two PADS are not yet known, however both are associated with sites assessed as having low scientific value. A summary of potential impacts to Aboriginal cultural heritage items associated with construction of the Project are summarised in **Table 6-18** and shown on **Figure 6-7**.

Table 6-18 Potential construction impacts to Aboriginal cultural heritage items

AHIMS ID	Site Name	Site type	Degree of harm[1] (total/partial loss of value)
36-2-0196	IF 01-Glass Flake	Artefact scatter	Partial
36-2-0196	IF 05-Ground Edge Axe	Isolated find	Total
36-2-0215	SAC 12	Artefact scatter with PAD	Partial
36-2-0216	SAC 13	Artefact scatter with PAD	Partial
36-2-0226	SAC 23	Artefact scatter with PAD	Partial
36-2-0393	CBR - OS – 21	Isolated find	Total
36-2-0402	CBR - OS - 13B	Artefact scatter	Total
36-2-0403	CBR - OS - 13A	Artefact scatter	Total
36-2-0425	CBR - IF – 01	Isolated find	Total
36-2-0536	CSF IF03	Isolated find	Total
36-2-0538	CSF IF05	Isolated find	Total
36-2-0541	CSF IF09	Isolated find	Total
36-2-0542	CSF IF10	Isolated find	Total
36-2-0544	CSF IF12	Isolated find	Total
36-2-0545	CSF IF13	Isolated find	Total
36-2-0547	CSF IF14	Isolated find	Total
36-2-0546	CSF IF15	Isolated find	Total
36-2-0523	CSF OS5	Artefact scatter	Total
36-2-0529	CSF OS11	Artefact scatter	Total
36-2-0532	CSF OS14	Artefact scatter	Total
36-2-0695	SNI-AS48	Artefact scatter	Total
36-2-0697	SNI-AS47	Artefact scatter	Total
-	PAD 11	PAD	Partial
-	PAD 19	PAD	Partial
-	PAD 20	PAD	Partial

[1] Refers to cultural or social, scientific (archaeological), aesthetic, and/or historic value (**Table 6-17**)



AECOM

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Legend

- Project Area
- Development Footprint
- Heritage site extents
- Impacted Potential Archaeological Deposit (PAD)
- Waterbody
- Motorway
- Main road
- Local road
- Watercourses

FIGURE 6-7: LOCATION OF IMPACTED ABORIGINAL CULTURAL HERITAGE ITEMS

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Although a partial impact to a site of recorded high scientific value is proposed, overall there will a moderate impact to Aboriginal cultural heritage values within the Project Area. This is due to the large number of Aboriginal sites which have been identified within the surrounding area. The sites to be completely lost are not representative of the type, nor significant to the region. Additionally, no intangible heritage values which have so far been identified within the Project Area will be affected.

The remaining 115 sites within the Project Area will be conserved in the landscape, and the Project will adhere to the Ecologically Sustainable Development (ESD) principles of ensuring that impacts are minimised and that the Aboriginal cultural heritage values within the Project Area are maintained as far as practical. Further detail on ESD principles can be found in **Appendix K (Aboriginal Cultural Heritage Assessment Report)**.

Transport

There are no impacts anticipated on local heritage items from proposed haulage routes (refer to **Section 6.8** for further information on traffic and transport). Additional Aboriginal cultural heritage surveys are proposed at each of the proposed Access Points.

Operation

No direct impacts to Aboriginal cultural heritage are anticipated during the operation of the Project. Potential indirect impacts during operation will relate to changes to the broader landscape character and visual amenity of the Project Area. Overall, these impacts are considered low significance with the exception of one viewpoint requiring mitigation which is discussed further in **Section 6.6**.

6.3.5 Management and mitigation measures

Management and mitigation measures to avoid, minimise, or manage potential Aboriginal cultural heritage impacts as a result of the Project are detailed in **Table 6-19**. A full list of management and mitigation measures for all areas of impact for the Project can be found in **Appendix E (Compilation of Mitigation Measures)**.

Table 6-19 Management and mitigation measures – Aboriginal heritage

ID	Management and mitigation measure	Timing
AH1	The proponent will develop an Aboriginal Cultural Heritage Management Plan (ACHMP), in consultation with the Registered Aboriginal Parties (RAPs) and DPHI (with input from Heritage NSW). The ACHMP will include an unanticipated heritage finds protocol, human remains protocol, and heritage inductions. The ACHMP will include protocols for the long-term management of the Aboriginal sites and/or Aboriginal objects discovered during the course of the Project. The ACHMP must be approved by the DPHI prior to salvage and construction activities occurring.	Construction and Operation
AH2	A protocol will be developed for long-term management of Aboriginal objects, in consultation with the RAPs, including: • The reburial of Aboriginal objects at a location outside of the development footprint. This could include reburying the Aboriginal objects near the location of site 36-2-0490 (Cobbora artefact reburial loc) which contains artefact recovered during previous test excavations. • Movement of the Aboriginal objects from the development footprint to a location within the site extent which will not be impacted by the Project (where applicable) or nearby to the original site location outside of the development footprint. • A RAP group (normally the LALC) nominating themselves to apply for a Care Agreement to be entered into between the RAP group and Heritage NSW.	Construction and Operation

ID	Management and mitigation measure	Timing
AH3	Employees, contractors and subcontractors will be made aware during site inductions of the unanticipated heritage finds protocol, and that it is an offence under the *National Parks and Wildlife Act 1974* to harm or desecrate an Aboriginal object or an Aboriginal place unless that harm has been subject to approval as part of the necessary approvals process.	Construction
AH4	A test excavation program will be developed following detailed design and prior to construction for potentially impacted PADs, in consultation with RAPs. The methodology for the excavation will be finalised following the preparation of a written assessment methodology which will undergo consultation with RAPs following ACHCR protocols.	Detailed design and pre-construction
AH5	Where avoided sites are located within 20 m of the Development Footprint, the site will be protected during construction using high-visibility temporary fencing (such as bunting) and marked as 'no-go' areas on all maps. The temporary fencing must be installed prior to construction commencing and will be supervised by a qualified archaeologist and a representative from the RAPs.	Construction
AH6	A protocol for ongoing consultation with RAPs will be included in the ACHMP, outlining triggers for consultation and for obtaining agreement in relation to ACH issues arising on the Project. This protocol will be developed in consultation with the RAPs.	Construction
AH7	Where avoidance of Aboriginal sites is not practicable, recording and salvage of information and artefacts will be undertaken. The methodology for the collection before construction in a particular area commences, will be finalised after the approvals process as part of the ACHMP, and will include the following measures: • All visible surface artefacts will be flagged in the field • The sites will be photographed after flagging and before recording • Artefact information will be recorded and photographed • An Aboriginal Site Impact Recording Form (ASIRF) will be submitted by the archaeologist detailing the salvage process at the sites.	Detailed design and Construction

6.4 Historic heritage

6.4.1 Secretary's Environmental Assessment Requirements

Table 6-20 sets out the SEARs relevant to historic heritage and where the requirements have been addressed in this EIS.

Table 6-20 SEARs – Historic heritage

Relevant SEARs	
Historic heritage	**Where addressed**
The EIS must address the following specific matters: • assess the impact to historic heritage having regard to the Guidelines for Preparing a Statement of Heritage Impact.	• An assessment of potential impacts to historic heritage is detailed in **Section 6.4.4**.

6.4.2 Methodology

A Historic Heritage Impact Assessment Report (HHAR) was prepared by OzArk Environment & Heritage to assess the impact to historic heritage and is attached in **Appendix L (Historic Heritage Assessment Report)**. The assessment was undertaken having regard to the *Guidelines for Preparing a Statement of Heritage Impact* (DPE, 2023b) and involved the following methodology:

- A desktop search of the statutory and non-statutory historic registers and lists to identify historic heritage items with the potential to be impacted by the Project. Desktop searches included the National and Commonwealth Heritage Lists, State Heritage Register, and State Heritage Inventory (Local Environmental Plans/state agency registers)
- A desktop review to develop an understanding of the existing environment
- A field survey undertaken over one week from 27 June to 1 July 2022 and an additional survey undertaken on 11 and 12 August 2022. These surveys provided coverage of the Project Area, as well as the area to the south which was subsequently acquired by EnergyCo for the construction of Elong Elong Energy Hub
- An assessment of the potential impacts of the Project on historic heritage values and identified heritage items during construction and operation
- Recommendation of measures to address potential impacts to historic heritage values.

6.4.3 Existing environment

Historical context

British exploration of the broader Cobbora district began during the early 1800s, motivated by the prospect of the area for grazing cattle and sheep. Agricultural practices of cropping, and particularly sheep and cattle farming, have continued to underpin the primary industry of the Cobbora area.

The town of Cobbora was proclaimed in 1886 and was originally utilised as a crossing along the Talbragar River along the route between Mudgee to Mendooran. For most of the 19th century, the town of Cobbora was considered a regional centre; up until the railway was constructed to Dunedoo in 1910.

Heritage items

A search of the national, state, and local heritage databases, including the Dubbo Regional and Warrumbungle Local Environmental Plans (LEPs), returned no records for historical heritage sites within the Project Area. Previous surveys undertaken in 2012 by EMM as part of the historic heritage assessment for the Cobbora Coal Project also did not identify any items of local heritage significance in the Project Area

The field survey undertaken for the Project in 2022 recorded two historic heritage items within the Project Area, as detailed in **Table 6-21** and shown on **Figure 6-8**. The HHAR considered HS01 and HS04 against *Assessing heritage significance. Guidelines for assessing places and objects against the Heritage Council of NSW criteria* (DPE 2023), and concluded that neither item is of heritage significance. Neither item is listed under the *Heritage Act 1977*.

Table 6-21 Recorded historic heritage items

Heritage Site ID*	Description	Location	Level of significance
HS01 (Mechanical seeder)	The item consists of a Massey Ferguson seeder Sunshine 500 model, possibly dating to the 1950s. The seeder is an early model of the Massey Ferguson Sunshine 500, which is a series still in production today. The item is rusted and in poor condition.	HS01 is located outside of the Development Footprint.	Nil This item is common in rural settings and does not meet the criteria of local or state heritage significance.

Heritage Site ID*	Description	Location	Level of significance
HS04 (House and outbuildings)	The site consists of a house dating within the past 100 years based on its design, the inclusion of electrical components, and presence of fibro sheeting. The building features multiple rooms and a separated granny flat made of wood with a brick chimney and corrugated iron roof. Surrounding the house are numerous outbuildings, sheds, and farming paraphernalia.	The house and outbuildings are located within the Development Footprint. The outbuildings to the southwest of the house are located outside of the Development Footprint	Nil The residence is typical of many small rural dwellings. It is not significant in terms of representativeness or aesthetic values and does not meet the criteria of local or state heritage significance.

* Heritage Site ID reflects numbering used in Appendix L (Historic Heritage Assessment Report) for consistency

6.4.4 Impact assessment

Construction

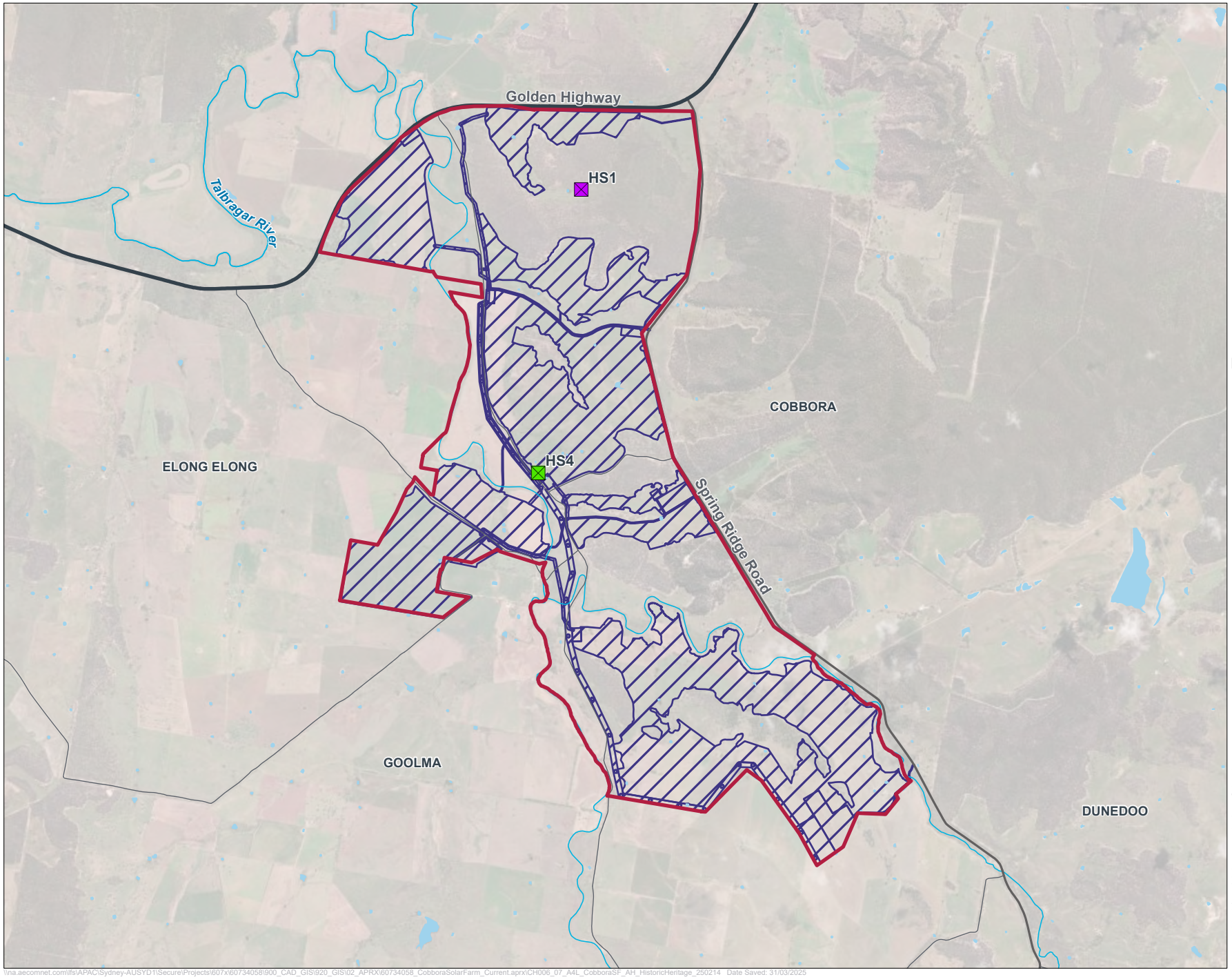
HS01 (Mechanical seeder) has been assessed as having no heritage significance and is not protected under the *Heritage Act 1977*. Nonetheless, HS01 is located outside of the Development Footprint and will not be accessed during construction.

The portion of HS04 (House and outbuildings) located within the Development Footprint will be demolished to enable construction of the Project. As noted in **Table 6-21**, HS04 has been assessed as having no heritage significance, and can be demolished without reference to the *Heritage Act 1977*. Accordingly, no impacts are proposed to historic heritage items during construction of the Project.

Operation

No further impacts to historic heritage items are likely during operation of the Project.

HS01 (Mechanical seeder) has been assessed as having no heritage significance and is not protected under the *Heritage Act 1977*. Nonetheless, HS01 is located outside of the Development Footprint and will not be accessed during operation.



AECOM

N

0 1 2 km

Legend

- Project Area
- Development Footprint
- Waterbody
- Watercourses
- Motorway
- Main road
- Local road

Historic heritage sites

- House
- Seeder

FIGURE 6-8: HISTORIC HERITAGE ITEMS

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6.4.5 Management and mitigation measures

Management and mitigation measures that will be implemented for the Project to address potential impacts to historic heritage are listed in **Table 6-22**.

Table 6-22 Management and mitigation measures – historic heritage

ID	Management and mitigation measure	Timing
HH1	A procedure will be included in the CEMP to guide the response to the discovery of any previously unknown items of heritage significance (being items of State heritage significance and/or local heritage significance) during construction. This will include guidelines on regulatory consultation, and physical management, include collection and salvage, as relevant.	Construction
HH2	The site induction will include obligations in relation to the relevant provisions of the *Heritage Act 1977* and the protection of items of heritage significance.	Construction

6.5 Geology, soil and land use

6.5.1 Secretary's Environmental Assessment Requirements

Table 6-23 sets out the SEARs relevant to land and where the requirements have been addressed in this EIS.

Table 6-23 SEARs – Land

Relevant SEARs	
Land	**Where addressed**
The EIS must address the following specific matters: • a detailed justification of the suitability of the site and that the site can accommodate the proposed development having regard to its potential environmental impacts, permissibility, strategic context and existing site constraints	• Site suitability is discussed in **Section 2.2.2** and **Section 7.1.2**.
• an assessment of the potential impacts of the development on existing land uses on the site and adjacent land, including: - consideration of agricultural land, flood prone land, Crown lands, mining, quarries, mineral or petroleum rights (if relevant); - a soil survey to determine the soil characteristics and consider the potential for erosion to occur; and - a cumulative impact assessment of nearby developments	• Potential impacts on existing land uses are discussed in **Section 6.5.4** • Flood prone land and other potential flood impacts are discussed in **Section 6.9** • Soil characteristics are discussed in **Section 6.5.3** and potential impacts to soil are discussed in **Section 6.5.4** • Potential cumulative impacts are discussed in **Section 16.15**.
• an assessment of the compatibility of the development with existing land uses, during construction, operation and after decommissioning, including: - consideration of the zoning provisions applying to the land, including subdivision (if required); - completion of a Land Use Conflict Risk Assessment (LUCRA) in accordance with the Department of Industry's Land Use Conflict Risk Assessment Guide; - assessment of the impact on agricultural resources and agricultural production on the Project Area and region in accordance with the Solar Guideline; and	• Zoning provisions are discussed in **Section 6.5.3** • A LUCRA has been prepared for the Project and is attached in **Appendix P (Soils, Land and Agriculture Impact Assessment)**. The results are discussed in **Section 6.5.4** • The assessment has been conducted in accordance with

Relevant SEARs	
- details of how the proposed development will implement and achieve agrisolar activities on the Project Area.	the Solar Guidelines, as discussed in **Section 6.5.2** • Agrisolar activities are discussed in **Section 3.4.4**.

6.5.2 Methodology

A soils, land and agricultural impact assessment was prepared by Minesoils to assess the potential impacts associated with the construction and operation of the Project and is attached as **Appendix P (Soils, Land and Agriculture Impact Assessment)**.

The assessment was undertaken in accordance with the Large-Scale Solar Energy Guidelines (Solar Guideline), which includes requirements to undertake a soil survey and verify land and soil capability (LSC) in accordance with the Land and Soil Capability Assessment Scheme (LSC Scheme). The site verification results concluded that a Level 3 – Detailed Agriculture Impact Assessment was required in accordance with the Solar Guideline. The requirements for this level of assessment are summarised below:

- Identify the soil characteristics of the Development Footprint from desktop searches and a site survey
- Assess the agricultural status and productivity of the Development Footprint in accordance with the LSC scheme
- Complete a LUCRA in accordance with the Department of Primary Industries (DPI) Land Use Conflict Risk Assessment Guide (DPI, 2011) to assess the potential for land use conflict to occur between neighbouring land uses
- Identify and describe the nature, duration and consequence of any potential impacts on agricultural land subject to the Project Area and in the wider region
- Outline strategies which may be adopted to mitigate potential impacts on agricultural land and minimise land use conflict (e.g. Agrisolar activities).

Minesoils conducted a site inspection of the Development Footprint between 23 to 26 of September 2024, which involved a soil and land resource survey.

6.5.3 Existing environment

Zoning and land use

The Development Footprint is zoned RU1 Primary Production under both the Warrumbungle LEP and the Dubbo Regional LEP, as shown on **Figure 6-9** (refer to **Chapter 4.0 Statutory context** for further detail). The Development Footprint and its surroundings are primarily used for farming, with rural residences located within the surrounding vegetation.

The online MinView database and mapping system (DPE, 2024) shows that there are no current mining or exploration licences over the Project Area. A number of historical exploration licences have existed, with the most recent for coal mining which ceased in June 2020.

It is understood that surrounding mineral extraction points have been decommissioned as no current construction or mining operations are in progress in the Development Footprint and surroundings.

There are Crown land parcels, roads and waterways within the Project Area. All Crown roads inside the Project Area are unformed and most are subject to an enclosure permit. Parts of Sandy Creek and Laheys Creek within the Project Area are also designated as Crown waterways. The southern access point (from Spring Ridge Road) will require the use of a Crown road to reach the Project Area. The landowner of the southern portion of the Project Area has commenced the application process to permanently close some of the unformed Crown roads and purchase the subject land from the Crown. In addition to the roads to be closed, the Proponent will apply for a licence to construct permanent access tracks across both Sandy Creek and Laheys Creek (refer to **Chapter 4.0 Statutory context** for further detail).

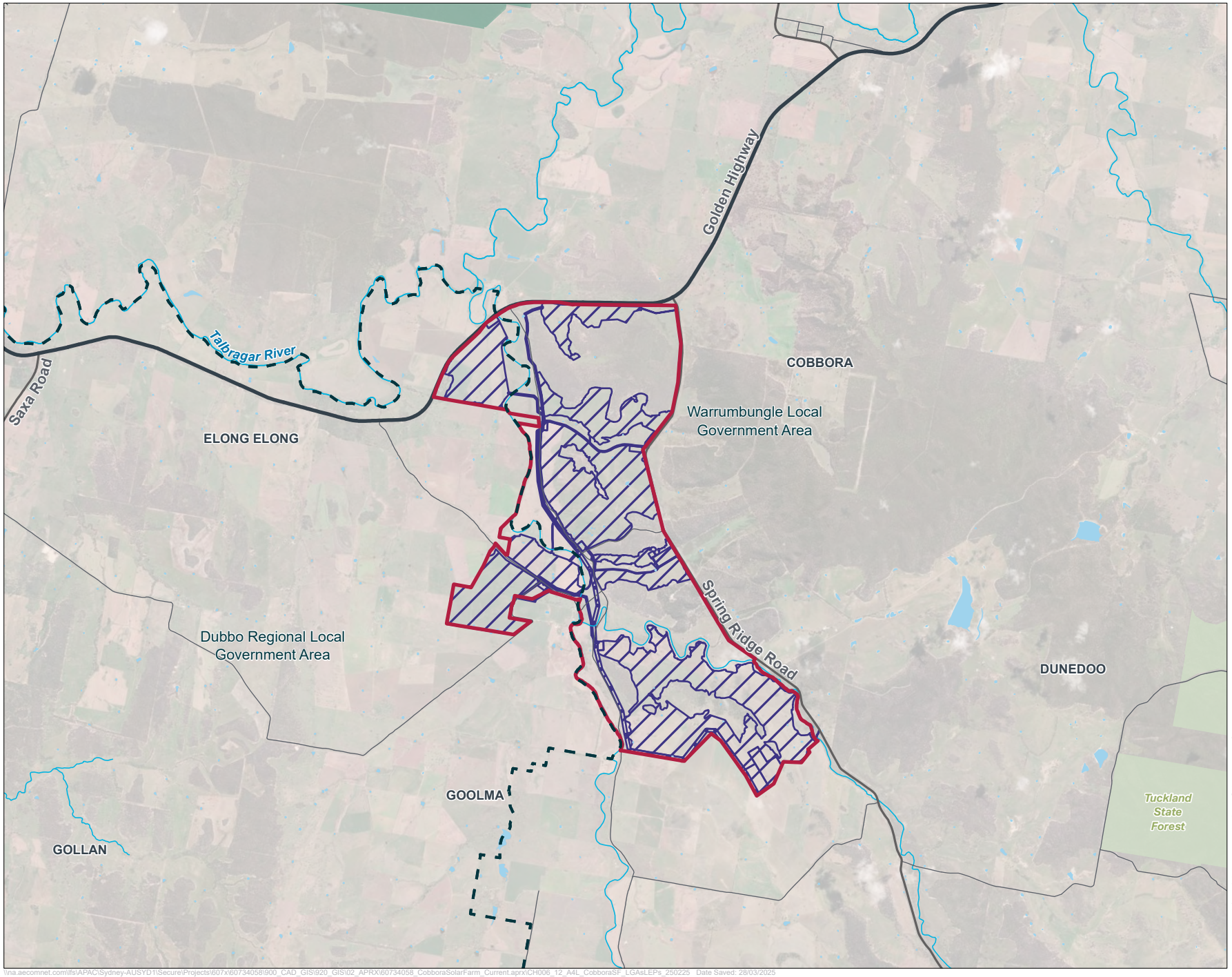

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FIGURE 6-9: DUBBO REGIONAL AND WARRUMBUNGLE LEPS

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Landscape

The Development Footprint was identified as a generally stable, free draining landform that has been disturbed by past agricultural clearing. It mainly features modified and native open pasture with 90-100% groundcover, and to a more limited extent, some areas of fodder cropping with varying groundcover. The Development Footprint is bordered by large sections of remnant native vegetation.

Landforms include undulating hills, slopes, ridges in the east and southwest, and alluvial plains and benches in the central and northwest areas. Shallow soils and rocky outcrops are found at higher elevations in the east. Ephemeral watercourses within or adjacent to the Development Footprint include Sandy Creek and Laheys Creek, which join the Talbragar River approximately 1 km to the north of the Development Footprint.

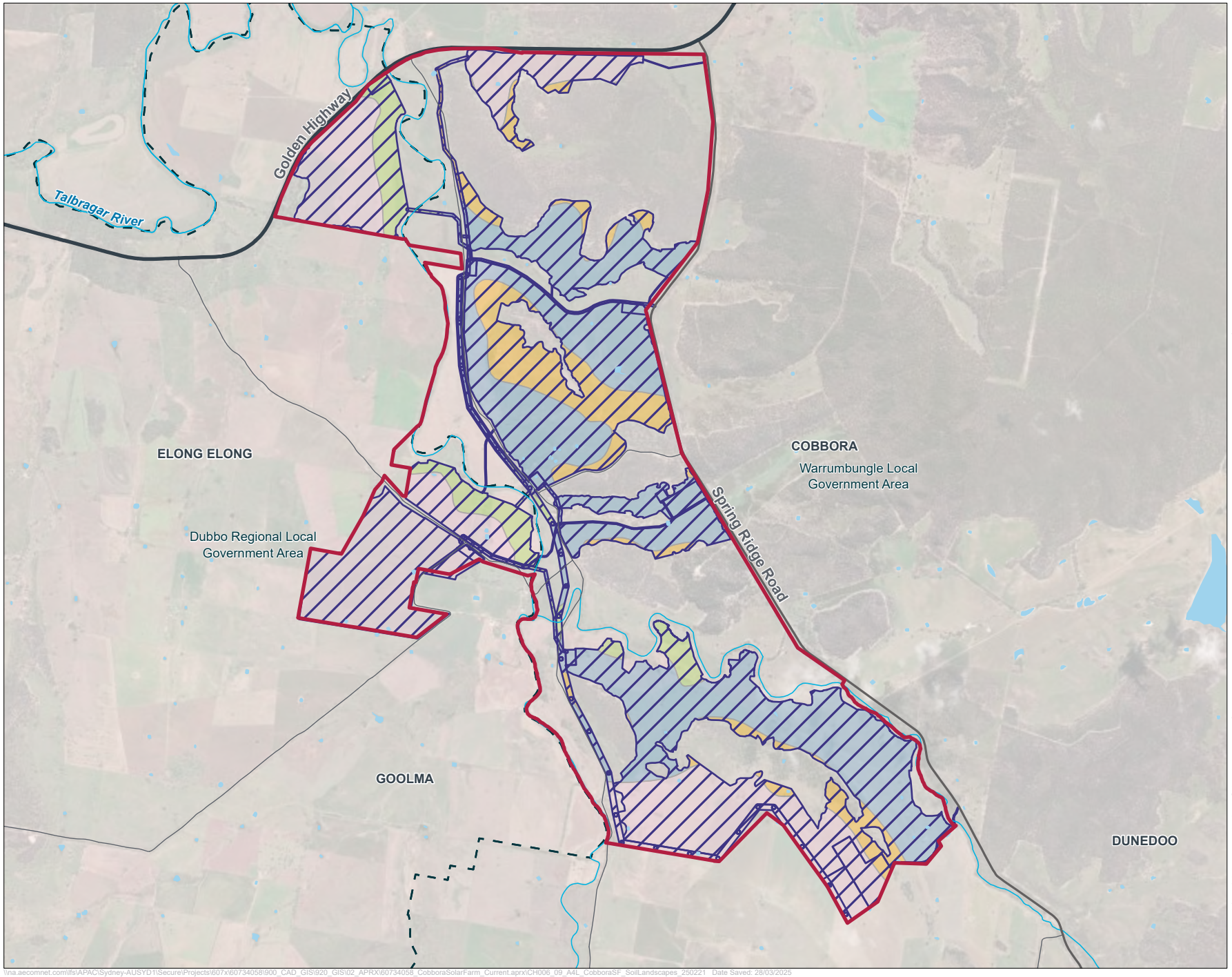
Minor landform modifications, including subtle contouring, are present in the higher elevation areas of the eastern portion of the Development Footprint.

Soil landscapes

The soil landscapes within the Development Footprint are shown in **Figure 6-10** and their features and limitations are summarised in **Table 6-24** as per Australian Soil Classification (ASC).

Table 6-24 Soil landscapes found within the Development Footprint features and limitations

Soil landscape	Features	Limitations
Ballimore	Undulating low hills with elevations from 280 – 400 m. Slopes are gently inclined (3 - 6%) with slopes 2000 – 3000 m long. Local relief varies between 20 – 40 m. Drainage lines are spaced at 500 – 1500 m intervals.	High erosion hazard under cultivation; surface soils structurally degraded and low in organic matter; low fertility; sodic subsoils on lower slopes; and several localised occurrences of salinity.
Dapper Hill	Undulating to rolling low hills with elevations between 360 – 570 m. Slopes are gently to moderately inclined (4 - 15%) with slopes 500 – 1000 m long. Local relief varies between 20 and 80 m. Drainage lines are 500 – 1500 m apart. Sandstone, shale.	Low fertility; commonly acidic surface soils; rock outcrop common; salinity is common on lower slopes and drainage lines; very high erosion hazard under cultivation.
Laheys Creek	Undulating low hills with elevations between 400 – 520 m. Slopes are gently inclined (3 - 10%) with slopes 500 – 1500 m long. Local relief varies between 40 – 50 m. Drainage lines are spaced 400 – 1200 m apart. Mainly lower slopes and valley floors. Sandstone, shales.	Very low to low fertility; seasonal waterlogging and sodic subsoils on lower slopes; moderate surface soil acidity; high to very high erosion hazard under cultivation.
Mitchell Creek	Alluvial plains and terraces of minor streams, levees and basins ranging from 280 – 540 m above sea level with level to slightly undulating (<4%) slopes ranging from 50 – 500 m long and up to 20 m relief. Streams are often entrenched, forming steep stream banks. Various alluvial deposits of sands, loams and Prairie Soils.	Moderate fertility; moderate to high available water holding capacity; weakly structured surface soils; streambank erosion; flood hazard.



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km
0 0.5 1

Legend

- Project Area
- Waterbody
- Local government area
- Watercourses
- Motorway
- Main road

Soil landscapes

- SI5504bm: Ballimore
- SI5504dh: Dapper Hill
- SI5504lc: Lahey's Creek
- SI5504mi: Mitchell Creek

FIGURE 6-10: SOIL LANDSCAPES WITHIN THE DEVELOPMENT FOOTPRINT

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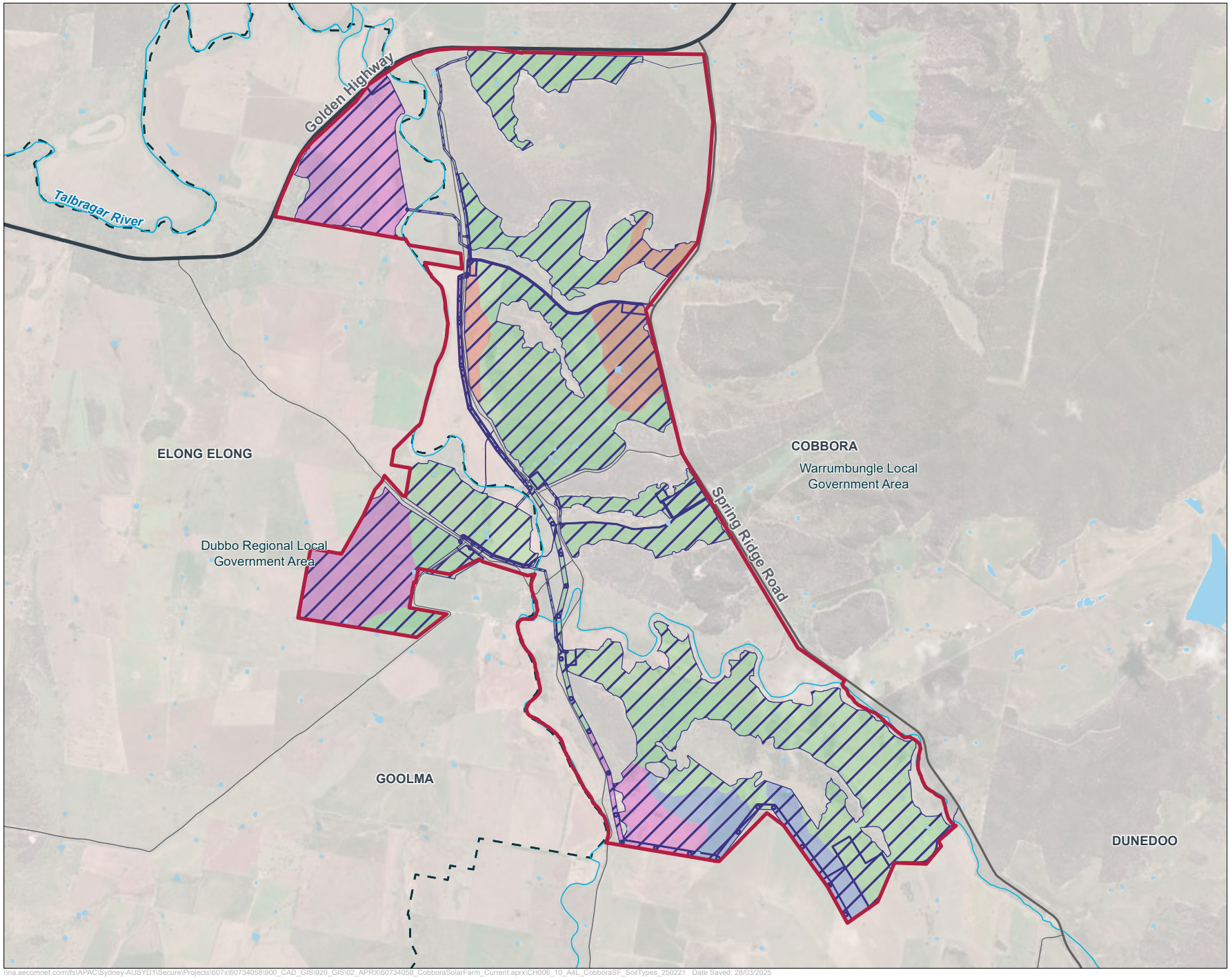
Soil types

The NSW regional soil mapping (OEH, 2024) indicates the dominant soil types within the Development Footprint are Chromosols, Sodosols, and Kurosols. During the soil survey, Dermosols were also found. Dominant soil mapping units identified during the soil survey are as summarised in **Table 6-25** and shown on **Figure 6-12.** Tested soils indicate there is moderate to high risk for dispersion of these soil types throughout the entire Development.

The Development Footprint does not contain any classes of acid sulfate soils on the NSW Acid Sulfate Soils Planning Map (NSW Government, 2024b). Land elevation and distance from the coast, in conjunction with existing acid sulfate soils mapping for NSW, means the potential for acid sulfate soils is considered a very low risk.

Table 6-25 Summary of soil types in the Development Footprint

Soil type	Features
Sodosols	This soil type covers 1,073 ha (~67 %) of the Development Footprint and is generally characterised by loam, silty loam and sandy loam topsoil with weak to moderate structure overlying light clay to heavy clay subsoils with structure that ranges from weak to strong. pH ranges from mildly neutral to moderately acidic in the topsoils, and strongly alkaline to moderately acidic in subsoil. These soils are generally non-saline. Soil profile drainage ranges from imperfect to moderate and subsoil mottling occurs sporadically. This soil is not strongly acidic and has a range in fertility from moderately low to moderate, with high fertility observed in deep, darker coloured soil profiles along drainage depressions and lower flats.
Chromosols	This soil type covers 320 ha (~20 %) of the Development Footprint and is characterised by loam and sandy loam topsoils with weak to moderate structure overlying light to heavy clay subsoils with moderate to strong structure. pH ranges from slightly acidic to moderately acidic in topsoils, and from mildly alkaline to moderately acidic in subsoils. These soils are consistently non-saline and generally non-sodic (with some exceptions). Soil profiles are moderately well drained and deep. Mottling is not common. This soil unit generally has moderate to moderately high fertility. This soil unit occurs on land which is currently or has previously been used for cropping activity.
Kurosols	This soil type covers 124 ha (~8 %) of the Development Footprint and is characterised by sandy loams and loamy sands with weak to moderate pedality overlying sandy loams, sandy clay loams and clay loams with weak or massive structure. These soils range from moderately acidic to strongly acidic in the topsoil, and from mildly alkaline to slightly acidic in subsoils. These soils are consistently non-saline and range from non-sodic to strongly sodic. This soil unit generally has moderate to moderately low fertility.
Dermosols	This soil type covers 91 ha (~5 %) of the Development Footprint and is characterised by loamy sand, loam and clay loam topsoils with moderate structure overlying light to heavy clay subsoils with moderate to strong structure. pH ranges from neutral to slightly acidic in topsoils, and from mildly alkaline to strongly alkaline in subsoils. These soils are consistently non-saline and range from non-sodic to sodic. Soil profiles are moderately well drained and deep. This soil unit generally has moderate to moderately high fertility.



AECOM

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0 0.5 1 km

Legend

- Project Area
- Development Footprint
- Waterbody
- Local government area
- Watercourses
- Motorway
- Main road

Soil Mapping Units

- Soil Mapping Unit 1: Sodosols
- Soil Mapping Unit 2: Chromosols
- Soil Mapping Unit 3: Kandosols
- Soil Mapping Unit 4: Dermosols

FIGURE 6-11: VERIFIED SOIL TYPES WITHIN THE DEVELOPMENT FOOTPRINT

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Land and soil capability

Land and soil capability (LSC) evaluates the inherent physical capacity of the land to sustain a range of land uses (and management practices) in the long term without leading to degradation of soil, land, air, and water resources. LSC was determined via a soil survey in accordance with the Land and Soil Capability Assessment Scheme (LSC scheme) which considers the biophysical features of the land and soil, and their associated hazards and limitations.

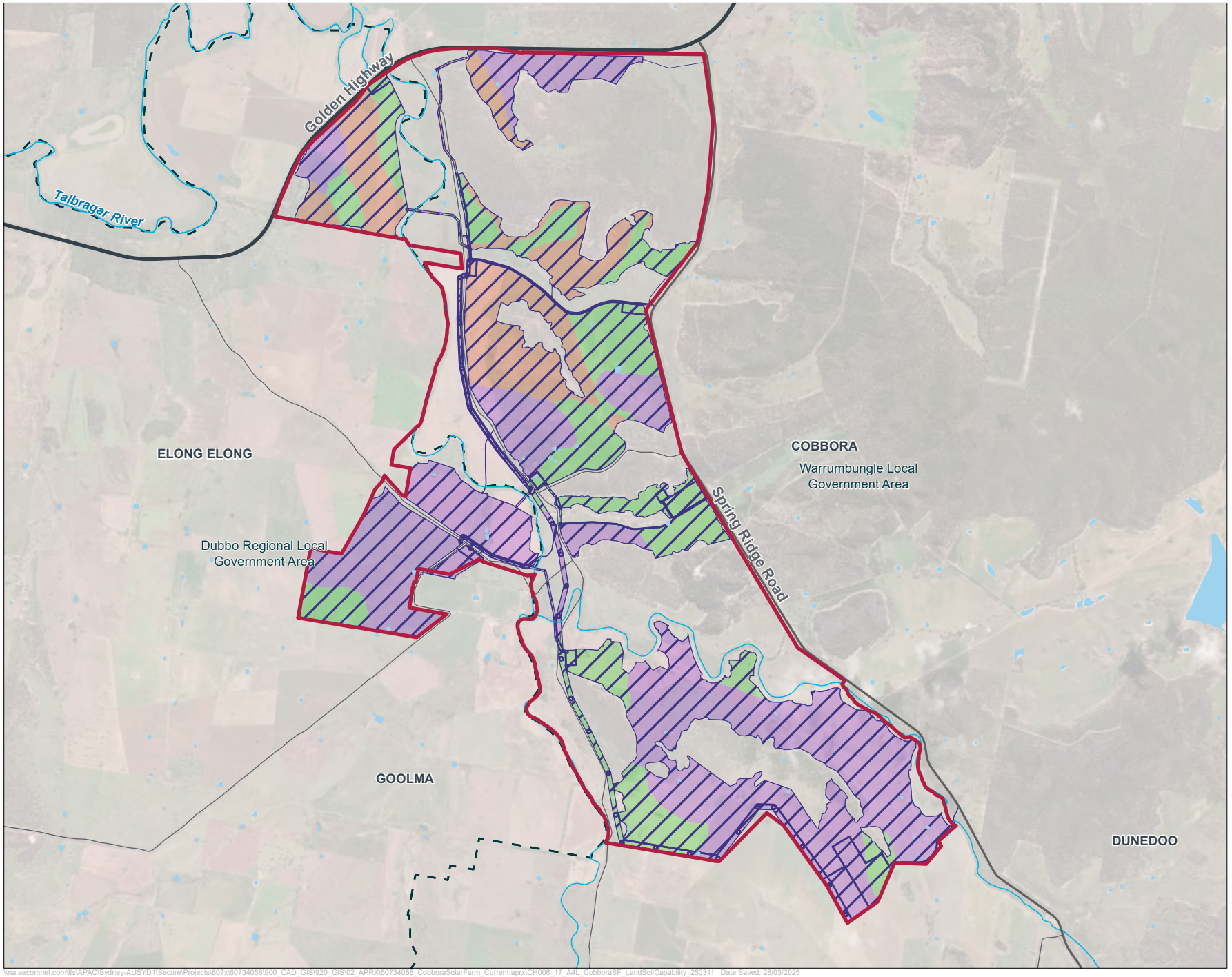
The verified LSC classes identified during the soil survey shown on **Figure 6-12** indicate the Development Footprint consists of:

- LSC class 3: high capability land (873 ha)
- LSC class 4: moderate capability land (437 ha)
- LSC class 5: moderate low capability land (298 ha).

Prominent hazards associated with the above classes within the Development Footprint include:

- Water erosion
- Soil structure decline
- Soil acidity
- Wind erosion
- Water logging.

Active erosion and sedimentation presence (sheet and gully erosion) was observed in the Development Footprint during the site inspection. However, this erosion was generally limited in extent. The assessment concluded that the erosion present could be readily addressed if it worsened.



AECOM

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Legend

- Project Area
- Development Footprint
- Waterbody
- Local government area
- Watercourses
- Motorway
- Main road

Verified land and soil capability

- LSC Class 3
- LSC Class 4
- LSC Class 5

FIGURE 6-12: VERIFIED LAND AND SOIL CAPABILITY

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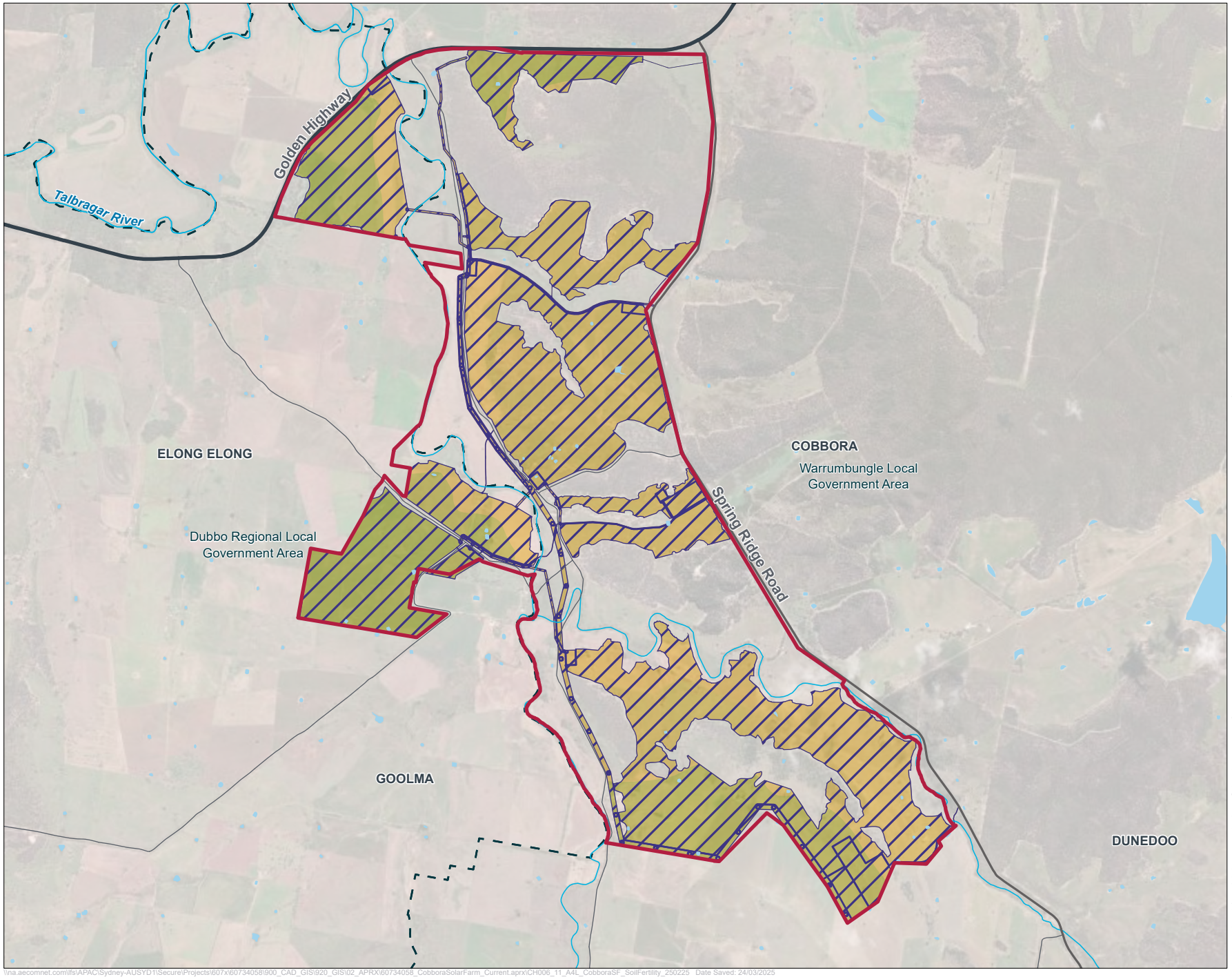
Soil fertility

Inherent soil fertility is used as a general indication of a soil's capacity to retain and release nutrients and soil water for use by vegetation. This is a function of the interrelationship between physical, chemical, and biological components in the soil.

NSW regional mapping (OEH, 2024) provides an estimation of the inherent fertility of soils across the state using the best available soils and natural resource mapping developed for the LSC dataset.

Review of this mapping indicates that the Development Footprint is dominated by soils with ‘Moderate’ and ‘Moderately Low’ fertility (refer to **Figure 6-13**). Soils with ‘Moderately Low’ or ‘Moderate’ fertility can generally only support plants suited to grazing; large inputs of fertiliser are required to make the soil suitable for arable purposes. Soils with ‘Moderate’ fertility usually require fertilisers and/or have some physical restrictions for arable use. The NSW regional mapping can be inconsistent with verified soil survey results.



AECOM

N

0 0.5 1 km

Legend

- Project Area
- Development Footprint
- Waterbody
- Motorway
- Main road
- Local road
- Watercourses
- Local government area

Soil fertility

- Moderately low
- Moderate

FIGURE 6-13: SOIL FERTILITY WITHIN THE DEVELOPMENT FOOTPRINT

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Agricultural land use

Within both Dubbo Regional and Warrumbungle LGAs livestock grazing is the dominant land use, followed by cropping. A summary of the agricultural land use across both LGAs is provided in **Table 6-26**, respectively. Further information on agricultural land use is detailed in **Appendix P (Soils, Land and Agriculture Impact Assessment)**.

Table 6-26 Dubbo Regional and Warrumbungle LGAs Agricultural land use 2020-2021 (ABS, 2022)

Agricultural land use	Dubbo Regional LGA		Warrumbungle LGA	
	ha	%	ha	%
Livestock grazing	422,458	75.6	472,231	80.5
Cropping	131,898	23.6	103,796	17.7
Forestry	2,575	0.5	10,158	1.7
Other	1,770	0.3	569	0.1
Total	**558,701**	**100**	**586,755**	**100**

The Development Footprint is subject to livestock grazing on modified pastures and fodder crops, supporting Merino sheep, lambs, and Hereford cattle. At the time of the site inspection, fodder crops in the southwest consisting of barley and oats. Satellite imagery, site observations, and discussions with landholders confirmed that the area has mainly been used for livestock grazing and fodder crops. Some broadacre cereal cropping was previously undertaken within the Development Footprint, however, none was observed at the time of the site inspection. Stock are watered via surface dams and some troughs for pumped water.

Neighbouring agricultural lands to the north, south, and west of the Project are also used for livestock grazing, with some isolated broadacre cropping (canola). Similar agricultural infrastructure, such as cattle yards, fences, and access tracks, is present across the locality. No intensive agricultural activities were identified in the area or its immediate surroundings.

Approximately 610 ha, or 38%, of the Development Footprint is preliminarily mapped as State Significant Agricultural Land (SSAL). SSAL refers to land that has been identified by the NSW Government as being of state or regional importance for agricultural production through draft mapping. This classification is based not only on biophysical factors but also on the economic and strategic importance of the land for food and fibre production, including its contribution to the state's agricultural industry.

There is no land mapped as Biophysical Strategic Agricultural Land (BSAL) within the Development Footprint. BSAL is land that is identified based on its biophysical characteristics, which are deemed critical for high-value agricultural production. This classification focuses on land that has the highest potential for long-term agricultural productivity due to factors like soil quality, water availability, climate, and topography.

Agricultural productivity

Agricultural productivity is subject to long term climate and rainfall variables, as well as changes in economic, social and policy frameworks, often at a scale well beyond the Development Footprint.

There is no standard metric to calculate agricultural productivity value and therefore potential productivity must be estimated. An estimate that accounts for land and soil capability and current land use has been made by analysing the information presented from the last agricultural census of 2020 – 2021 to produce an annual gross commodity value per ha per year. **Table 6-27** provides a summary of potential productivity across the Dubbo Regional and Warrumbungle LGAs. This information is a summary of land used for livestock grazing and cropping activities including the value of livestock slaughter, livestock products, and crops produced. Based on the LGA data, the agricultural productivity of the Development Footprint is estimated to be between approximately $466,480 and $516,329 per year, if the productivity rates for the respective LGA were multiplied across the full Development Footprint (i.e. not just the part of the Development Footprint within each LGA).

Table 6-27 Estimated potential productivity based on LGA data (ABS, 2022)

LGA	Estimated gross value in LGA ($/ha/year)	Development Footprint (ha) (approx.)	Estimated productivity ($/year)
Dubbo Regional	290.1	1,600	466,480
Warrumbungle	321.1	1,600	516,329

6.5.4 Impact assessment

Construction

Erosion

The erosion potential of soils in the Development Footprint is moderate to high due to the presence of dispersive soils. There is a potential risk for dispersion and erosion where soils and vegetation are disturbed through construction activities. The risk of erosion is increased where more substantial earthworks are required, such as for the construction of the BESS and substation pads, and site facilities.

Erosion may lead to water logging of soils, soil structure decline, and modified landforms (e.g. diversion of waterways, formation of gullies). Potential impacts on surface water quality associated with erosion are discussed in **Section 6.10**.

Detailed controls are outlined in the Erosion and Sediment Control Plan (ESCP) in Section 5.0 of **Appendix O (Flood Impact Assessment)** (refer to Section **6.10.5**). Based on the implementation of the proposed mitigation and management measures, the risk of erosion and sedimentation impacts on soils as a result of the Project are considered to be low.

Agricultural land use

A consideration of the agricultural land use of the Development Footprint was undertaken by Minesoils. This assessment assumed that agriculture will cease within the Development Footprint for the estimated 47 month construction and commissioning phase. The assessment also assumed that the current agricultural land uses immediate adjacent to the Development Footprint, and in the broader region, will not change as a result of the construction of the Project, and as such there will be no fragmentation or displacement of existing agricultural industries.

This temporary reduction of land used for agriculture during construction is considered a negligible impact in the context of the agricultural land use in the Dubbo Regional LGA and Warrumbungle LGA, representing 0.3% for each. For this reason, agricultural land use immediately adjacent to the Development Footprint, and in the broader Project region, will not change as a result of the construction of the Project, and there will be no fragmentation or displacement of existing agricultural industries.

Agricultural productivity

As outlined above, the assessment assumed that the entire Development Footprint will cease to be used for agriculture, resulting in an estimated reduction of primary productivity of up to $516,329 per annum. This lost agricultural productivity per year is considered a negligible impact in the context of the agricultural industry gross value of the Dubbo Regional LGA and Warrumbungle LGA, representing around 0.3% for each.

Agricultural resources

The agricultural assessment also considered impacts upon agricultural resources, including soils (including dispersion, erosion and sedimentation), LSC, water, and agricultural infrastructure. A summary of these potential impacts during the construction phase of the Project are summarised in **Table 6-28**.

Table 6-28 Potential impacts to agricultural recourses during construction

Agricultural resource	Description of potential impact	Severity
Soil disturbance	Soils within the Development Footprint will be subject to impacts as part of the construction of solar panels, site infrastructure and access tracks. In areas where earthworks, grading and excavations are necessary for construction, such as the BESS or site facilities, soils will be subject to higher impact disturbance.	Impacts to the soils of the Development Footprint are expected to be minimal and temporary. There will be no direct or indirect impacts to the soil resources of the Project locality outside the Development Footprint.
LSC	Construction of the Project will require the disturbance of soils within the Development Footprint. However, the Project will require only localised and sporadic landform modification including minor soil stripping (for excavation works and leveling), and that there will be no impacts to soil resources outside the Development Footprint.	No permanent impacts on LSC classes are anticipated within the Development Footprint as a result of the Project, if good soil management and mitigation measures are implemented.
Water	The construction groundwater requirements of the Project will comprise only a small fraction of the share components allocated for commercial extraction in the local groundwater sources.	Impacts to local groundwater extent and surface water quality during construction are likely to be low. Water impacts are discussed further in **Section 6.10**.
Erosion and sedimentation	There is a moderate to high potential risk for dispersion where soils are disturbed by Project construction efforts within the Development Footprint. Higher impact activities such as earthworks for substation pads or site facilities are likely to result in increased dispersive behaviour when soil is remoulded, compacted or pulverised.	Impacts are expected to be low and direct and indirect erosion and sedimentation risks will be limited and manageable.
Agricultural infrastructure	The Project will have a negligible impact on local and regional agricultural infrastructure. There will be negligible impacts on the road and rail network that connects the agricultural industry to markets, services and suppliers.	Negligible.

Other potential impacts on agriculture

Weeds and pests could be accidentally introduced into the Development Footprint with imported materials, machinery, or naturally through opportunities created by the removal or damage of remnant vegetation. However, with the application of industry-standard mitigation measures, the impacts of weeds and pest species on agriculture as a result of the Project are anticipated to be minor (refer to **Section 6.2** for further detail on biodiversity impacts).

Construction activities have the potential to increase dust through movement of traffic on unsealed roads on dry days, vegetation removal, and localised dust emissions generated by land disturbance (such as excavation activities required for infrastructure). Dust and poor air quality could lower agricultural productivity by damaging crops. It is expected that the construction activities will have a negligible impact on local air quality due to dust control measures that will be fully detailed in the Construction Environment Management Plan (CEMP). Air quality impacts are discussed further in **Section 6.14.2**.

The roads in proximity to the Development Footprint are anticipated to experience an increase in traffic volumes during the peak construction period. However, **Appendix H (Traffic and Transport Impact Assessment)** undertaken for the Project determined that the road network is able to accommodate the traffic generated by the development during the construction phase. Additionally, no increases in levels

of noise and dust that may affect agriculture are anticipated. Therefore, the traffic impacts of the Project are not likely to have consequences on agricultural enterprises within the Project locality.

Crown Land

There are some small parcels of Crown land and Crown roads within the Development Footprint. The Proponent will apply for a licence to construct permanent access tracks across both Sandy Creek and Laheys Creek. Permanent closure of the unformed Crown roads within the Development Footprint is expected to occur prior to construction Due to the size of the remaining Crown lands impacted, impacts are expected to be negligible during construction.

Operation

Land Use Conflict Risk Assessment

The LUCRA reviews the Project alongside adjacent and surrounding land uses and activities, with view to considering any incompatibility or conflict that may arise. This analysis draws upon the potential impacts of the Project that may extend beyond its boundaries (refer to Appendix 1 LUCRA of **Appendix P (Soils, Land and Agriculture Impact Assessment)** for further detail). The main land use conflict risk item categories identified during the operation phase of the Project included ground disturbances, noise, dust, traffic, biosecurity, water supply, workforce, and temporary workers accommodation.

These risks were considered in the context of the proposed mitigation measures and controls outlined in this EIS. These measures substantially reduce the level of risk (below a moderate risk) for the majority of the risks, with most complaints or conflict considered appropriately managed. However, two risks were identified as retaining a moderate risk for land use conflict during operation:

- Stakeholders in the locality may be concerned about the change in visual amenity resulting from the Project (refer to **Section 6.6** for further detail on visual impacts).
- Land users in the locality may be concerned about the risk of fires occurring at the site and their potential to spread to surrounding land, infrastructure, crops or livestock (refer to **Section 6.12** for further detail on bushfire impacts).

Agricultural land use

The Development Footprint consists of about 1,600 ha of land that is currently subject to agriculture land use. It is proposed to use as much of the solar array area as possible for agricultural purposes during the operational phase of the Project to reduce potential land use conflict and impacts to agricultural land and resources. Noting that areas such as the BESS, switchyard, substation, site facilities (control building) and internal roads will not be suitable for agricultural use, an area of approximately 1,200 ha will be subject to ongoing agricultural activities during operation.

An Agrisolar Grazing Strategy has been prepared for the Project. Agrisolar describes the use of land simultaneously for agriculture and solar farms. The Agrisolar Grazing Strategy is attached to **Appendix P (Soils, Land and Agriculture Impact Assessment)** as Appendix 4 Agrisolar Grazing Strategy.

Current agricultural land use immediately adjacent to the Development Footprint, and in the broader Project region, will not change as a result of the operation of the Project, and there will be no fragmentation or displacement of existing agricultural industries.

The Project will have a negligible impact on local and regional agricultural infrastructure. There will be negligible impacts on the road and rail network that connects the agricultural industry to markets, services and suppliers.

Impacts on Crown Lands during operation are expected to be negligible, with licences in place for any ongoing uses on remaining Crown Land and/or roads.

Agricultural productivity

The impact of the Project on productivity of agricultural land during operation is estimated to be $291,732 per year based on the following conservative assumptions:

- Removal of agricultural land use over 408 ha of the Development Footprint

- An estimated overall stocking reduction of 30% for the areas within the Development Footprint subject to agrisolar
- Sheep grazing enterprise only.

This is considered a negligible impact in the context of the gross value of the agricultural industry in the Dubbo Regional LGA and Warrumbungle LGA, representing 0.1% of each.

Agricultural resources

The agricultural assessment also considered impacts upon agricultural resources, including soils (including dispersion, erosion and sedimentation), LSC, water, and agricultural infrastructure. A summary of these potential impacts during the operational phase of the Project are summarised in **Table 6-29**.

Table 6-29 Potential impacts to agricultural recourses during operation

Agricultural resource	Description of impact	Severity
Soil disturbance	Soil that is proposed to be disturbed during the Project will be stripped and re-used on site as possible in order to mitigate long term effects on soil resources during operation of the Project. Land surrounding the solar panels will be stabilised and vegetated to promote retention and infiltration in a manner similar to, or better than, existing conditions. Soil disturbance during operation of the Project is anticipated to be minimal and limited to maintenance activities, involving very localised activities on an infrequent basis.	Impacts to the soils of the Development Footprint are expected to be minimal and temporary. There will be no direct or indirect impacts to the soil resources of the Project locality outside the Development Footprint during operation.
LSC	Due to the minimal disturbance to the landform post construction, it is considered that there will be no reduction in LSC.	No permanent impacts on LSC classes are anticipated within the Development Footprint as a result of the Project.
Water	The annual operational requirement accounts for less than 0.001% of the share components currently allocated for commercial extraction within the Gunnedah-Oxley Basin Groundwater Source, impact to local groundwater extent during operation will be minimal.	No impacts are anticipated on the quality and availability of current surface or groundwater resources used by local landholders.
Erosion and sedimentation	Erosion and scouring may occur in the event of poor site stabilisation and/or re-establishment of ground cover, leading to sediment mobilisation. As noted above, land surrounding the solar panels will be stabilised and vegetated to promote retention and infiltration. The solar panels will be mounted on a tracking system that will change orientation during the day, with any rainfall runoff being distributed onto the ground in the area around each panel depending on its orientation at the time, and not drained permanently to a single point on the ground. Potential impacts occurring from maintenance work within solar panel area extents and from access track surfaces will be infrequent and minimal.	Direct and indirect erosion and sedimentation risks are anticipated to be limited and manageable. Impacts are expected to be low.

Agricultural resource	Description of impact	Severity
Agricultural infrastructure	No local or regional agricultural infrastructure impacts are anticipated.	Negligible.

Other potential impacts on agriculture

The presence of weed species has the potential to be a long term limitation to agricultural activities such as lowering productivity, as well as impacting rehabilitation efforts within the Development Footprint. However, with the application of industry-standard mitigation measures, the impacts of weeds and pest species on agriculture as a result of the Project are anticipated to be minor.

During operations, ongoing maintenance of infrastructure and land will result in very minor, localised vehicle emissions and generation of dust from vehicles travelling along unsealed internal access tracks. These impacts are unlikely to affect land use or agriculture.

The road network is able to accommodate the traffic generated by the development during the operation of the Project. No traffic-related increases in noise and dust are anticipated that will impact agriculture.

Decommissioning

Land used for agriculture

It is anticipated that agricultural land use will be re-established over the entire Development Footprint after decommissioning and rehabilitation (unless otherwise agreed with landowners and/or regulatory authorities). Therefore, there will be no permanent reduction in land available for agriculture use.

Following the end of life for the Project, the Development Footprint will be re-graded (where required), and any minor stockpiles of topsoil and subsoil will be respread over disturbed areas and rehabilitated with either native vegetation or improved pastures depending on the intended final land use. This strategy, along with good soil management practices will facilitate the rehabilitation in returning the land to an equivalent LSC class.

The Development Footprint will be rehabilitated to a condition as near as practicable to the condition that existed prior to the Project and returned to an approximately equivalent agricultural productivity following the Project.

Impacts on Crown Lands during decommissioning are expected to be negligible, with licences in place for any ongoing uses on remaining Crown Land and/or roads.

6.5.5 Management and mitigation measures

Management and mitigation measures to avoid, minimise or manage potential geology, soil and land use impacts of the Project are listed in **Table 6-30**. A full list of environmental management and mitigation measures for the Project can be found in **Appendix E (Compilation of Mitigation Measures)**.

Table 6-30 Management and mitigation measures – geology, soil and land use

ID	Management and mitigation measure	Timing
S1	A Soil and Water Management Plan (SWMP) will be developed and implemented as part of the CEMP to address temporary and site-specific risks to sediment and erosion risk during construction and describe soil and water management measures to be implemented. The SWMP will include erosion and sediment control measures to: • Be implemented and maintained in accordance with the principles and requirements in Managing Urban Stormwater - Soils and Construction (Landcom 2004) and Volume 2A (NSW Department of Environment, Climate Change and Water 2008), commonly referred to as the “Blue Book”. • Be prepared by a suitably qualified and experienced professional.	Construction

ID	Management and mitigation measure	Timing
	• Progressively stabilise and rehabilitate disturbed areas throughout construction.	
S2	Prepare and implement an Agrisolar Grazing Plan in consultation with the landowner, in line with the Agrisolar Grazing Strategy.	Construction, Operation and Decommissioning
S3	A Decommissioning Plan will be prepared at the end of the Project's operational life ensuring appropriate environmental management and site restoration. The Development Footprint will be rehabilitated to a condition as near as practicable to the condition that existed prior to the Project and in consultation with stakeholders and landowners.	Decommissioning
S4	If contaminated sites are uncovered during construction, the following measures will be undertaken: • Cessation of ground disturbance at the location and within the immediate vicinity. Assessment of the site contamination and determination of appropriate remedial action.	Construction
S5	When using water for dust suppression, the amount of water applied will not exceed what is required to effectively suppress dust. The application of water for dust suppression will: • Not cause on-site ponding or runoff • Be direct to the area being dust suppressed • Not harm vegetation surrounding the area that is being dust suppressed • Not cause visible salting.	Construction and Operation
S6	Spill kits appropriate to products used on site will be readily available and stored in all vehicles on site. As far as practicable, any spills of hazardous materials occurring on site will be rendered safe (unable to contaminate further) by construction staff as soon as possible after the event, and the site environmental representative informed immediately. The response to the spill, including any testing, treatment and/or disposal will be determined by Project environmental staff in accordance with relevant regulation and policy.	Construction and Operation

6.6 Landscape and visual impact

6.6.1 Secretary's Environmental Assessment Requirements

Table 6-31 sets out the SEARs relevant to landscape and visual and where the requirements have been addressed in this EIS.

Table 6-31 SEARs – Visual

Relevant SEARs	
Visual	**Where addressed**
The EIS must address the following specific matters: • a landscape and visual impact assessment (LVIA), prepared in accordance with the Solar Guideline and the Technical Supplement – Landscape and Visual Impact Assessment;	• A LVIA has been prepared and is attached as **Appendix F (Landscape and Visual Impact Assessment)**
• a detailed assessment of the likely visual impacts (including night lighting) of all components of the project (including transmission lines, substations and any other	• Potential visual impacts are discussed in **Section 6.6.4**

Relevant SEARs	
ancillary infrastructure) on surrounding residences (including approved developments, lodged development applications and dwelling entitlements), and key locations, scenic or significant vistas and road corridors in the public domain and on the Siding Spring Observatory in accordance with the Dark Sky Planning Guideline (2023); and	
• details of measures to mitigate and/or manage potential impacts (including a draft landscaping plan for on-site perimeter planting, with evidence it has been developed in consultation with affected landowners);	• Appropriate management and mitigation measures are discussed in **Section 6.6.5**
• provide a glint and glare assessment prepared in accordance with the Solar Guideline.	• A glint and glare assessment is provided as part of **Appendix F (Landscape and Visual Impact Assessment)**.

6.6.2 Methodology

A LVIA was prepared by Moir Studio to assess the potential landscape character and visual impacts associated with the construction and operation of the Project (see **Appendix F (Landscape and Visual Impact Assessment)**). The assessment methodology applied by Moir Studio was consistent with the Solar Guideline (DPHI, 2024d) and the Technical Supplement - Landscape and Visual Impact Assessment (version 1.1) (DPHI, 2024e).

The LVIA methodology for the Project included:

- A desktop study to identify the baseline environment of the Project Area, to determine the Project's level of visibility and its ability to be accommodated within the surrounding landscape
- A site visit in October 2024 to establish the existing landscape character
- A simple, intermediate and detailed visual impact assessment to assess the impact of the Project upon private and public viewpoints, incorporating the sensitivity and magnitude ratings outlined in **Table 6-32**, adapted from the Technical Supplement.
- Assessment of potential impacts of night lighting and glint and glare from the Project on nearby sensitive receptors
- Identifying management and mitigation measures to minimise the potential impacts to landscape and visual amenity.

Table 6-32 Landscape character and visual impact matrix

		Sensitivity			
		High	Moderate	Low	Very Low
Magnitude	Very High	High	High	Moderate	Moderate
	High	High	Moderate	Moderate	Low
	Moderate	Moderate	Moderate	Low	Low
	Low	Moderate	Low	Low	Very Low
	Very Low	Low	Low	Very Low	Very Low

Site visit

Moir Studio completed a site visit in October 2024 to establish a visual baseline and determine the landscape character of the Project Area (discussed further below). This included a photographic survey at relevant viewpoints.

Landscape character assessment

Study area

In accordance with the Technical Supplement, the Study Area for the landscape character assessment was defined by the Project Area plus a buffer of 5 km (**Figure 6-14**).

Landscape character zones

As part of the landscape character assessment, three landscape character zones (LCZs) were established. LCZ identify areas with distinct qualities and visual characteristics, such as vegetation, water bodies, key features, landforms, and land use.

A scenic quality rating was applied to each LCZ based on the Scenic Quality Frame of Reference and the visual reference for scenic quality values provided in the Technical Supplement.

Impact assessment

The impact of the Project on each LCZ was evaluated by assessing both the landscape's sensitivity and the magnitude of the Project's effects (refer to **Table 6-32**). This assessment has only been undertaken for the operational project as construction impacts will be temporary.

For the purposes of the landscape character impact assessment:

- **Sensitivity** reflects the area's ability to absorb changes from the Project, with scenic quality considered in the evaluation.
- **Magnitude** considers the size and scale of the Project, including the extent to which landscape elements may be lost, the contribution of the Project to the landscape character, the Project's visual dominance, and its impact on key characteristics critical to the landscape's distinctive identity. Magnitude also considers the geographical area of the landscape that will experience the Project's effects.

These factors were then combined to assess the overall impact of the Project on each landscape character zone.

Visual impact assessment

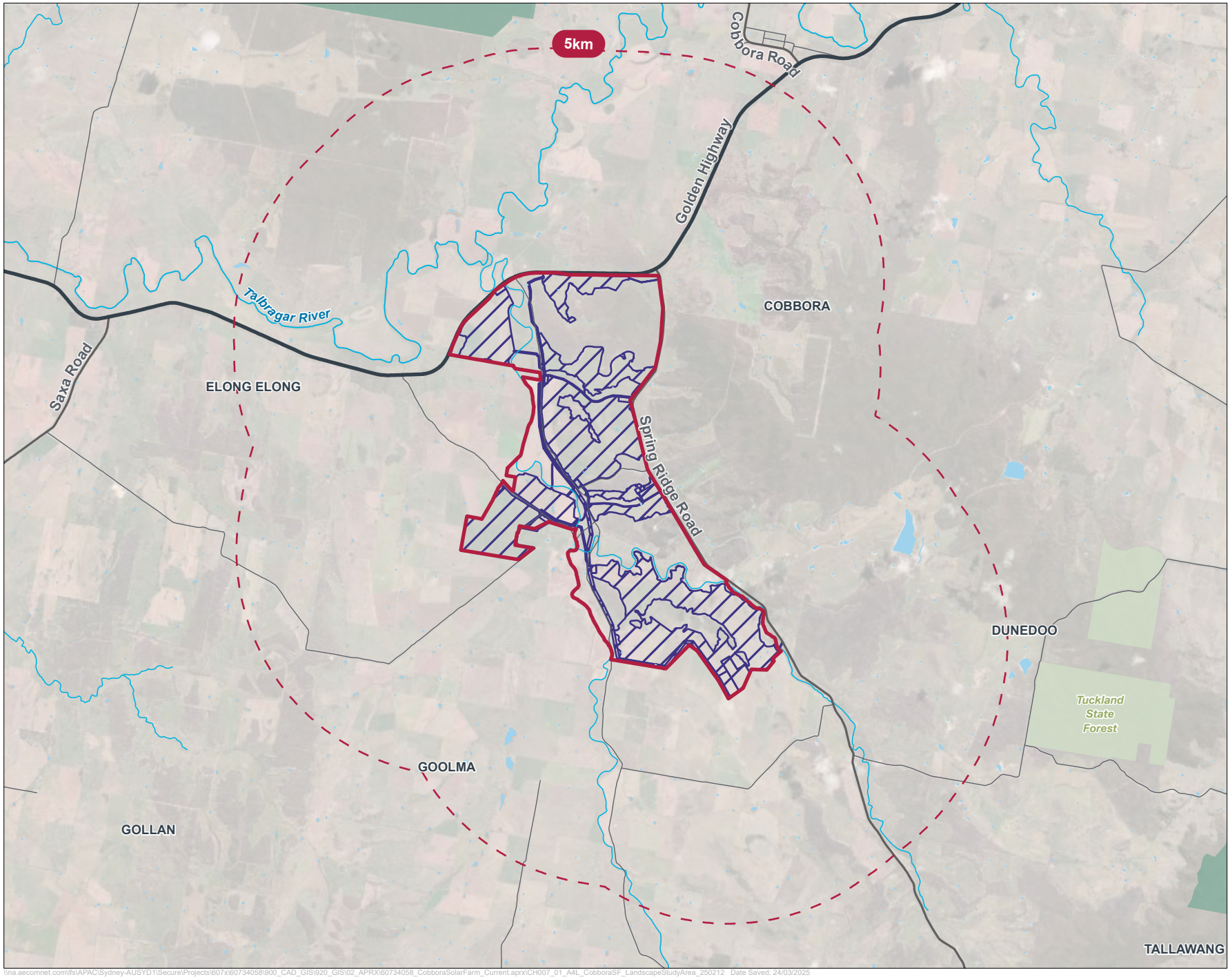
In accordance with the Solar Guidelines (DPHI, 2024d), the Project's impact on private viewpoints (with line of sight) within 4 km and those on public roads and rail lines (with line of sight) within 2.5 km were assessed. Viewpoints were assessed in four stages:

- Simple assessment – Used to identify viewpoints in the public and private domain. Eliminate viewpoints, using viewshed mapping, with no visibility of the Project or with very low visual impact
- Intermediate assessment – Identify viewpoints with moderate or high visual impacts based on desktop analysis
- Detailed assessment – Identify viewpoints with moderate or high visual impact based on data collected on site
- Evaluate performance objectives – Assess viewpoints with moderate or high visual impact against performance objectives and develop mitigation strategies.

For each viewpoint the visual impact assessment considered:

- the **visual magnitude**, which was quantified by the extent of the horizontal and vertical fields of view occupied by the Project.
- the **visual sensitivity**, which was determined by considering the quality of the existing view and the capacity to absorb the impacts from the proposed change (refer to **Appendix F (Landscape and Visual Impact Assessment)** for further detail).

Both magnitude and sensitivity were given ratings, from which an overall visual impact rating was derived (refer to **Table 6-32**).



AECOM

N

0 1 2 km

Legend

- Project Area
- Development Footprint
- Landscape Character Study Area
- State forest
- National parks and reserves
- Waterbody
- Watercourses
- Motorway
- Main road

FIGURE 6-14: LANDSCAPE CHARACTER ASSESSMENT STUDY AREA

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Night lighting

The Dark Sky Planning Guidelines (DPHI, 2023) aim to support the maintenance of a dark sky within 200 km of the Siding Spring Observatory. The Project is located within this zone, being approximately 90 km from the Observatory. The Project is however located outside the 18 km zone where either lighting measures or LEP requirements apply. Despite this, night lighting impacts have been considered in **Section 6.6.4**.

Glint and glare

Sunlight reflecting off the solar panels has the potential to result in glint and glare impacts. Glare occurs over a continuous period while glint is a brief flash of light.

Glint and glare was assessed according to the Solar Guidelines (DPHI, 2024d) and considered three viewpoint categories:

- **Residential:** private receptors identified within 3 km of the Development Footprint and with a line of site of the Project
- **Road and rail:** public road and rail receptors identified within 1 km of the Development Footprint
- **Aviation:** receptors identified within 5 km of the Development Footprint.

The assessment considered a scenario of ‘normal tracking’ during daylight hours, assuming that the solar modules will be following the sun during all daylight hours where the maximum tilt of 60° will be reached for sunrise and sunset. This is a worst-case scenario and does not account for factors such as weather conditions, intervening elements like vegetation, or built structures, which may influence the actual glare experienced.

Community consultation

Consultation has been undertaken with the community since June 2024, to identify and establish the importance of particular landscape values and characteristics. This included consultation with the Aboriginal community (see **Section 6.3**), the local councils, and potentially affected landowners with the purpose of establishing the following:

- Key significant landscape features
- Areas of scenic quality
- Key public viewpoints valued by the community.

Engagement started with providing a factsheet and personalised letter drop-off which detailed the project and sought permission to access people’s properties for comprehensive assessments in early October 2024. The majority of landowners responded positively, granting access. Other landowners, even those beyond 4 km from the Project, expressed a keen interest in understanding how the development may impact their views.

Between 10 and 12 October 2024 Moir Studio visited six landowners’ properties to capture photographs from various viewpoints. Several landowners expressed interest in evaluating the proposed solar farm's vistas from their most prominent locations.

6.6.3 Existing environment

Baseline environment

The Study Area is part of the Brigalow Belt South Biogeographic Regionalisation of Australia. More specifically, it is part of the Talbragar Valley Subregion, which is characterised by rocky hills, long undulating slopes and broad valleys.

The Study Area contains ephemeral and permanent waterways which lead into the Talbragar River, located approximately 1 km north of the Development Footprint. Sandy Creek is the main waterway that runs south-north through the Project Area, with several creeks, including Laheys Creek, feeding into it. Vegetation typically follows the waterways and, together with the vegetated ridgelines, are a key landscape character feature.

Vegetation mainly consists of pasture, forests and woodlands. The Study Area is generally comprised of agricultural areas characterised by cleared land utilised for grazing and dryland cropping, with pockets of remnant native vegetation covering hills to the east.

The Golden Highway is located along the northern boundary of the Project Area and is the main road connecting Dunedoo in the east to Dubbo in the west. Spring Ridge Road is a sealed road on the eastern boundary of the Project Area that connects the Golden Highway to the Castlereagh Highway and Gulgong to the south. Several local unsealed roads run through the Project Area.

Landscape character zones

Two LCZs were identified within the Study Area, as summarised in **Table 6-33** and shown on **Figure 6-15**.

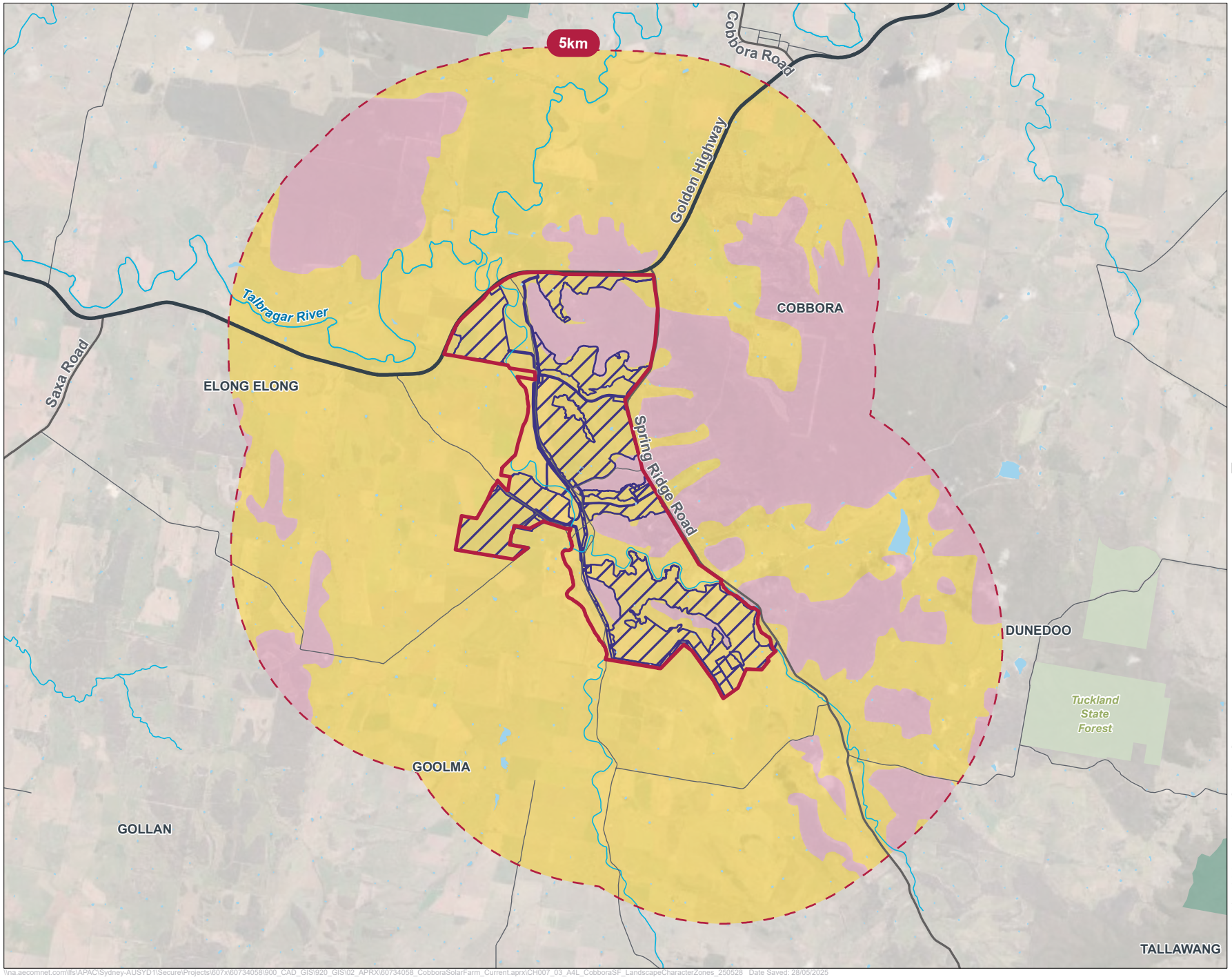
Viewpoint locations

A total of 31 non-associated private (dwelling) viewpoints with a line of sight of the Project were identified within 4 km. Thirteen representative viewpoints with a line of sight to the project from public locations such as roads were identified within 2.5 km. These locations are shown on **Figure 6-16**. There is no passenger rail in proximity to the Project.

Table 6-33 Summary of landscape character zones and sensitivity within the Study Area

LCZ	Description	Scenic quality[1]	Landscape
LCZ 1: Agricultural Pastures	The landform within the LCZ is typically defined by flat to gently undulating open agricultural land and low-density rural dwellings. The vegetation is generally cleared to allow agricultural land use, with patches of vegetation in small pockets. The primary activity in this area is farming, including grazing livestock and some crop cultivation. These activities shape the landscape, with grazing lots often delineated by fencing characterising the pastoral and modified land use within the LCZ.	Low	
LCZ 2: Vegetated Hills	The landscape within the LCZ is typically defined by undulating terrain with dense vegetation, including the narrow-leaved ironbark and white cypress pine woodland communities. Steeper areas and slopes with dense vegetation are subject to limited agricultural activity.	Low	

[1] Application of the Scenic Quality Rating Frame of Reference for each LCZ is provided in detail in **Appendix F (Landscape and Visual Impact Assessment)**



AECOM

N

0 1 2 km

Legend

- Project Area
- Development Footprint
- Landscape Character Study Area
- Waterbody
- State forest
- National parks and reserves
- Motorway
- Main road
- Local road
- Watercourses

Landscape Character Zones

- LCZ 1 Agricultural pastures
- LCZ 2 Vegetated hills

FIGURE 6-15: LAND-SCAPE CHARACTER ZONES

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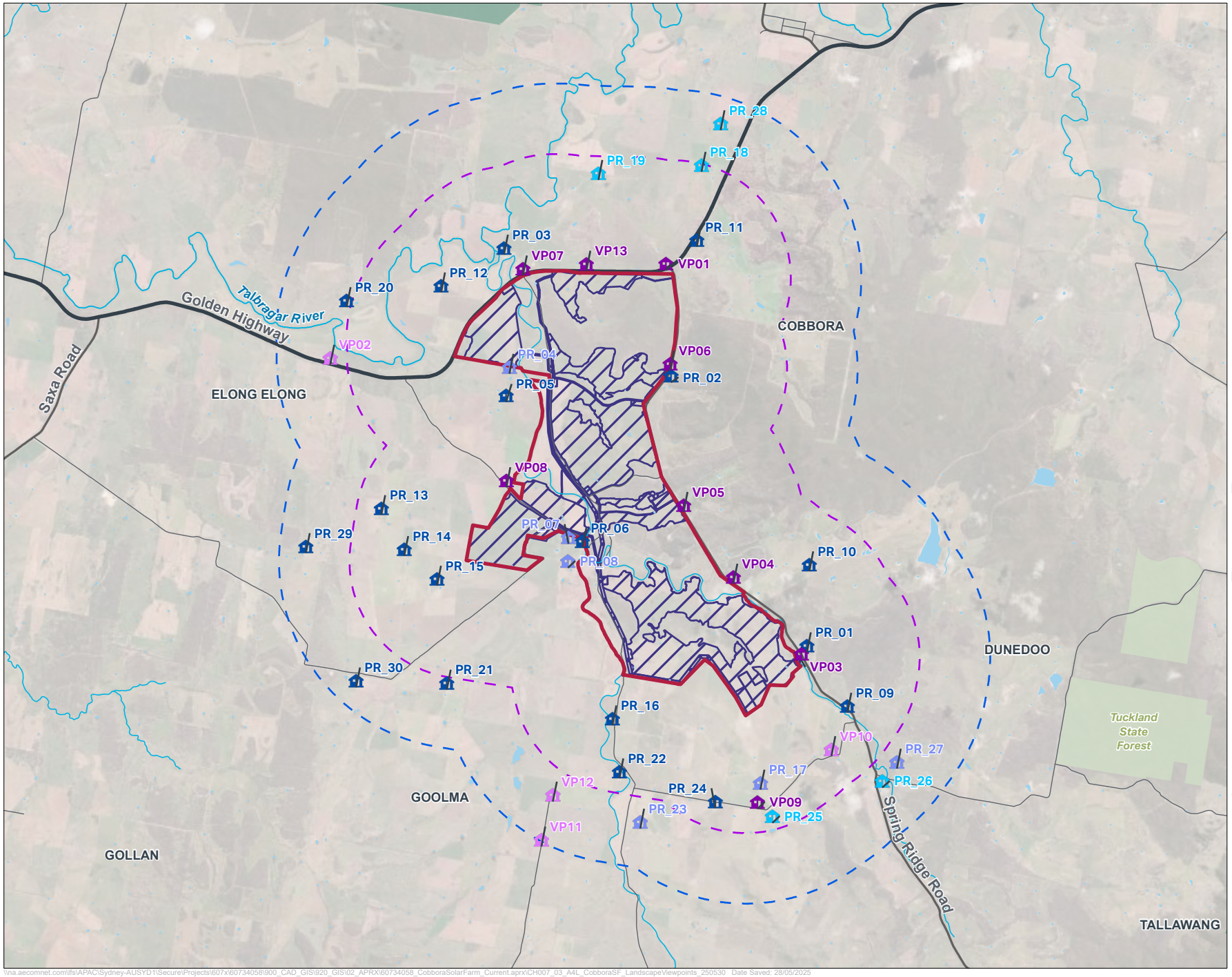

AECOM

N

0 1 2 km

Legend

- Project Area
- Development Footprint
- Private receptor study area
- Public receptor study area
- State forest
- National parks and reserves
- Waterbody
- Watercourses
- Motorway
- Main road
- Local road

Public viewpoints

- No assessment required
- Assessment required

Private viewpoints

- No assessment required
- No visibility
- Assessment required

FIGURE 6-16: PRIVATE AND PUBLIC VIEWPOINT LOCATIONS

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Source: Earthstar Geographics

6.6.4 Impact assessment

Construction

Construction activities are likely to result in potential temporary visual impacts. Receivers likely to be affected include (but are not limited to):

- Neighbouring landowners or those that have views of the Project and/or its construction compounds
- Road users.

The most visible activities associated with the construction phase of the Project will include:

- Temporary construction areas such as laydowns, compounds and helicopter landing site (emergencies only)
- Clearing of vegetation
- Access road construction
- Movements of light and heavy construction vehicles
- Installation of solar panels, the BESS and associated infrastructure
- Construction of operational and management facilities
- Temporary workforce accommodation and parking.

An indicative list of construction equipment and activities required for the project is provided in **Chapter 3 Project description**. In general, construction activities will be localised to the area within and immediately surrounding the Development Footprint.

The Project's main construction area and temporary workforce accommodation will be located in the central portion of the Project Area, adjacent to Spring Ridge Road. This area is sited away from nearby residences (just under 1 km from the nearest receptor) and will have a minimal visual impact due to intervening vegetation and topography. The presence of dense roadside vegetation along Spring Ridge Road will fragment views, limiting the potential visual impacts of these facilities on surrounding public receptors. Motorists travelling along the local road network may experience intermittent views of construction activity, including vehicles entering the access roads. However, it is assumed that the focus of motorists will be in line with their direction of travel along the road corridors, minimising their views into the Development Footprint.

As a result, the overall visual impact on public receptors will be low.

Operation

Landscape character assessment

Infrastructure associated with the Project has the potential to contrast with the existing visual landscape. A summary of potential operational impacts to each LCZ is provided in **Table 6-34**.

Table 6-34 Landscape character impact of landscape character zones

LCZ	Scenic quality rating	Sensitivity	Magnitude	Landscape character impact
LCZ 1: Agricultural Pastures	**Low**	**Low** The LCZ is a modified environment defined by land predominantly cleared to support pastoral activity such as livestock grazing, agriculture and cropping. As such, it is considered to have some capacity to	**Moderate** Views towards the Project would be available from locations at close range including along Spring Ridge Road, Danabar Road, Sweeneys Lane, Spring Ridge Road and the Golden Highway. Existing vegetation is likely to assist in filtering	**Low**

LCZ	Scenic quality rating	Sensitivity	Magnitude	Landscape character impact
		absorb the type of change predicted by the Project.	views of the Project from Spring Ridge Road and the Golden Highway. Multiple energy development projects are proposed within this LCZ. While the undulating topography and existing vegetation will aid in preventing extensive views of multiple projects, infrastructure elements are expected to be visible at close range. However the existing scenic quality of this LCZ is low, not being a rare or unique landscape. Additionally, any new infrastructure is expected to coexist with ongoing agricultural activities—particularly grazing—contributing to a multi-use, productive landscape.	
LCZ 2: Vegetated Hills	**Low**	**Moderate** This landscape is predominantly intact with minor evidence of human intervention e.g. presence of dwellings, road corridors or other infrastructure. Lack of conservation reserves or public open spaces within the LCZ limit the possibility of public access. The landscape elements that contribute to its quality will remain unchanged.	**Low** The Project will not be visually dominant in this LCZ as opportunities to view the Project from within the LCZ are limited due to isolated roads and screening vegetation. Due to the horizontal scale of the Project, the Project does not occupy vertical fields of view and therefore, the resulting landscape change is considered minimal. While this LCZ is located within the Project Area, the Project Footprint including the Solar Arrays and associated infrastructure is located outside this LCZ. As a result the resulting magnitude of change is considered to be low.	**Low**

The overall impact on landscape character has been assessed low for each respective LCZ as a result of the Project.

Visual impact assessment

The simple visual impact assessment identified 15 private viewpoints and eight public viewpoints requiring further assessment. The locations of these viewpoints are shown on **Figure 6-16**. These viewpoints were subject to an intermediate assessment to determine the magnitude of impact, followed

by a detailed assessment, if required. Further assessment is required when the impact remains moderate or higher (detailed assessment) which will require a detailed photomontage to provide a realistic representation of the Project.

Potential visual impacts on both private and public viewpoints are summarised in **Table 6-35**.

Table 6-35 Simple, intermediate, and detailed visual impact assessment (private and public)

Stage of assessment	Impact	Next steps
Simple assessment	31 private viewpoints and 13 public viewpoints (from public roads and rail lines) were considered in the simple visual impact assessment. With consideration of vertical and horizontal fields of view, 15 private viewpoints and eight public viewpoints triggered an intermediate visual impact assessment.	Intermediate visual impact assessment required
Intermediate assessment Wireframes are produced to more accurately determine the magnitude rating.	Private viewpoints: • High visual impact: Two viewpoints (PR_2 and PR_6) • Moderate visual impact: Three viewpoints (PR_1, PR_5, X05) • Low or very low visual impact: remaining ten viewpoints Public viewpoints: • No high visual impacts • Moderate visual impact: Five viewpoints (VP03, VP04, VP06, VP08, VP13) • Low or very low visual impact: remaining three public viewpoints.	Detailed assessment required for 10 viewpoints deemed to have moderate and high impacts
Detailed assessment Photomontages are prepared to more accurately assess potential impacts.	Private viewpoints: • Low visual impact: All viewpoints. Photomontages demonstrate that the visibility of the Project at these locations will be screened due to the established vegetation. Public viewpoints: • Moderate visual impact: One viewpoint (VP06) • Low or very low visual impact: remaining four public viewpoints. The visibility of the Project at these locations will be fragmented or screened due to the established roadside vegetation.	Mitigation measures required for viewpoints with a moderate visual impact (refer to Section **6.6.5**).

Lots with dwelling entitlements

There are 38 lots with dwelling entitlements within 4 km of the Project Area. These lots have been assessed as part of the visual impact assessment with the potential for private viewpoints to be present in the future. A summary of the potential visibility of the Project from lots is summarised in **Table 6-36**. It is important to understand that the viewshed mapping used for this assessment represents a bare ground scenario and does not consider intervening elements such as vegetation and structures. No lots were identified as having constraints to future development rights as a result of the Project.

Table 6-36 Summary of dwelling entitlement assessment

Potential visibility of the Project across a lot	Number of lots
0% (no visibility)	5
up to 25%	7
up to 50%	15
up to 75%	10
up to 100%	1

BESS and substation infrastructure

The associated infrastructure including the BESS, main substation, secondary substations, workers accommodation, 33kV transmission lines and 330kV transmission lines were included in the visualisations for the intermediate and detailed assessment. While the BESS and main substation are sited away from roads and will have a minimal visual impact on surrounding public viewpoints, the three secondary substations are located adjacent to Sandy Creek Road and will likely be visible. However, Sandy Creek Road is an unsealed, low-use road with a low sensitivity and lies within a low scenic quality area. Views from non-associated dwellings within 2.5 km of the BESS and substations are limited due to the distance and existing intervening elements, such as vegetation and surrounding ancillary buildings. Therefore, the presence of the BESS and substation infrastructure will not be detrimental to the existing landscape character.

The Project involves a 330 kV and 33 kV transmission line network along Sandy Creek Road, connecting PV arrays to on-site substations. As per the 2024 NSW transmission guidelines (DPHI, 2024c), only dwellings within 1.1 km of transmission easements need to be considered. Two non-associated dwellings (PR_5 and PR_6) are within this range. The detailed assessment found both have a low visual impact rating. PR_06's view of the Project is blocked by dense vegetation, and PR_5's view is limited by distance and intervening vegetation.

Night lighting

Due to the relatively isolated location of the Project, there are few existing sources of lighting in the night-time landscape. During operation, night lighting of ancillary infrastructure will only be required for security lighting at the substations, BESS, operation office, and storage facility. It is unlikely that the proposed night lighting will create a noticeable impact on the existing night-time landscape due to light sources being limited to a low brightness and positioned to minimise visibility from viewpoints.

Glint and glare

Results of the glint and glare assessment are summarised in **Table 6-37**. The assessment provides worst-case results based on topography alone and does not account for existing screening elements such as vegetation or structures. Glare can be broadly classified into three categories:

- Green glare: low potential for temporary after-image
- Yellow glare: potential for temporary after-image
- Red glare: high potential for permanent eye damage, not expected for solar panels.

The main focus of this assessment is yellow glare. Red glare is not expected for solar panels and green glare has low potential to cause after image and deemed negligible (Ho, 2011).

Impact ratings for glare impacts on receptors are listed below. Glint and glare impacts are categorised on the following basis:

- Low impact: less than 10 hours per year
- Moderate impact: greater than 10 hours and less than 30 hours per year
- High impact: greater than 30 hours per year.

Table 6-37 Glint and glare impacts

Viewpoints	Description of impact
Residential	19 private receptors were identified to be within 3 km of the Development Footprint. Based on the glare assessment scenario, no potential “Yellow” or “Green” glare has been identified for any non-associated dwellings within the Study Area.
Road	Six (6) road receptors were identified within 1 km of the development footprint: Golden Highway, Spring Ridge Road, Danabar Road (unsealed), Sandy Creek Road (unsealed), Sweeneys Lane (unsealed), and Tallawonga Road (unsealed). The glare assessment indicates that Spring Ridge Road (82.8 hours per year), Sweeneys Lane (59.9 hours per year) and Tallawonga Road (273.2 hours per year) experience potential “Green” glare. The potential for after-image from “Green” glare is low; however, it may cause eye strain if observed for long periods. Due to the speed of travel along the road and rail routes, the time frame to experience the impacts of “Green” glare are short, therefore, the impacts of “Green” glare are low and do not require mitigation. The glare assessment indicates that no roads have the potential to experience “Yellow” glare.
Rail	No rail receptors were identified within 1 km of the solar array area.
Aviation	No aviation receptors were identified within 5 km of the Development Footprint.

Management and mitigation measures will be implemented for receptors that are subject a moderate or high glint and glare impact, in line with the Solar Guideline (refer to **Section 6.6.5**).

6.6.5 Management and mitigation measures

Management and mitigation measures that will be implemented for the Project to address potential landscape and visual impacts are listed in **Table 6-38**.

Table 6-38 Management and mitigation measures – landscape and visual

ID	Management and mitigation measure	Timing
V1	Lighting will be designed and installed in accordance with *AS4228-1997 - Control of Obtrusive Effects of Outdoor Lighting* and will follow best practice lighting principles identified within the Dark Sky Planning Guidelines.	Detailed design and Construction
V2	Non-reflective surface treatments will be applied to buildings and structures where practical to minimise reflection.	Detailed design
V3	Ancillary components of the Project will be designed to minimise visual impact as much as possible.	Detailed design
V4	A Landscape Plan will be prepared and will detail strategic planting to screen views and glare in accordance with the Landscape and Visual Impact Assessment.	Construction
V5	If the Project results in a cumulative visual impact additional screen planting will be provided on completion of the construction of Dapper Solar Farm and Sandy Creek Solar Farm.	Operation

6.7 Noise and vibration

6.7.1 Secretary's Environmental Assessment Requirements

Table 6-39 sets out the SEARs relevant to noise and vibration and where the requirements have been addressed in this EIS.

Table 6-39 SEARs – Noise and vibration

Relevant SEARs	
Noise	**Where addressed**
The EIS must address the following specific matters: • an assessment of the construction noise impacts of the development in accordance with the Interim Construction Noise Guideline (ICNG), operational noise impacts in accordance with the NSW Noise Policy for Industry (2017), cumulative noise impacts (considering other developments in the area), including (where appropriate):	The NVIA has been prepared in accordance with the relevant guidelines as detailed in Section 1.6 of **Appendix I (Noise and Vibration Impact Assessment)**.
- identification of impacts associated with construction, site emission and traffic generation at noise affected sensitive receivers, including the provision of operational noise contours;	An assessment of construction and operational noise, and construction vibration impacts is provided in **Section 6.7.4**. Noise contours are provided in **Appendix I (Noise and Vibration Impact Assessment)**.
- details of noise monitoring survey, background noise levels and amenity noise levels at the most-affected residential receivers;	Details of the existing noise environment and amenity noise levels are presented in **Section 6.7.2** and **Section 6.7.3**. Survey details are presented in **Appendix I (Noise and Vibration Impact Assessment)**.
- details of manufacturer specifications for plant and equipment and noise source inventory (demonstrating worst-case modelling of plant and equipment);	Details of manufacturer specifications for plant and equipment utilised in the assessment are presented in **Appendix I (Noise and Vibration Impact Assessment)**.
- an assessment of 'worst case' noise emission scenarios; - consideration of annoying characteristics of noise and prevailing meteorological conditions in the study area; and	An assessment of 'worst case' construction and operational noise and construction vibration impacts is provided in **Section 6.7.4**, including consideration of the site's prevailing meteorological conditions.
- details and analysis of the effectiveness of proposed management and mitigation measures to adequately manage identified impacts, including a clear identification of residual noise and vibration impacts following application of these mitigation measures and details of any proposed compliance monitoring programs.	Analysis of the effectiveness of measures, identification of residual impacts and details of proposed compliance monitoring programs are addressed within the mitigation measures presented in **Section 6.7.5**

6.7.2 Methodology

A Noise and Vibration Impact Assessment (NVIA) was prepared by AECOM to assess the potential noise and vibration impacts associated with construction and operation of the Project. This is included as **Appendix I (Noise and Vibration Impact Assessment)**.

Table 6-40 provides a summary of relevant terminology used throughout this section to aid the assessment of noise and vibration impacts. Terminology and definitions are from the Noise Policy for Industry (NPfI) (NSW EPA, 2017) (refer to **Section 3.3.5** for construction hours for the Project).

Table 6-40 Noise and vibration assessment terminology (NSW EPA, 2017)

Terminology	Definition
Background noise	The underlying level of noise present in the ambient noise when extraneous noise (such as transient traffic and dogs barking) is removed. The L_{90} sound pressure level is used to quantify background noise.
Day	**Construction noise:** The period from 0700 to 1800 h Monday to Saturday and 0800 to 1800 h Sundays and Public Holidays. **Road traffic noise:** The period from 0700 to 2200 h every day of the week.
Evening	**Construction noise:** The period from 1800 to 2200 h Monday to Sunday and Public Holidays. **Road traffic noise:** Not applicable.
Night	**Construction noise:** The period from 2200 to 0700 h Monday to Saturday and 2200 to 0800 h Sundays and Public Holidays. **Road traffic noise:** The period from 2200 to 0700 h every day of the week.
Rating background level (RBL)	The overall background level for each day, evening and night period for the entire length of noise monitoring.
Noise management level (NML)	The level which represents the point above which there may be some community reaction to noise.

The following steps were undertaken when preparing the NVIA:

- Identify noise and vibration sensitive receivers in the vicinity of the Project
- Characterise the existing noise environment to determine rating background levels (RBLs) in accordance with the NPfI (NSW EPA, 2017)
- Determine Project-specific noise and vibration management levels in accordance with relevant guidelines and criteria
- Develop representative worst-case construction and operational noise levels for input into SoundPLAN 8.2 noise modelling software using the CONCAWE method
- Quantify potential construction and operational noise impacts for the Project through modelling of noise contours, with consideration of:
  - Annoying characteristics of noise (i.e., tonality and low frequency noise)
  - The prevailing meteorological conditions of the region.
- Assess the significance of the potential noise impacts identified

- Assess potential construction vibration impacts with consideration of criteria for structural damage and human comfort[1]
- Identify appropriate mitigation measures that will be implemented to manage identified noise and vibration impacts, including an analysis of their likely effectiveness and proposed compliance monitoring
- Identify any residual noise and vibration impacts following the application of mitigation measures.

Construction noise criteria

Under the NSW Interim Construction Noise Guideline (ICNG), noise management levels (NMLs) are calculated to determine noise impacts on receiver thresholds during construction activities. These thresholds include:

- The '**noise affected level**': the point at which construction noise may result in some community reaction. This is calculated as RBL + 10 dB(A) for standard daytime construction hours. RBLs are presented in **Section 6.7.3**
- The '**highly noise affected level**': a fixed threshold of 75 dB(A). This is defined by the ICNG as the point where construction noise may result in a strong community reaction.

Project-specific NMLs for noise sensitive residential receivers have been calculated for standard daytime construction hours (Monday to Friday 7am to 6pm, Saturday 8am to 1pm) (**Table 6-41**).

Table 6-41 Construction NMLs – residential receivers

Time of day	RBL, dB(A)	NML, dB(A)
Day - standard construction hours	35	45

Criteria for noise arising from construction traffic on public roads is determined using the NSW Road Noise Policy (RNP). Under the RNP, thresholds for construction traffic noise increases are:

- **2 dB(A) increase or less:** Considered negligible and typically not significant.
- **Greater than 2 dB(A):** Further consideration against road category specific criteria is required (these criteria are reproduced in **Table 6-42)**. Exceedances of road category specific criteria may require further assessment or mitigation.

Table 6-42 Road traffic noise assessment criteria

Road category	Traffic noise assessment criteria	
	Day (7am – 10pm)	Night (10pm – 7am)
Freeway/arterial/sub-arterial roads	$L_{Aeq,15hr}$ 60 dB(A)	$L_{Aeq,9hr}$ 55 dB(A)
Local roads	$L_{Aeq,1hr}$ 55 dB(A)	$L_{Aeq,1hr}$ 50 dB(A)

Construction vibration criteria

Cosmetic structural damage criteria are set out in *British Standard (BS) 7385:Part 2-Evaluation and Measurement for Vibration in Buildings Part 2, (1993)* and human comfort criteria are detailed in the EPA's *Assessing Vibration: a Technical Guideline.* Transport for NSW's *Construction Noise and Vibration Guideline (Roads)* (CNVG-R) recommends minimum working distances are applied to minimise disturbance to occupants of nearby buildings (**Table 6-43**) and to achieve criteria outlined in the British Standard and EPA documents referenced above.

[1] Operational vibration was not assessed due to the negligible impacts associated with the operation of a solar farm and associated infrastructure.

Table 6-43 Recommended minimum working distances for vibration intensive plant

Plant	Rating/Description	Safe Working Distance	
		Cosmetic Damage	Human Response
Impact Piling	30 kJ per blow	23 m	100 m
Pile Boring	≤ 800 mm	2 m (nominal)	N/A

Operational noise criteria

Project-specific noise criteria for operation has been established using the guidance provided in the NPfI (**Table 6-44**). Project-specific criteria is selected as the lowest of the intrusive noise and the amenity noise criteria:

- **Intrusive noise criteria** is calculated as the RBL + 5 dB(A) and prevents noise from 'standing out' against the background noise environment.
- **Amenity noise criteria** are determined from acceptable levels presented in the NPfI and limit continuing increases in noise from new industrial noise sources in the area.

Table 6-44 Project specific noise criteria

Receiver	Period	RBL ($L_{A90, 15\ min}$)	Intrusive criteria ($L_{Aeq, 15\ min}$)	Amenity criteria ($L_{Aeq, Period}$)	Project specific noise criteria, (L_{Aeq})
All nearby residential receivers	Day	35	40	48	40
	Evening	30	35	43	35
	Night	30	35	38	35

The NPfI provides additional guidance and criteria for assessing noise emissions from sources with "annoying characteristics" such as tonality, impulsiveness, intermittency, irregularity or dominant low-frequency content. Penalties of up to a maximum of 10 dB(A) may be applied where the subject noise has such characteristics at the receiver.

6.7.3 Existing environment

Noise sensitive receivers

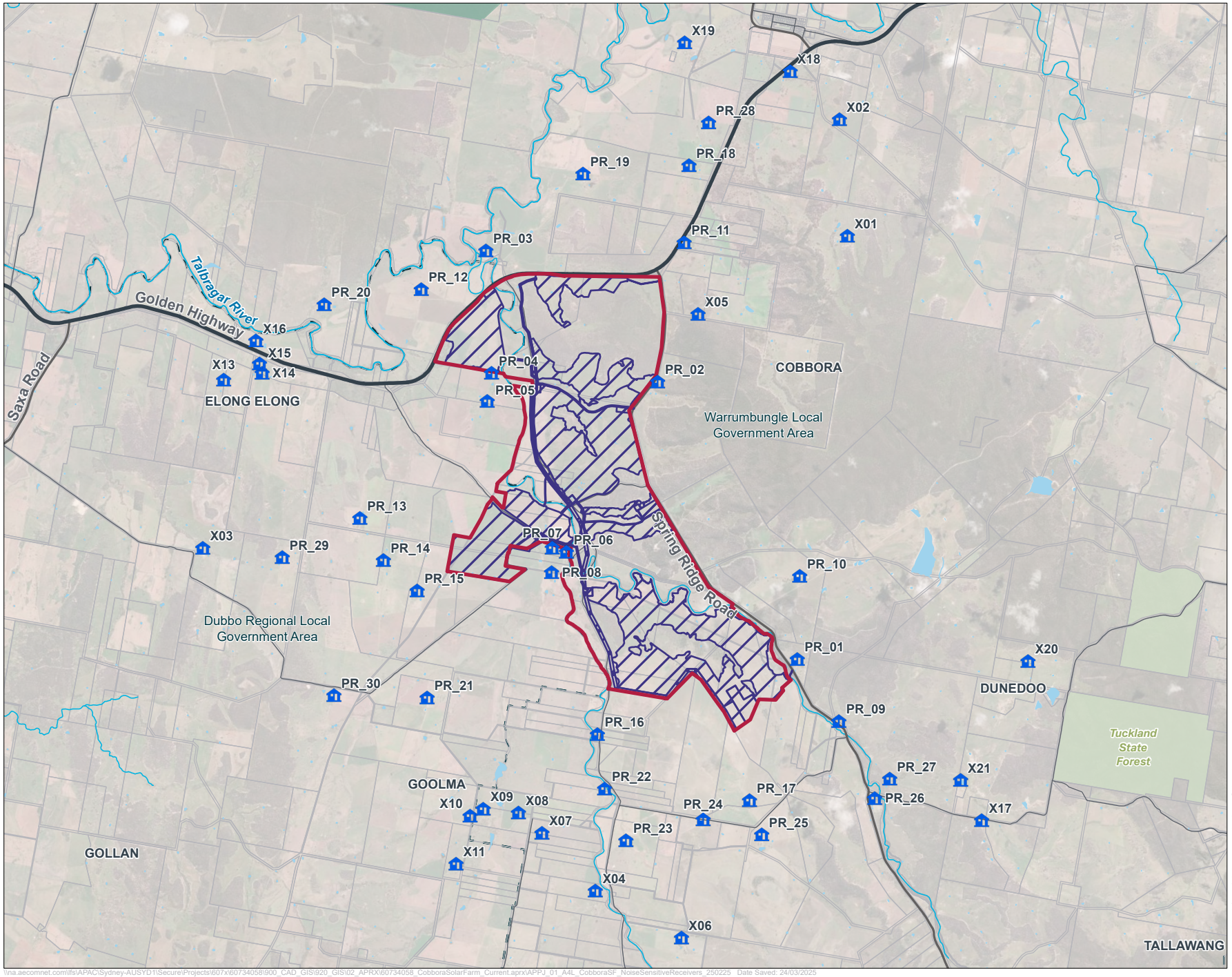
Non-associated residential receivers are located in all directions from the Project Area (**Figure 6-17**), with the closest being approximately 68 m from the Development Footprint (PR_06). A complete list of assessed receivers is provided in **Appendix I (Noise and Vibration Impact Assessment)**.

Rating background levels

Minimum assumed RBLs provided in the NPfI have been used (**Table 6-45)** to determine construction NMLs and operational noise criteria. The RBLs have been compared to background noise logging levels undertaken by AECOM at other remote rural areas in NSW and are considered to be representative.

Table 6-45 Rating background levels

Time of day	Minimum assumed rating background noise level dB(A)
Day 0700-1800	35
Evening 1800 – 2200	30
Night 2200 – 0700	30



AECOM

N

0 1 2 km

Legend

- Project Area
- Development Footprint
- State forest
- National parks and reserves
- Waterbody
- Local government area
- Watercourses
- Motorway
- Main road
- Local road
- Sensitive receivers

FIGURE 6-17: NOISE SENSITIVE RECEIVERS SURROUNDING THE PROJECT

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Source: Earthstar Geographics

6.7.4 Impact assessment

Construction

Construction noise

The NVIA assessed four construction noise modelling scenarios:

- Scenario 1: Site establishment
- Scenario 2: Construction of solar farm, BESS, substations and associated infrastructure
- Scenario 3: Commissioning
- Scenario 4: Demobilisation and rehabilitation works.

The above construction noise scenarios were modelled in SoundPLAN 8.2 with all construction equipment assumed to be operating simultaneously and at the nearest point of the Project Area boundary to sensitive receivers under neutral atmospheric conditions i.e. relatively calm, no wind, so as to represent a worst-case scenario. Construction noise contours were calculated at 1.5 m above ground level.

Predicted construction noise levels derived from the modelling were then compared to the NML for sensitive receivers near the Project Area. Based on these results, construction noise is predicted to comply with the NMLs at most receiver locations with the exception of:

- Three receivers during Scenario 1 (exceedances of 10-17 dB)
- Six receivers during Scenario 2 (exceedances of 1-22 dB)
- Three receivers during Scenario 3 (exceedances of 1-8 dB)
- Three receivers during Scenario 4 (exceedances of 5-12 dB).

During Scenario 1 works noise will be clearly audible at times at affected receivers.

Scenario 2 results in the most exceedances due to the use of noisy activities such as piling and concrete sawing. In the worst-case, noise levels during this construction scenario will be moderately intrusive at times at affected receivers. However, these activities are only expected to occur intermittently and at locations more central to the Project Area (i.e. further from receivers). Piling activities would cause the highest construction noise levels at receivers and are likely to be undertaken for a period of nine months. It should be noted that the piling activities would move progressively around the Development Footprint, and therefore any one receiver would be affected for a limited period of time.

During Scenario 3 and 4 works noise may be typically noticeable at times at affected receivers. A list of the residential receivers where exceedances of the NML were observed is provided in **Table 6-46**. These exceedances are considered to be worst-case. Noise levels will be substantially lower than presented in **Table 6-46** for significant periods of time during construction (i.e. when high noise generating activities are not being undertaken).

An estimated duration of exceedances at receivers PR_01, PR_02 and PR_06 during each scenario is provided in **Appendix I (Noise and Vibration Impact Assessment)**. As noted in the modelling assumptions, these exceedances assume all equipment would be operating at the same time at the closest point in the site to each receiver. In reality the equipment would only be at the closest point to each receiver for limited periods within the estimated durations.

The construction noise levels at all receivers for all construction scenarios are predicted to be below the ‘highly noise affected’ level of 75 dB(A) (in accordance with the ICNG).

Table 6-46 Predicted construction noise levels

Receiver	Daytime NML, dB(A)	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
		Predicted noise level, dB(A)	Exceedance, dB(A)	Predicted noise level, dB(A)	Exceedance, dB(A)	Predicted noise level, dB(A)	Exceedance, dB(A)	Predicted noise level, dB(A)	Exceedance, dB(A)
PR_01	45	58	**13**	63	**18**	49	**4**	53	**8**
PR_02	45	62	**17**	67	**22**	53	**8**	57	**12**
PR_03	45	42	-	47	**2**	33	-	37	-
PR_05	45	41	-	46	**1**	32	-	36	-
PR_06	45	55	**10**	60	**15**	46	**1**	50	**5**
PR_11	45	41	-	46	**1**	32	**-**	36	-
PR_15	45	40	-	45	**1**	31	**-**	35	-

Construction traffic noise

Information on predicted construction traffic is provided in **Section 6.8**. Existing and predicted additional daytime flows, the relative noise increase, and indicative traffic noise level at the nearest residential receivers are presented in **Table 6-47** (for the Golden Highway) and **Table 6-48** (for Spring Ridge Road).

The results of the assessment indicate that traffic noise level increases on the Golden Highway are likely to be less than 2 dB(A) during the peak construction period. Therefore, no further consideration is required, in accordance with the RNP.

Noise increases on Spring Ridge Road are likely to be more than 2 dB(A) during the peak construction period. However, the $L_{Aeq,1\ hr}$ traffic noise level is less than the RNP criteria of $L_{Aeq,1hr}$ 55 dB(A). Therefore, no further assessment has been undertaken.

Overall, construction traffic noise impacts are expected to be minor.

Table 6-47 Existing traffic flows and additional construction traffic – Golden Highway

Road	Existing daytime flow[1,2]		Additional daytime flow		Relative noise increase, dB(A)	Distance to nearest residential receiver from road, m	Indicative $L_{Aeq,15hr}$ traffic noise level at nearest receiver, dB(A)
	Light	Heavy	Light[3]	Heavy			
Golden Highway	82	22	48	88	1.0	44	58

Notes:

1. *Reference: Sandy Creek Solar Farm Traffic Impact Assessment, EMM, 2023*
2. *85% of total traffic has been estimated to be daytime traffic*
3. *Light vehicles include bus/van movements, heavy vehicles include B-double trucks and over-dimensional vehicles*

Table 6-48 Existing traffic flows and additional construction traffic – Spring Ridge Road

Road	Existing daytime peak hourly flow[1]		Additional daytime peak hourly flow		Relative noise increase, dB(A)	Distance to nearest residential receiver from road, m	Indicative $L_{Aeq,1hr}$ traffic noise level at nearest receiver, dB(A)
	Light	Heavy	Light[2,3]	Heavy[2,4]			
Spring Ridge Road	1	1	24	4	9.0	120	47

Notes:

1. *Reference: Sandy Creek Solar Farm Traffic Impact Assessment, EMM, 2023*
2. *Light vehicles include bus/van movements, heavy vehicles include B-double trucks and over-dimensional vehicles*
3. *Assumes all light vehicles arrive during the first hour of the work day*
4. *Assumes heavy vehicle traffic is evenly spread throughout the work day.*

Helicopter movements and workers accommodation

The Project will include a main construction support area in the central portion of the Project Area. This area will also include an accommodation camp and helicopter landing site. The helicopter landing site is only intended to be used in an emergency/evacuation situation, and therefore no further assessment of its use is required.

Noise generated from the accommodation camp (mechanical plant, vehicular movements etc.) are expected to be minimal as the camp is located approximately 2.4 km from the nearest noise sensitive receiver.

Vibration

The only significant vibration intensive works expected to take place during construction will be impact piling. The safe working distances for structural damage and human response identified in **Table 6-43** will be complied with when using piling rigs during construction and as such no construction vibration impacts are expected.

Operation

Operational noise levels

The operational noise assessment has assessed all operational elements together, separating elements into daytime, evening and night-time scenarios. All operational and maintenance activities and equipment are planned to occur during daylight hours has been subject to daytime noise criteria only. Given that a solar farm generates electricity only during daylight hours, its operations are subject to daytime and evening noise criteria. The BESS may operate at any time in a 24 hour period, it is subject to daytime, evening and night time noise criteria, whilst the night-time criteria was used to assess the operation of the BESS and substation only.

Noise levels arising from the operation of Project equipment have been predicted at nearby noise sensitive receivers using SoundPLAN 8.2 noise modelling software. These predicted noise levels were assessed against Project-specific noise criteria as seen in **Table 6-44**. Operational noise contours were calculated at 1.5 m above ground level.

The operational noise assessment indicates that daytime noise levels from the Project are compliant at all receivers.

Noise levels are predicted to comply with the most stringent (evening time) operational noise criteria at all locations. However, with the application of a conservative assumption of equipment tonality (applied through a 5dB correction factor), noise levels may exceed the Project-specific noise limits at three receivers (exceedances between 3 dB and 5 dB), in a rare worst-case scenario. It is expected that the BESS (which has been modelled at 100% duty load) and the solar farm inverters (which have been modelled at 100% load and fan speed), would operate at a reduced load in the evening compared to during the daytime and as such the noise emission levels would also be reduced. Nonetheless, in the event that noise modelling at detailed design indicates that exceedances persist, the Project has identified an alternative layout option with four solar farm inverters relocated away from receivers. Modelling indicates that this alternative layout option, which also considers the effects of acoustic shielding provided by the solar array panels. would reduce noise levels to within Project-specific noise limits, except for negligible (1 dB) exceedances predicted at two receivers (PR_02, PR_06).

Night-time noise levels are predicted to be compliant for all receivers.

Residential receivers where exceedances of the Project-specific noise criteria were observed are presented in **Table 6-49**.

Operational road traffic levels

Minimal traffic movement generation is expected as a result of the operation of the Project as the workforce expected is less than 20 workers. Noise impacts arising from operational traffic are considered negligible as an increase of more than 2 dB will not occur.

Table 6-49 Predicted operational noise levels under adverse weather conditions

Receiver	Daytime scenario				Evening scenario				Night-time scenario			
	Noise criterion L_{Aeq} dB(A)[1]	Low frequency or tonality penalty	Predicted L_{Aeq} noise levels, dB(A)[2]	Exceedance, dB(A)	Noise criterion, L_{Aeq} dB(A)[1]	Low frequency or tonality penalty	Predicted L_{Aeq} noise levels, dB(A)[2]	Exceedance, dB(A)	Noise criterion, L_{Aeq} dB(A)[1]	Low frequency or tonality penalty	Predicted L_{Aeq} noise levels, dB(A)[2]	Exceedance, dB(A)
PR_01	40	Yes	40	-	35	Yes	40	**5**	35	No	27	-
PR_02	40	Yes	40	-	35	Yes	40	**5**	35	No	<25	-
PR_06	40	Yes	38	-	35	Yes	38	**3**	35	No	<25	-

6.7.5 Management and mitigation measures

Management and mitigation measures that will be implemented for the Project to address potential noise and vibration impacts are listed in **Table 6-50**.

Most impacts identified in the above assessment can be avoided or mitigated by employing a combination of standard measures provided in **Appendix I (Noise and Vibration Impact Assessment)**.

Table 6-50 Management and mitigation measures – noise and vibration

ID	Management and mitigation measure	Timing
N1	The Noise and Vibration Impact Assessment prepared for the EIS (provided in **Appendix I (Noise and Vibration Impact Assessment)**) will be re-evaluated based on the detailed design to confirm noise predictions and potential impacts and associated mitigation measures are still valid.	Detailed design
N2	A Construction Noise and Vibration Management Plan (CNVMP) will be prepared as a sub plan to the CEMP. The CNVMP will identify: • Potential significant noise and vibration generating activities associated with the activity, as outlined in the Noise and Vibration Impact Assessment • Noise and vibration sensitive receivers • Measures to be implemented during construction to minimise noise and vibration impacts, such as restrictions on working hours, staging, placement and operation of work compounds, parking and storage areas, temporary noise barriers, haul road maintenance and controlling the location and use of vibration generating equipment • Arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures.	Construction
N3	Sensitive receivers that are likely to be affected by Project construction noise will be notified at least five days prior to commencement of any works that may result in an adverse noise and/or vibration impact upon them. The notification will include details of: • The nature of the construction work • Construction period and construction hours • Contact information for Project staff, both on-site and off-site • Complaint and incident reporting and how to obtain further information.	Construction
N4	Construction will generally be carried out during the standard daytime working hours (as defined in the NSW Interim Construction Noise Guideline). Works generating high noise and/or vibration levels will be scheduled during less sensitive time periods.	Construction
N5	Construction activities proposed for non-standard hours (as defined in the NSW Interim Construction Noise Guideline) and unlikely to satisfy the noise criteria at nearby sensitive receivers will be conducted with approval from relevant authorities and in consultation with affected landholders, except during an emergency where works will be undertaken without consultation.	Construction
N6	High noise generating work (>75 dB(A) L_{Aeq} at receiver) carried out during standard construction hours will be in continuous blocks of no more than three hours with at least one hour respite between	Construction

ID	Management and mitigation measure	Timing
	each block, where the location of the work is likely to impact the same receiver.	
N7	Where high noise generating activities (>75 dB(A) L_{Aeq} at receiver) are required out of standard working hours: • These works will be scheduled before 10:00 pm, where feasible and reasonable • Where the above cannot be achieved, no works will occur after midnight.	Construction
N8	For deliveries to and from the Project Area: • Loading and unloading of materials/deliveries will occur in designated loading or unloading points. Where this is not feasible loading and unloading will take place in areas away from sensitive receivers as far as practicable • Construction sites near sensitive receivers will be designed to minimise the need to reverse vehicles (and hence trigger reversing alarms)	Construction
N9	Non-tonal reversing beepers (or an equivalent mechanism) will be fitted and used on all construction vehicles and mobile plant regularly used on site.	Construction
N10	Consideration will be given to the layout of construction compounds (positioning of site sheds, earth bunds and hoarding) to maximise distance and shielding of fixed and mobile plant and truck movements to nearby receivers.	Detailed design and Construction
N11	Vibration intensive equipment size will be selected to avoid working within the structural damage minimum working distances. The use of less vibration intensive methods of construction or equipment will be considered where feasible and reasonable.	Detailed design and Construction
N12	Where vibration intensive works cannot be avoided within minimum working distances, vibration monitoring should be undertaken to determine site specific minimum working distances and to ensure that appropriate thresholds are not exceeded.	Detailed design and Construction

6.8 Traffic and transport

6.8.1 Secretary's Environmental Assessment Requirements

Table 6-51 sets out the SEARs relevant to traffic and transport and where the requirements have been addressed in this EIS.

Table 6-51 SEARs – Transport

Relevant SEARs	
Transport	**Where addressed**
The EIS must address the following specific matters: • an assessment of the peak and average traffic generation, including light vehicles, shuttle buses, heavy vehicles and heavy vehicles requiring escort, construction worker transportation and transport of materials by rail	Peak and average traffic generation is discussed in **Section 6.8.4**.
• an assessment of the likely transport impacts to the site access route (including, but not limited to, Golden Highway, Spring Ridge Road, Danabar Road, Sandy Creek Road, Sweeneys Lane and Tallawonga Road), site access points, particularly in relation to the capacity and condition of the roads	Transport impacts on the site access route is discussed in **Section 6.8.4**. Noting that under the revised project description Sandy Creek Road, Sweeneys Lane and Tallawonga Road are

Relevant SEARs	
	no longer being utilised as part of the project.
• an assessment of whether there will be any likely transport impacts to local heritage items which adjoin any proposed haulage routes	Impacts to Aboriginal cultural heritage are discussed in **Section 6.3** and non-Aboriginal heritage in **Section 6.4**.
• a cumulative impact assessment of traffic from nearby developments including but not limited to Spicers Creek Wind Farm, Dunedoo Solar Farm, Birriwa Solar Farm, Tallawang Solar Farm and Barneys Reef Wind Farm	Cumulative impacts from construction and operation are discussed in **Section 6.15**.
• provide details of measures to mitigate and / or manage potential impacts (developed in consultation with the relevant road authorities) including: - a schedule of all required road upgrades (including resulting from heavy vehicle and over mass / over dimensional traffic haulage routes), - clear figures of proposed road upgrades (including the site access point), and - road maintenance contributions, and any other traffic control measures.	Mitigation and measurement measures are discussed in **Section 6.8.5**. A schedule of required road upgrades and maintenance is provided in **Section 6.8.4** and **6.8.5**. Consultation with Transport for NSW and Warrumbungle Shire Council has been undertaken in regard to access and haulage routes (refer to **Table 5-4**).

6.8.2 Methodology

A Traffic and Transport Impact Assessment (TTIA) has been prepared to assess potential transport and traffic impacts associated with the construction, operation, and decommissioning of the Project. This report is attached as **Appendix H (Traffic and Transport Impact Assessment)**. This report:

- Established the existing traffic and access conditions, as well as the current status of active transport and public transport networks near the Project
- Confirms the location of access points, anticipated vehicle movements and likely routes during the construction of the Project
- Provides a qualitative impact assessment of potential impacts of the Project on the local traffic, road safety, public transport, parking and access environment during the construction, operation, and decommissioning phases of the Project, and proposes mitigation measures for managing these impacts, should they be required.

Assessment scenarios

The peak construction period is likely to occur in 2028 and, as such, 2028 has been used as the worst-case assessment year for construction traffic. In addition, 2038 has been considered for assessing the future year operations. For both future years a 1% average annual growth rate has been applied to the existing traffic volumes to estimate the AM peak hour and PM peak hour traffic volumes on the Golden Highway and Spring Ridge Road.

To assess the impacts on the surrounding road network, the following scenarios were considered for a typical weekday during the AM and PM peak hours:

- Future base scenario in 2028 – the future year 2028 scenario with background traffic growth only
- Future base scenario in 2028 with construction – the future year 2028 scenario with background traffic growth plus Project construction traffic
- Future base scenario in 2038 – the future year 2038 scenario with background traffic growth only
- Future scenario in 2038 with operation – the future year 2038 scenario with background traffic growth plus Project operational traffic.

6.8.3 Existing environment

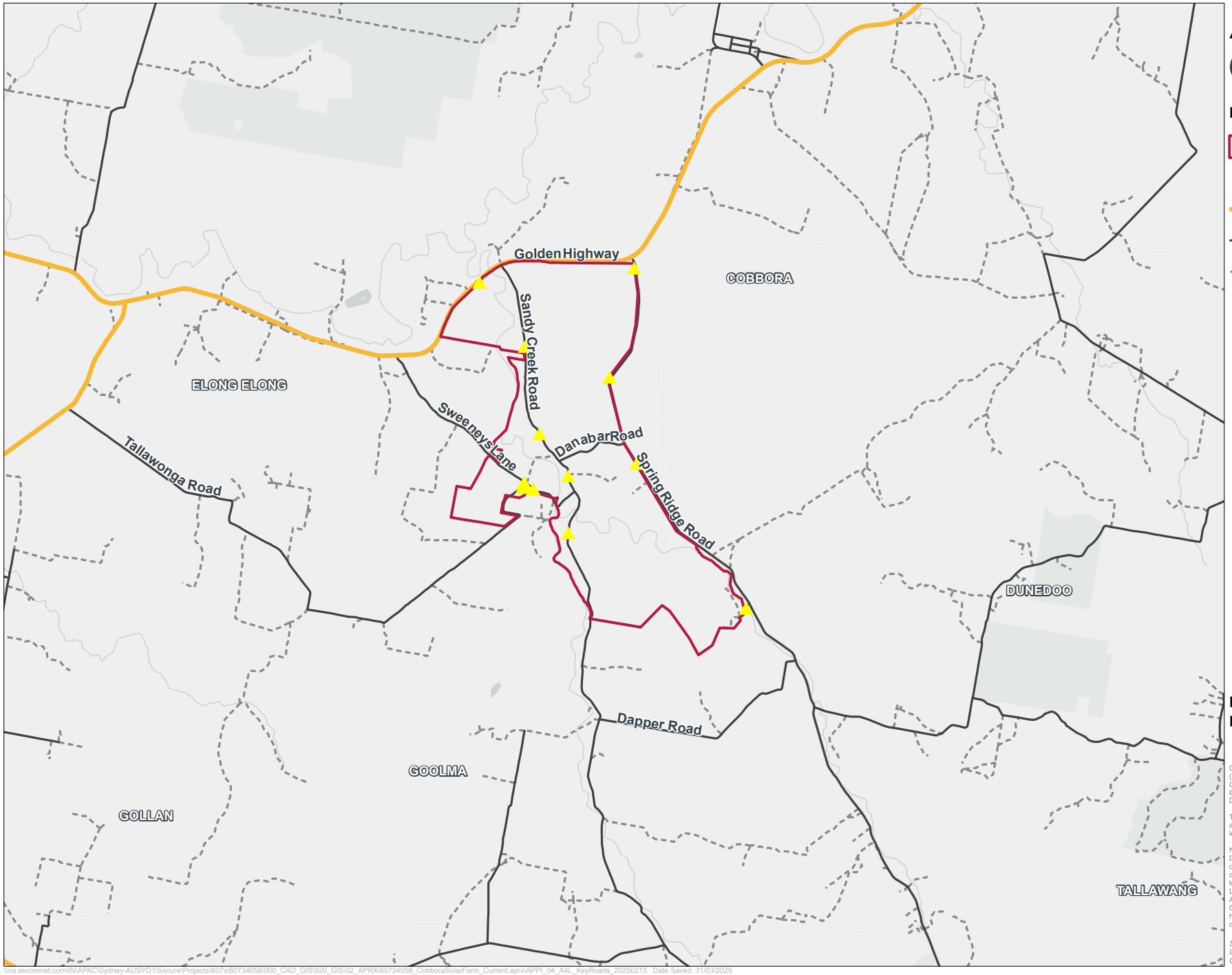
Surrounding road network

The road network in the vicinity of the Project Area includes Spring Ridge Road, the Golden Highway, Danabar Road, Sandy Creek Road, Sweeneys Lane, and Tallawonga Road. A summary of roads surrounding the Project Area is detailed in **Table 6-52** and shown on **Figure 6-18**.

Table 6-52 Other roads surrounding the Project Area

Other roads	Description
Golden Highway	• The Golden Highway is a classified State Road (B84) operated by Transport for NSW and is generally aligned in an east-west direction to the north of the Project Area. The highway extends from Dubbo (west) to Newcastle (east). Near the Project Area, the highway is an undivided carriageway, with one lane in each direction. The posted speed limit is 100 kilometres per hour for vehicles travelling in both directions. No parking or footpaths are provided on either side of the highway near the Project Area. • At the intersection of Golden Highway/Spring Ridge Road, additional short turning lanes are available for turning vehicles approaching the intersection from either direction (approximately 45 metres from the intersection in the west approach and 85 metres in the east approach).
Springe Ridge Road	• Spring Ridge Road is a two-way sealed rural road with an undivided carriageway operated by Warrumbungle Shire Council and is generally aligned in a north-south direction. Spring Ridge Road joins the Golden Highway to the north and the Castlereagh Highway to the south via Laheys Creek Road. Spring Ridge Road also provides access to other rural roads in the vicinity of the Project Area including Danabar Road, Dapper Road, Sandy Creek Road and Laheys Creek Road. No footpaths are provided on either side of these roads.
Danabar Road	• Unsealed rural road operated by Warrumbungle Shire Council • Generally aligned in an east-west direction through the Project Area • Connects to Spring Ridge Road in the east and Sandy Creek Road in the west • No footpaths or parking.
Dapper Road	• Unsealed rural road operated by Warrumbungle Shire Council • Generally aligned in an east-west direction along the Project Area boundary • Connects to Spring Ridge Road in the east and Sandy Creek Road in the west • Two dwellings within the vicinity of the Project can be accessed from Dapper Road • No footpaths or parking.
Sandy Creek Road	• Unsealed rural road operated by Warrumbungle Shire Council • Generally aligned in a north-south direction through the Project Area • Connects the Golden Highway in the north and Spring Ridge Road in the south • Two dwellings within the vicinity of the Project can be accessed from Sandy Creek Road • No footpaths or parking.
Sweeneys Lane	• Unsealed rural road operated by Dubbo Regional Council (west of Sandy Creek) and Warrumbungle Shire Council (east of Sandy Creek) • Generally aligned in a north-south direction adjacent to the Project Area • Connects the Golden Highway in the north and Sandy Creek Road in the south and provides access to Tallawonga Road

Other roads	Description
	• Two dwellings within the vicinity of the Project can be accessed from Sweeneys Lane • No footpaths or parking.
Tallawonga Road	• Unsealed rural road operated by Dubbo Regional Council • Generally aligned in an east-west direction west of the Project Area • Connects to Sweeneys Lane to the east and Saxa Road to the west • Two dwellings within the vicinity of the Project can be accessed from Tallawonga Road • No footpaths or parking.
Laheys Creek Road	• Unsealed rural road operated by Warrumbungle Shire Council • Generally aligned in an east-west direction south of the Project Area • Connects Spring Ridge Road to the west and Castlereagh Highway to the east • Ten dwellings within the vicinity of the Project can be accessed from Laheys Creek Road • No footpaths or parking.



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N

km
0 1 2

Legend

- Project Area
- Site access point
- State road
- Road
- Vehicular Track

FIGURE 6-18: KEY ROADS NEAR THE PROJECT

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Parking

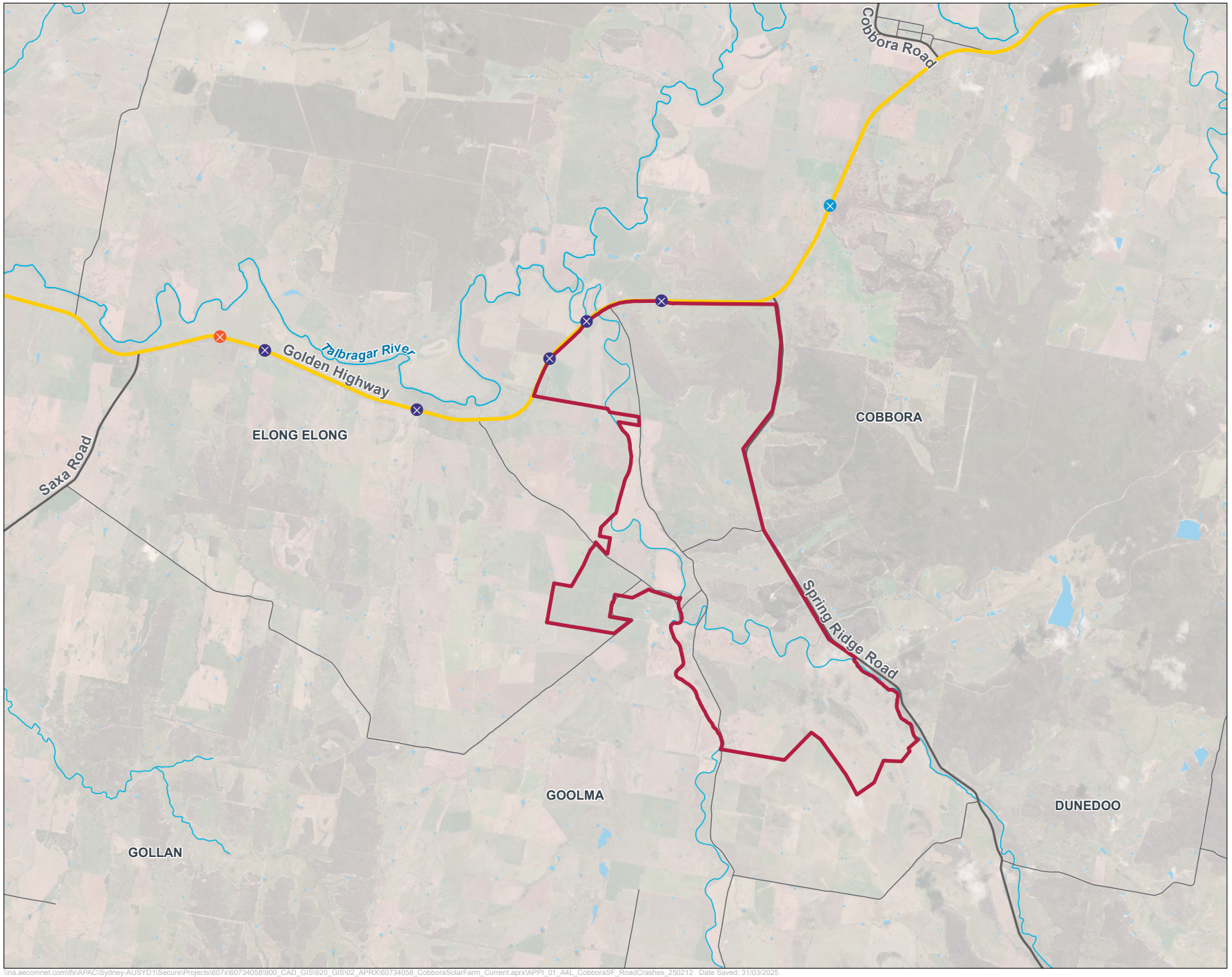
There are no formal parking facilities in the vicinity of the Project Area, either on-street or off-street.

Road safety

Transport for NSW provides interactive crash and casualty statistics by LGA (TfNSW, 2024). This data was reviewed to obtain a general understanding of crash statistics within 10 km of the Project Area. These statistics provided an overview of all crashes for the five-year period between 2019 and 2023. The location of these crashes is shown on **Figure 6-19**.

The review of the crash data indicates that seven crashes occurred within 10 km of the Project Area during the five-year period. All of these crashes occurred along the Golden Highway. The outcomes of these crashes are summarised below:

- One resulted in minor injury
- Four resulted in moderate injury
- One resulted in serious injury
- No casualties or fatalities were recorded.



AECOM

N

0 1 2 km

Legend

- Project Area
- Waterbody
- Watercourses
- State road
- Main road
- Local road

Severity of crash

- Minor/other injury
- Moderate injury
- Serious injury

FIGURE 6-19 ROAD CRASHES WITHIN 10 KILOMETRES OF THE PROJECT *TFNSW CRASH STATISTICS (ACCESSED 2024, MODIFIED BY AECOM)*

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Source: Earthstar Geographics

Public transport and coaches

There are limited public transport services in the vicinity of the Project Area due to the low population density and associated lack of demand. Though public transport services do run from nearby key towns, such as Dubbo and Dunedoo, only a limited number of coach services run along the section of Golden Highway to the north of the Project Area.

Coach services operate to link schools in Dubbo to the west with the townships of Elong Elong and Dunedoo to the east. The number of coach services operating during the AM and PM peak periods along the Golden Highway between Dubbo and Dunedoo are shown in **Table 6-53**.

Table 6-53 Regional school coach services linking Dubbo and Dunedoo

Direction	AM Weekday Peak (6:00 am – 9:00 am)	PM Weekday Peak (3:00 pm – 6:00 pm)
S137 – Dunedoo to Dubbo	1	-
S137 – Dubbo to Dunedoo	-	1

Outside of these school coaches, no other public coach or bus services operate along the Golden Highway near the Project Area. A rail line runs parallel to the Golden Highway (on the north side); however, no public rail services run between Dubbo, Elong Elong and Dunedoo.

Active transport

The Central West Cycling Trail (CWCT) is a 400 km loop through the Central West Region of New South Wales, connecting towns such as Mudgee, Gulgong, Dunedoo, Mendooran, Ballimore, Dubbo, Geurie, Wellington, and Goolma. The Dunedoo to Mendooran section, via Cobbora, is located near the Project Area. Spanning approximately 67 km, this section of the trail briefly overlaps the Golden Highway for about 700 m, 7 km north-east of the Project Area.

There are no formal walking or cycling facilities in the vicinity of the Project Area.

Traffic demand

The Project is located in a regional area, characterised by low traffic volumes. Analysis of collected traffic survey data at the Golden Highway / Spring Ridge Road intersection indicates that the AM peak hour occurs from 8:00 am to 9:00 am and the PM peak hour is between 4:15 pm to 5:15 pm. Traffic volumes at the intersection are low, with recorded peak hour volumes being less than 100 vehicles an hour in total.

Based on traffic surveys, the Golden Highway recorded an annual average daily traffic (AADT) of approximately 1,365 vehicles, while Spring Ridge Road had an AADT of approximately 50 vehicles in 2022. The traffic volumes along other rural roads surrounding the Project Area (Danabar Road, Sandy Creek Road, Sweeneys Lane and Tallawonga Road) are considered to be similar to, or less than, Spring Ridge Road.

6.8.4 Impact assessment

Construction

The construction phase of the Project will require movements by a variety of heavy and light vehicles. This will include delivery vehicles carrying components, parts, equipment and machinery, as well as light vehicles carrying workers, small parts and equipment.

Road network

During the peak construction period (likely to occur during late Q2 and early Q3 2028), it is expected that up to seven light vehicles and 44 heavy vehicles per day will be required to access the Project Area, and up to one oversize and over mass (OSOM) vehicle per day, as required. Shuttle buses will transport personnel from nearby airports to the Project Area on Monday mornings and return them on Friday afternoons of the same week. It is anticipated that up to 17 shuttles buses will be required. This equates to 14 light vehicles movements (two-way) and 88 heavy vehicle movements (two-way) per day, and 34 shuttle bus movements (two-way) per week.

Assessment of the traffic and transport impacts during the peak construction period indicate the following:

- For the Golden Highway:
  - the expected AADT on the Golden Highway in the future scenario in 2028 without construction is expected to be approximately 1,445 vehicles. The addition of approximately 30 construction traffic vehicles is expected during the peak construction vehicle traffic period (August 2028), which the Golden Highway has sufficient capacity to accommodate
  - the Golden Highway / Spring Ridge Road intersection has existing auxiliary turn lanes to handle the additional construction traffic expected during the peak construction vehicle traffic period and, as such, no intersection upgrades are required
  - widening of the intersection at the corners of the Golden Highway / Spring Ridge Road intersection will be required to facilitate turning movements of heavy construction vehicles; additionally, changes to line marking will be required.
- For Spring Ridge Road:
  - the expected AADT on Spring Ridge Road in the 2028 scenario without construction is expected to be approximately 55 vehicles. The addition of approximately 25 construction traffic vehicles is expected during the peak construction vehicle traffic period (August 2028), which Spring Ridge Road has sufficient capacity to accommodate
  - local widening of Spring Ridge Road at the Project Area access points will be required to facilitate turning movements of heavy construction vehicles into/out of the Project Area.
- Potential impacts may occur with OSOM vehicles such as vehicle collisions and acquiring approval from rail companies to cross raid bridges. However, these potential impacts will be addressed and therefore no significant impacts are expected along the proposed OSOM haulage route.

Pavement conditions are considered to be acceptable along the parts of the proposed haulage route using State roads.

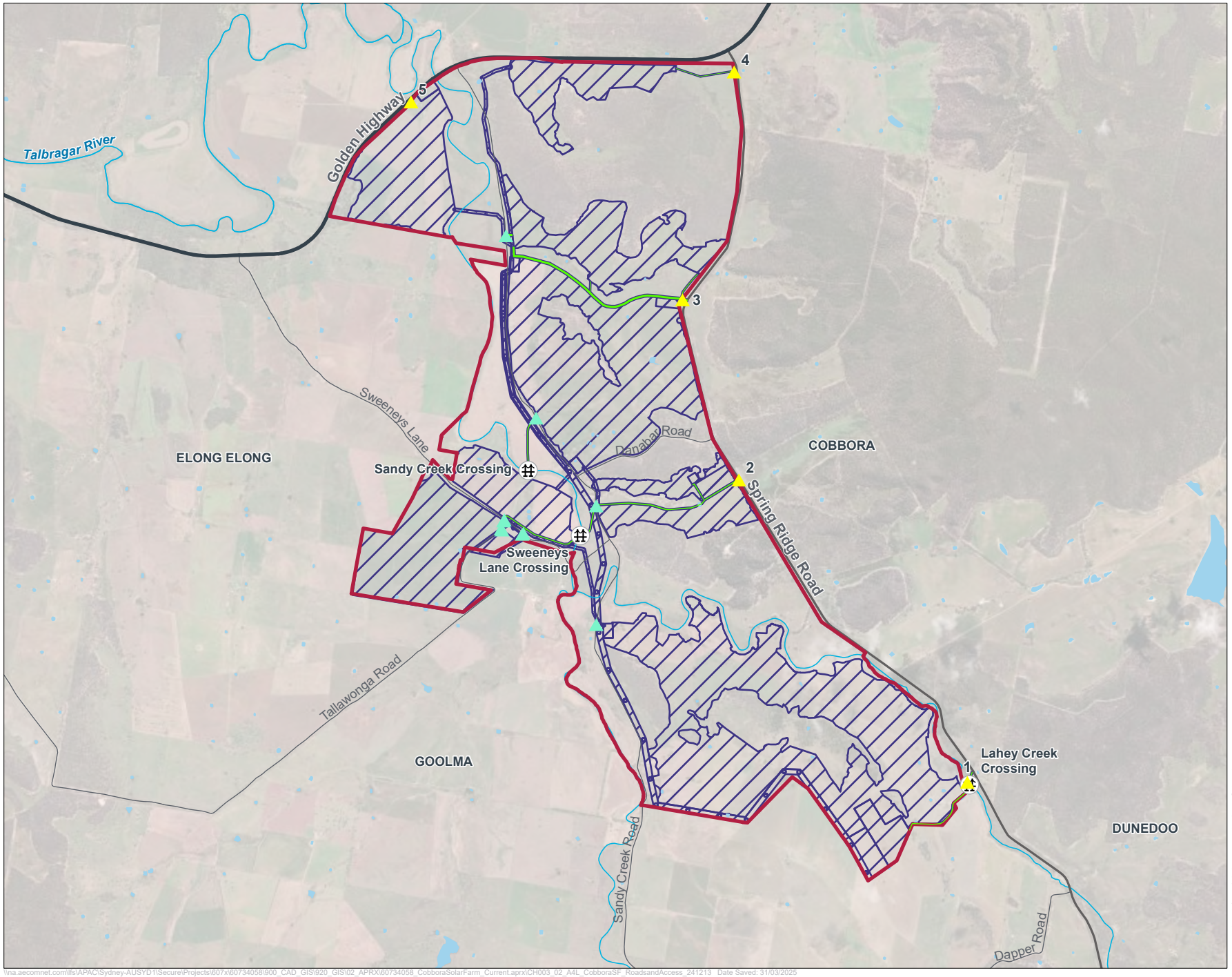
The pavement of Spring Ridge Road is expected to be suitable after upgrades associated with the Elong Elong Energy Hub project have been implemented. Sandy Creek Road, Danabar Road and Sweeneys Lane may need minor upgrades where Project access requires crossing of these roads.

Access and parking

Impacts to local property accesses both in and out of driveways along Spring Ridge Road are expected to be minimal due to the small number of properties on this road. It is expected that at most, up to two general traffic vehicles will feed into Spring Ridge Road from the Golden Highway during the peak hour. Primary and secondary access points are shown on **Figure 6-20**.

Partial or temporary road closures and traffic diversions may be required to facilitate improvements at the Golden Highway and Spring Ridge Road intersection and local widening of Spring Ridge Road at the Project Area access points. However, these are likely to be short-term and are not expected to result in any significant impacts to local access along Spring Ridge Road.

During construction, parking will be provided for up to 100 light vehicles and shuttle buses within the Development Footprint. No formal parking exists on public roads within the vicinity of the Project Area and, as such, no public parking impacts are expected.



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N

0 0.5 1 km

Legend

- Project Area
- Development Footprint
- Internal roads
- Waterbody
- Watercourses
- Motorway
- Main road
- Local road
- Primary access point
- Secondary access point
- Proposed bridge crossings

FIGURE 6-20: PROJECT LAYOUT AND ACCESS POINTS

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Source: Earthstar Geographics

Road safety

The movement of Project traffic into and out of the Golden Highway Access Point has the potential to pose safety risks due to interactions between slow-moving construction vehicles and fast-moving traffic. This will be mitigated by the implementation of a left in, left out only arrangement. Access via the Spring Ridge Road and Golden Highway intersection is expected to have a minimal impact on road safety given the low crash rate and availability of appropriate turning treatment. Given this, road safety impacts are expected to be minimal, noting the low population and low traffic movements in the vicinity of the Project Area.

Public transport, coaches, and active transport

Minimal impacts are expected on public transport or active transport facilities in the vicinity of the Project Area. No significant impacts are expected on the school coach line that operates along the Golden Highway between Dubbo and Dunedoo.

No other public bus or passenger rail services operate in the vicinity of the Project Area.

Operation

Road network

It is expected that 20 full time workers will be required during the operational phase. Assuming the worst-case scenario where 20 light vehicles will be required to transport the workers to and from the Site, 40 vehicle movements will occur daily.

The anticipated AADT for the Golden Highway is around 1,600 vehicles, while Spring Ridge Road is expected to have around 60 vehicles in the future base scenario for 2038. The expected AADT for the Golden Highway in the future scenario in 2038 with operation is expected to be approximately 1,640 vehicles (i.e. will fall within the category of ‘between 1,000 and 3,000 vehicles daily’). The expected AADT for Spring Ridge Road in the future scenario in 2038 with operation is expected to be approximately 100 vehicles (i.e. will fall within the category of ‘between 1 to 150 vehicles daily’). This falls within the same daily traffic volume category as the future base scenario in 2038 for both the Golden Highway and Spring Ridge Road. Operational traffic numbers are low and will not affect the overall capacity of the Golden Highway or Spring Ridge Road.

Similarly, turning movement volumes from the Golden Highway into Spring Ridge Road will be low and produce similar results as the future base scenario in 2038 The existing turning treatments will be adequate for the future scenario in 2038 with operation and, as such, no turning upgrades will be required at the Golden Highway / Spring Ridge Road intersection.

Access and parking

Operational access points will be identical to those used during the construction phase. No access impacts are expected given the low traffic volumes required during Project operations.

At least 30 permanent parking spaces will be required during the operational phase. Sufficient parking will be provided within the Development Footprint to account for the operational staffing needs of the Project plus any contractors or visitors to site. No formal parking exists on public roads within the vicinity of the Project Area and, as such, no parking impacts are expected.

Road safety

Given the low traffic volumes expected to be generated by the operation of the Project, it is expected that any adverse impacts on road safety arising from the Project will be minimal.

Public transport, coaches and active transport

No impacts to the CWCT along the Golden Highway or to public transport are expected given the low traffic volumes required to operate the Project.

Decommissioning

The decommissioning phase will likely occur after 35 years of operation. Background traffic growth rates associated with future development projects and land use changes in the area cannot be accurately determined at this stage, though it is anticipated that decommissioning of the Project will generate traffic volumes less than the volumes generated during the construction phase. The proposed

plan for the decommissioning phase is unknown at this stage; however, decommissioning activities will likely be undertaken in stages over a shorter timeframe than construction.

Given the lack of information, forecasting traffic movements to assess the decommissioning phase is not feasible at this stage. It is suggested that assessments be undertaken in subsequent stages once further details are available regarding decommissioning.

6.8.5 Management and mitigation measures

Road upgrades

Site access points where road upgrades are required are summarised in **Table 6-54** and show on **Figure 6-20**.

Table 6-54 Indicative schedule of road upgrades to be completed by the Project

Location	Type of upgrade	Timing
Spring Ridge Road, at Site Access Road (Access 1)	• Local widening of Spring Ridge Road to facilitate turning movements of heavy construction vehicles	Construction phase
Spring Ridge Road, at Site Access Road (Access 2)	• Local widening of Spring Ridge Road to facilitate turning movements of heavy construction vehicles	Construction phase
Spring Ridge Road, at Site Access Road (Access 3)	• Local widening of Spring Ridge Road to facilitate turning movements of heavy construction vehicles	Construction phase
Spring Ridge Road, at Site Access Road (Access 4)	• Local widening of Spring Ridge Road to facilitate turning movements of heavy construction vehicles	Construction phase
Golden Highway, at Site Access Road (Access 5)	• Construction of left-in, left-out and right-out turning movements, configuration to facilitate turning movements of heavy construction vehicles	Construction phase
Golden Highway / Spring Ridge Road intersection (to be completed by EnergyCo)	• Widening of corners to facilitate turning movements of heavy construction vehicles • Line marking changes to facilitate safe movement of construction heavy vehicles	Prior to construction phase
Spring Ridge Road	• Pavement upgrades suitable for construction heavy vehicle movements	Prior to construction phase

This section describes the environmental management approach for traffic, transport and access during construction and decommissioning of the Project. The assessments have demonstrated that operational impacts are minimal and as such mitigation measures for that phase are not warranted.

Table 6-55 Management and mitigation measures – traffic and transport

ID	Management and mitigation measure	Timing
T1	A Construction Traffic Management Plan (CTMP) will be prepared as a sub plan to the CEMP, and in consultation with Warrumbungle Shire Council, Dubbo Regional Council and Transport for NSW. The CTMP will include a Drivers Code of Conduct and will be designed to minimise the impact of Project construction traffic (including OSOM vehicles) on the external road network.	Detailed design and Construction
T2	A Traffic Management Plan will be prepared, as required, prior to large-scale maintenance activities with the potential to impact traffic.	Operation

ID	Management and mitigation measure	Timing
T3	Where required, Project accesses will be upgraded to a Typical Rural Property Access standard in consultation with Transport for NSW, Warrumbungle Shire Council and Dubbo Regional Council.	Detailed design and Construction
T4	Vehicle access to and from the Development Footprint will be via the designated access points (unless agreed with the relevant road authority). Access points will be designed and managed to minimise safety risks to motorists and other road users.	Construction
T5	All trucks will enter and exit the Development Footprint in a forward direction. Provision will be made within the Development Footprint to allow vehicles to turn around without the need for reversing.	Detailed design and Construction
T6	Appropriate signage, line marking and/or traffic control measures will be used near access points to direct and guide motorists past the Project Area, if required.	Detailed design and Construction
T7	Sufficient designated parking will be provided within the Development Footprint for all construction vehicles (light and heavy vehicles), and no parking or storing of materials will occur on the public road network in the vicinity of the Project Area.	Construction
T8	A maximum speed limit of 20 km/h will be enforced throughout the Development Footprint.	Construction
T9	An independent dilapidation survey will be undertaken to assess the condition of the pavement and drainage and bridge structures along the proposed construction route(s) (between the Golden Highway/Spring Ridge Road intersection and site access points) prior to and following construction or decommissioning activities.	Construction
T10	Over-dimensional vehicles will only travel to the Project once an Over Size Over Mass (OSOM) Permit from the National Heavy Vehicle Regulator and any required approvals/permits from the relevant road authorities have been obtained.	Construction
T11	A Traffic Management Plan specific to the decommissioning phase will be prepared prior to decommissioning which reflects changes in background traffic volumes and work procedures, and in consultation with Warrumbungle Shire Council, Dubbo Regional Council and Transport for NSW.	Decommissioning
T12	The Central West Cycling Trail (CWCT) route will be highlighted within the site induction and driver's code of conduct to increase awareness of cyclists' presence in the area. Drivers will be instructed to respect the safety of cyclists using local and regional roads, including complying with legal passing separation distances.	Construction

6.9 Flooding

6.9.1 Secretary's Environmental Assessment Requirements

Table 6-56 sets out the SEARs relevant to flooding and where the requirements have been addressed in this EIS.

Table 6-56 SEARs – Flooding

Relevant SEARs	
Flooding	**Where addressed**
The EIS must address the following specific matters: • an assessment of the likely impacts of the development (including flooding and flood modelling, if required) on surface water and groundwater resources (including Sandy	Potential impacts associated with flooding are discussed in **Section 6.9.4** including impacts

Relevant SEARs	
Creek and Laheys Creek traversing the site and surrounding watercourses, drainage channels, wetlands, riparian land, farm dams, groundwater dependent ecosystems and acid sulfate soils), related infrastructure, adjacent licensed water users and basic landholder rights, and measures proposed to monitor, reduce and mitigate these impacts having regard to the Solar Guideline	to watercourses, drainage channels and farm dams. Other potential impacts to surface water and groundwater are assessed in **Section 6.10.4**
• assessing the impacts of the development, including any changes to flood risk and overland flows on-site or off-site, and detail design solutions and operational procedures to mitigate flood risk where required	Potential impacts are discussed in **Section 6.9.4.** This includes a discussion of preliminary design solutions to mitigate flood risk. Mitigation and management measures are provided in **Section 6.9.5**
• Flood Risk: identification of any flood risk on site having regard to adopted flood studies, the potential effects of climate change and any relevant provisions of the NSW Flood Risk Management Manual; - where the development could alter flood behaviour, affect flood risk to the existing community or expose its users to flood risk, provide a flood impact and risk assessment (FIRA) prepared in accordance with the Flood Impact and Risk Assessment – Flood Risk Management Guide LU01; - detailed design solutions and operational procedures to mitigate flood risk where required.	The Flood Impact Assessment was undertaken in accordance with the Flood Impact and Risk Assessment – Flood Risk Management Guide LU01. This chapter includes a discussion of preliminary design solutions to mitigate flood risk. Detailed solutions will be developed during detailed design. Mitigation and management measures are provided in **Section 6.9.5**

6.9.2 Methodology

A Flood Impact Assessment report was prepared to assess potential flooding impacts associated with the construction and operation of the Project. This is attached as **Appendix O (Flood Impact Assessment)**.

The Flood Impact Assessment was undertaken in accordance with the Flood Impact and Risk Assessment – Flood Risk Management Guide LU01 (DPE, 2023a). The specific methodology of this flood assessment was developed according to the general principles described in Australian Rainfall and Runoff (Geoscience Australia, 2019).

Flood modelling was undertaken for 20% and 1% annual exceedance probability (AEP) events, with model results post-processed to produce maximum results across different rainfall event durations. Flood modelling involved the development of:

- A baseline hydrological model using the RORB routing program which estimates the volume and timing of water entering the catchment through the natural hydrological cycle (e.g. rainfall, runoff) under existing conditions
- A baseline hydraulic model in TUFLOW which simulates how water behaves within a subset of the catchment (referred to as the ‘domain’), including flood extents, velocities, and depths under existing conditions
- Post-development hydrological and hydraulic models which incorporate Project infrastructure and accounts for changes to ground permeability, landform and vegetation resulting from the Project.

Rainfall sensitivity scenarios (±10%) were incorporated into the models to account for uncertainty in the hydrological flow rates due to the potential of climate change impacts upon rainfall intensity.

Two post-development scenarios were considered to account for the two bridge options proposed for the Project’s creek crossings (steel kit or pre-cast concrete). These were considered for crossings

proposed at Sandy Creek Crossing, Lahey Creek Crossing, and Sweeneys Lane as shown on **Figure 6-21**.

The post-development models were compared with the baseline models to assess changes in normal water flow, flood extents, velocities, and depths, allowing for the identification and evaluation of potential flooding impacts caused by the Project. The catchment, streampaths and model domain relevant to the Project area are shown on **Figure 6-22**.

6.9.3 Existing environment

Catchments and waterways

The Project Area is located within the Macquarie-Bogan River Catchment, a catchment in the central-west of NSW that spans an area of 74,800 km^2. The major tributaries of the upper Macquarie catchment are the Cudgegong, Talbragar, and Little and Bell Rivers. The Talbragar River rises on the south slopes of the Great Dividing Range and flows generally in a south-west direction before reaching its confluence with the Macquarie River near Dubbo. The Talbragar River flows to the north of the Project Area about 600 m at its closest point.

Several tributaries of the Talbragar River flow through the Project Area, including Sandy Creek and Laheys Creek which are both perennial creeks. From the NSW Hydrology Map on the SEED Portal (NSW Government, 2024b), Laheys Creek is classed as fourth order stream, whilst Sandy Creek is classed as fifth order stream. These creek systems exhibit concentrated flows, with inundation of adjacent floodplains occurring in response to rarer rainfall events. A significant amount of floodplain storage is associated with these creek systems, with attenuation of flows occurring in the floodplain storage within the Project Area.

Sandy Creek extends over 11 km through the Project Area in a north-south direction before connecting with the Talbragar River about 1 km north of the Project Area. Multiple unnamed first, second and third order tributaries of Sandy Creek also flow across the Project Area.

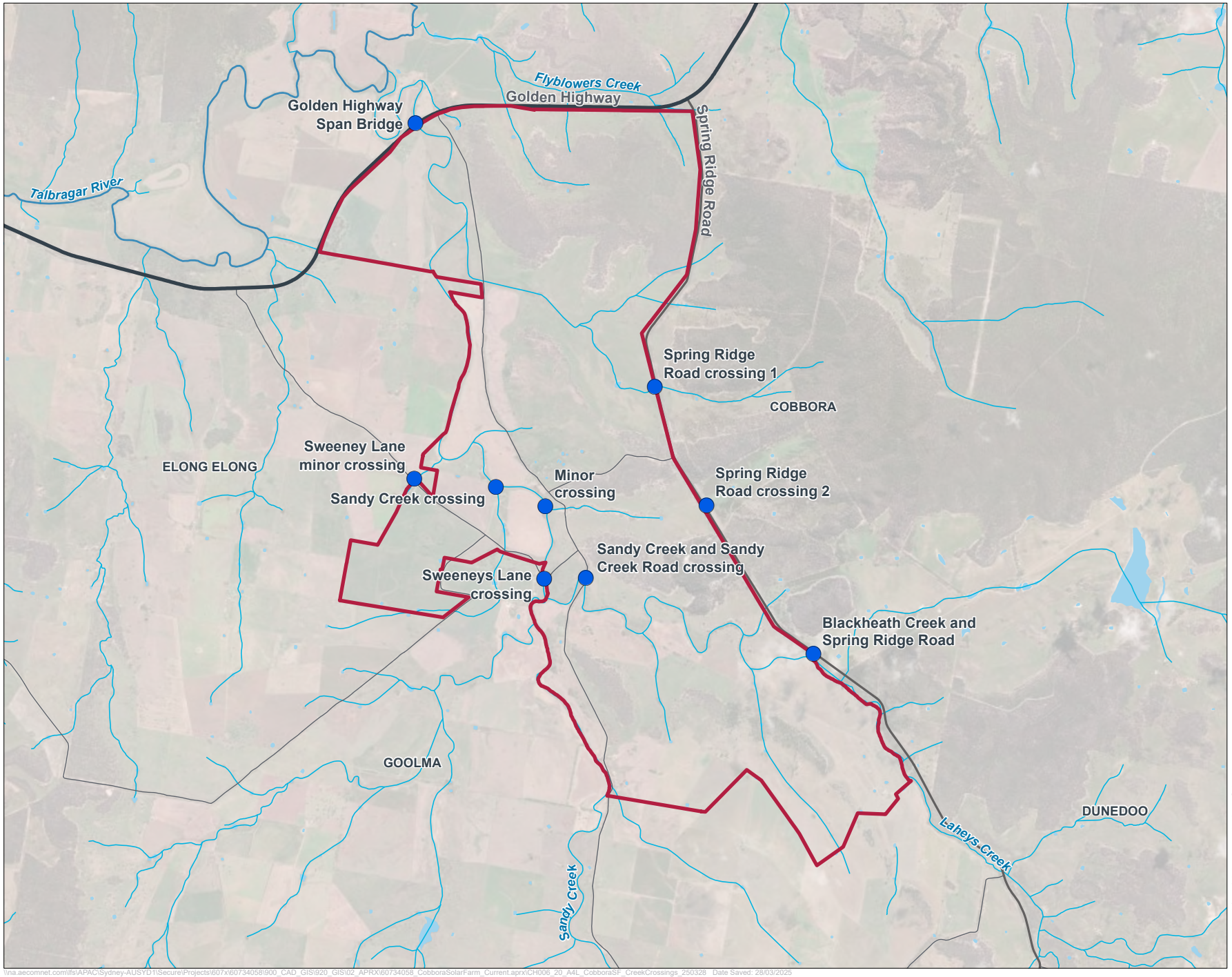
Approximately 8 km of Laheys Creek passes through the Project Area before connecting with Sandy Creek. Three unnamed first order tributaries of Laheys Creek also flow across the Project Area.

The above waterways are shown on **Figure 6-23**.

The Project Area contains around 45 perennial farm dams constructed by landowners.

Existing creek crossings within and adjacent to the Project Area are shown on **Figure 6-21** and include:

- Golden Highway – Sandy Creek crossing: a 60 m wide span bridge, comprised of 6 individual segments
- Minor rural road and access ways that traverse the beds of Sandy Creek and Laheys Creek.



AECOM

N

0 1 2 km

Legend

- Project Area
- Waterbody
- Motorway
- Main road
- Local road
- Watercourses
- Drainage lines
- Creek crossings

FIGURE 6-21: EXISTING CROSSINGS WITHIN THE PROJECT AREA

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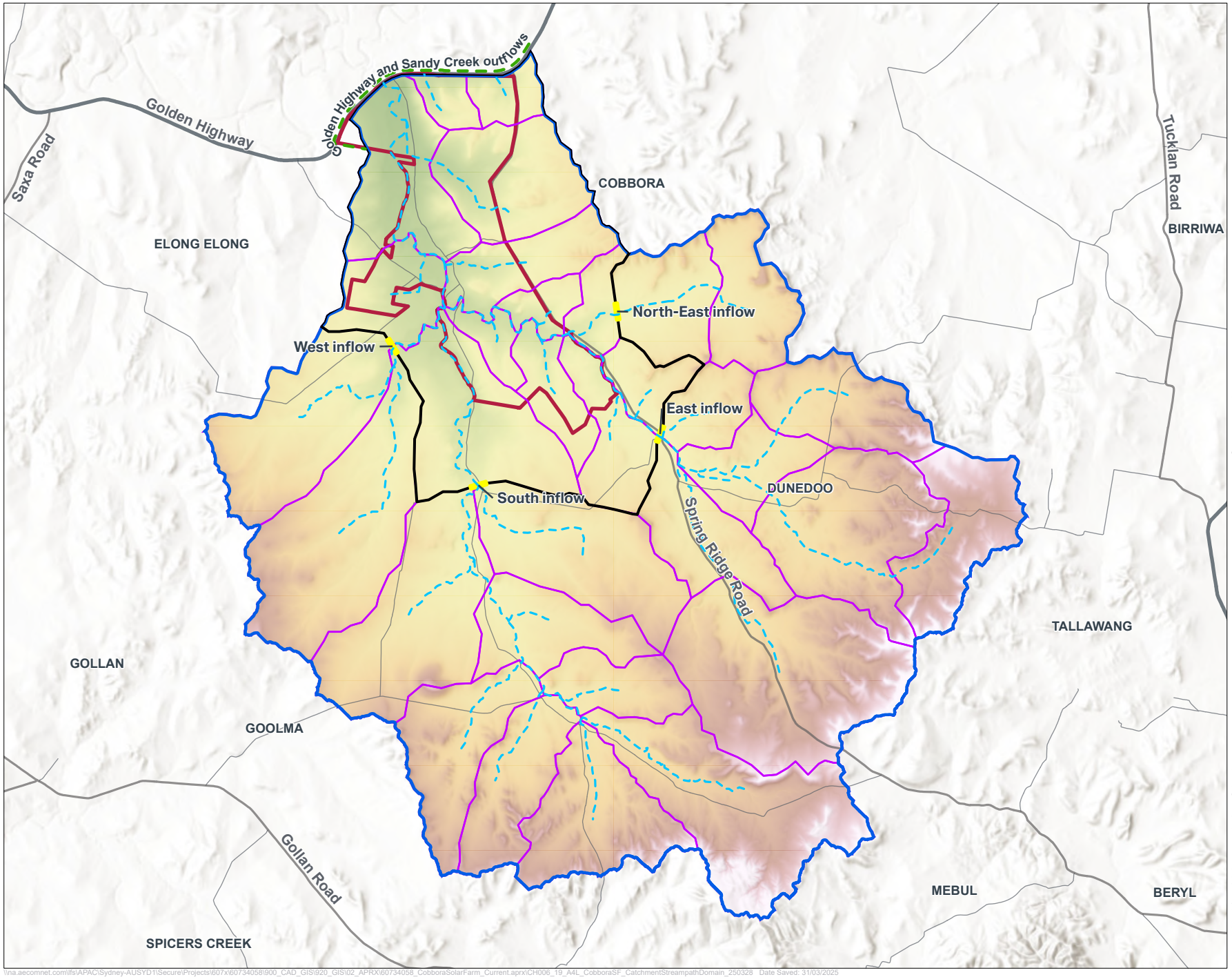
Source: Earthstar Geographics



AECOM

N

0 1 2 km

Legend

- Project Area
- Inflow boundary condition
- Hydraulic model domain
- Total catchment area
- Hydrological sub-catchments
- Motorway
- Main road
- Local road
- Outflow boundary condition
- Delineated streampaths

Terrain elevation (m)

660

320

FIGURE 6-22: CATCHMENT, STREAM PATH AND DOMAIN

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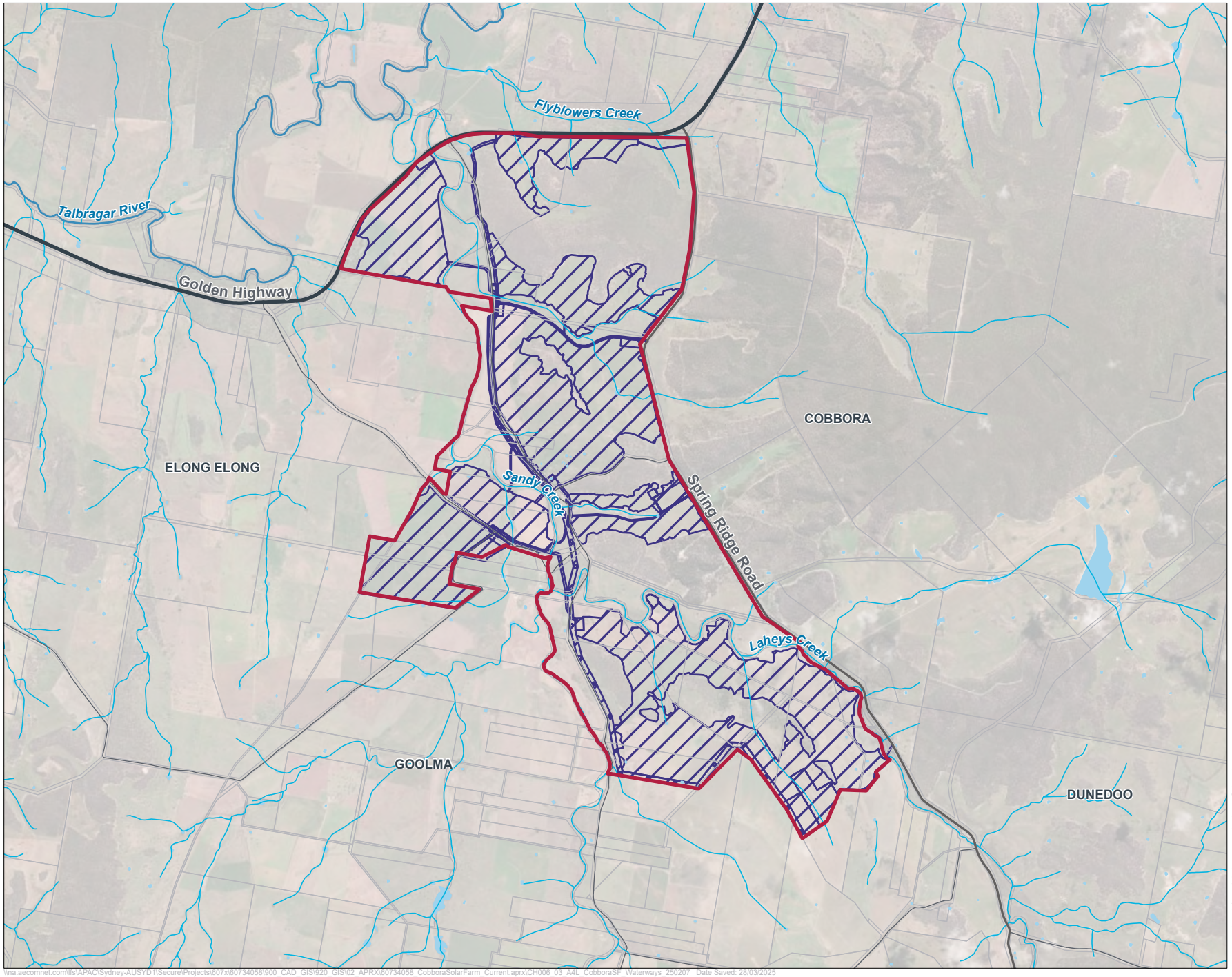
Source: Esri, Geoscience Australia, NASA, NGA, USGS



AECOM

N

0 1 2 km

Legend

- Project Area
- Development Footprint
- Cadastral boundary
- Waterbody
- Watercourses
- Drainage lines
- Motorway
- Main road
- Local road

FIGURE 6-23: WATERWAYS

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Source: Earthstar Geographics

Baseline modelling results

The baseline modelling results indicate that, under existing conditions, the Project Area is subject to the following general flood responses:

- The upper catchments of Sandy Creek and Laheys Creek are subject to generally shallow, distributed flow paths. The flows in these areas are generally low (<0.1 m) and exhibit low velocity. Erosion and scour are not expected as a result of the overland flow conditions
- Laheys Creek and the upper reaches of Sandy Creek are subject to moderate flow depths (generally less than 3 m), with modelled flows inundating the adjacent floodplains. Refer to **Table 6-57** for the approximate inundated floodplain widths during the various AEP events.
- The lower reaches of Sandy Creek, where the waterway approaches the Golden Highway, are subject to wider floodplain responses compared to the upper region of the creek, with deeper ponding of water evident. Similarly, refer to **Table 6-57** for the approximate inundated floodplain widths during the various AEP events.
- The Golden Highway Sandy Creek bridge crossing forms a hydraulic boundary and contributes to the ponding depths to the south i.e. upstream of the Golden Highway within the Project Area. **Table 6-57** includes the approximate water depths.

A summary of baseline flood results at four locations is provided in **Table 6-57**.

Table 6-57 Baseline flood results

Location	Annual Exceedance Probability (AEP)	
	20%	1%
Golden Highway – Sandy Creek Crossing	Flood depths of 3 m. Flow is contained to the crossing. Adjacent upstream floodplains are modelled to experience mild inundation.	Flood depths of 4.5 m. Flow is generally contained to the crossing. Adjacent upstream floodplains are modelled to inundate.
Lower Reaches - Sandy Creek	Flood depths of 3.2 m. Minor inundation of adjacent floodplains. Floodplain is approximately 400 m wide (on average)	Flood depths of 4 m. Moderate inundation of adjacent floodplains. Flows exhibit erosive intensities. Floodplain is approximately 475 m wide (on average)
Laheys Creek	Flood depths of 2.5 m. Minor inundation of adjacent floodplain. Floodplain is approximately 200 m wide (on average).	Flood depths of 3 m. Moderate inundation of adjacent floodplain. Floodplain is approximately 300 m wide (on average)
Overland Flow Areas	Flood depths of 0.05 m. Minor overland flow depths. Generally not sufficient to comprise erosive flow.	Flood depths of 0.1 m. Moderate overland flow depths. Generally not sufficient to comprise erosive flow.
Accommodation camp	Flood depths of 0.23 m. The majority of the footprint is dry or has very shallow flow depths.	The majority of the footprint experiences overland flow less than 0.035 m in depth, with the south-western corner of the camp footppint modelled to experience depths up to 0.32m.

6.9.4 Impact assessment

Construction

The construction of the Project has the potential to result in hydrological and hydraulic changes. These changes are associated with:

- Minor changes in imperviousness in areas where laydown areas, the accommodation camp, helicopter landing site (emergencies only) and parking facilities are established
- Minor changes in ground surface formation as solar arrays are progressively constructed
- Changes in imperviousness as the BESS and substations are progressively constructed on hardstands
- Works in waterways to facilitate construction of bridge structures at three locations
- Altered flow paths associated with earthworks activities for site levelling and/or soil compaction
- Potential culvert and drainage blockages if material enters waterways.

These hydrological and hydraulic changes have the potential to result in minor alterations to flooding behaviour in and around the Project Area. Given this, the overall impact on flooding during construction is expected to be minor and temporary.

There is the potential for erosion associated with changed flow conditions, and disturbance of soils and vegetation, during construction. Impacts to surface water and groundwater during construction are discussed in **Section 6.10**. Erosion and sedimentation impacts will be managed according to the measures outlined in **Section 6.10.5**.

In the event of a flood event during construction, there is also the potential for inundation of site compounds, construction equipment, stockpiles and storage areas. These areas, including the accommodation camp are affected by overland flowpath flooding only. These facilities will be placed giving consideration to overland flow paths and mainstream flood risk. The risk to construction infrastructure from flooding is considered low.

Operation

The operation of the Project has the potential to result in hydrological and hydraulic changes. These changes are associated with the presence of Project infrastructure including:

- impervious solar panels
- impervious hardstands for the BESS and substations
- new bridge structures at three locations
- internal roads, constructed at grade
- power poles.

Table 6-58 outlines the results of the post-development flood models compared to the baseline models across the floodplain and at four creek crossings.

Table 6-58 Post-development model results

Location	Modelled results
Floodplains and catchment	In the floodplain and surrounding areas, the model shows that flood depths slightly decrease in the locations planned for solar panel arrays and internal roads. These areas also experience little to no change in water velocity.
Golden Highway	A negligible difference was observed between baseline and post-development scenarios (20%, and1% AEP events) at the existing Golden Highway Sandy Creek crossing. The modelled flood depth is below the assumed bridge obvert level (i.e. the maximum height at which water can pass beneath the bridge without overtopping the structure).

Location	Modelled results
	Slight increases in water levels (less than 3 mm) for the post-development scenarios will not impact the Golden Highway structure.
Sandy Creek Crossing	The creek does not have sufficient capacity to contain the two modelled AEP events during the baseline case (i.e. without the proposed crossing structure). These conditions have been modelled to persist during operation with flood depths upstream of the bridge increasing by up to 100 mm during a 1% AEP event post-development. The modelling showed a slight reduction in the depth across the upstream floodplain (approximately 15 mm) during a 1% AEP event post-development. The proposed bridge structure will be overtopped during the simulated AEP events for the post-development scenarios, at depths of up to 1.65 m in a 1% AEP event. Velocity increases through the structure, by approximately 1.5 m/s, are also likely.
Lahey Creek Crossing	The creek does not have sufficient capacity to contain the two modelled AEP events during the baseline case (i.e. without the proposed crossing structure). These conditions have been modelled to persist during operation with flood depths upstream of the bridge increasing by up to 85 mm during a 1% AEP event post-development. The proposed bridge structure will be overtopped during all three simulated AEP events for the post-development scenarios, at depths of up to 1.6 m in a 1% AEP event. Velocity increases, by approximately 1.05 m/s, through the structure are also likely.
Sweeneys Lane Crossing (Sandy Creek)	The creek does not have sufficient capacity to contain the two modelled AEP events during the baseline case (i.e. without the proposed crossing structure). These conditions have been modelled to persist during operation with flood depths upstream of the bridge increasing by up to 100 mm during a 1% AEP event post-development. The proposed bridge structure will be overtopped during simulated AEP events for the post-development scenarios, at depths of up to 2.6 m in a 1% AEP event. Velocity increases, by approximately 0.45 m/s, through the structure are also likely. Due to Sandy Creek being narrower at this location, the overtopping depths across the bridge structure are more than those observed at the other Sandy Creek crossing further downstream.
BESS	The post-development model results indicate a reduction in the overland flow water level across most of the BESS footprint of approximately 15 mm during a 1% AEP event, compared to the baseline scenario, with a maximum depth of flow off approximately 0.28m. Velocity increases, by approximately 0.13 m/s, are likely during a 1% AEP event.
Main substation	The post-development model results indicate a reduction in the overland flow water level across most of the substation footprint of approximately 15 mm during a 1% AEP event, compared to the baseline scenario, with a maximum depth of flow off approximately 0.24m. Velocity increases, by approximately 0.27 m/s, are likely during a 1% AEP event.
Accommodation camp	The post-development model results indicate a reduction in the overland flow water level across most of the accommodation camp footprint of approximately 5 mm during a 1% AEP event, compared to the baseline scenario, with a maximum depth of flow off approximately 0.30m. Velocity increases, by approximately 0.05 m/s, are likely during a 1% AEP event.

Overall, the change in flooding conditions is considered minor, relative to the baseline condition and potential impacts under the operational development case is expected to be low.

Erosion and sedimentation issues will be managed according to the measures outlined in **Section 6.10.5**.

6.9.5 Management and mitigation measures

Management and mitigation measures that will be implemented for the Project to address flooding are listed in **Table 6-59**. Emergency response measures, in the event of a flood, will be incorporated into the Construction and Operation Environmental Management Plans, refer to **Appendix E (Compilation of Mitigation Measures)**, measures G1 and G2.

Table 6-59 Management and mitigation measures - Flooding

ID	Management and mitigation measure	Timing
F1	Site planning during detailed design will: • Adopt appropriate placement of temporary works, plant, materials and workforce facilities, giving due consideration to overland flow paths and mainstream flood risk • Ensure that temporary works minimise offsite flooding impacts as far as practical.	Detailed design
F2	Waterway crossings will be designed and constructed to: • Consider the appropriate level of serviceability and flood immunity required for the Project • Consider local hydraulic conditions and minimise scour potential • Minimise local flooding impacts • Be consistent with all relevant guidelines including the *Guidelines for watercourse crossings on waterfront land* (DPE 2022) and *Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway* Crossings (Fairfull, S. and Witheridge, G. 2003)	Detailed design and Construction

6.10 Surface water, groundwater and water use

6.10.1 Secretary's Environmental Assessment Requirements

Table 6-60 sets out the SEARs relevant to surface water, groundwater and water use and where the requirements have been addressed in this EIS.

Table 6-60 SEARs – Surface water, groundwater and water use

Relevant SEARs	
Water	**Where addressed**
The EIS must address the following specific matters: • an assessment of the likely impacts of the development (including flooding and flood modelling, if required) on surface water and groundwater resources (including Sandy Creek and Laheys Creek traversing the site and surrounding watercourses, drainage channels, wetlands, riparian land, farm dams, groundwater dependent ecosystems and acid sulfate soils), related infrastructure, adjacent licensed water users and basic landholder rights, and measures proposed to monitor, reduce and mitigate these impacts having regard to the Solar Guideline;	• Potential impacts to surface water and groundwater are assessed in **Section 6.10.4** • Appropriate management and mitigation measures are provided in **Section 6.10.5** • Discussion of the flooding assessment, which included flood modelling, is provided in **Section 6.9**
• a site water balance for the development;	• An initial estimate of water demands and current

Relevant SEARs	
	availability for the Project is provided in **Section 6.10.4** • A site water balance will be undertaken for the Project during detailed design
• details of water requirements and supply arrangements for construction, operation and decommissioning, including licensing requirements and consultation with suppliers;	• Water requirements and supply arrangements are discussed in **Section 6.10.4**
• assessing the impacts of the development, including any changes to flood risk and overland flows on-site or off-site, and detail design solutions and operational procedures to mitigate flood risk where required;	• Flood risk impacts are discussed in **Section 6.9**
• where the project involves works within 40 metres of any river, lake or wetland (collectively waterfront land), identify likely impacts to the waterfront land, and how the activities are to be designed and implemented in accordance with the DPI *Guidelines for Controlled Activities on Waterfront Land* (2018) and (if necessary) *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings* (DPI 2003); and *Policy & Guidelines for Fish Habitat Conservation & Management* (DPI, 2013); and	• Potential impacts to waterfront land are assessed in **Section 6.10.4** and relevant management measures are provided in **Section 6.10.5**
• a description of the erosion and sediment control measures that will be implemented to mitigate any impacts in accordance with *Managing Urban Stormwater: Soils & Construction* (Landcom 2004) and *Managing Urban Stormwater: Soils and construction – Volume 2A manual* (Landcom 2008);	• A preliminary Erosion and Sediment Control Plan is provided in **Section 6.10.5**
• Flood Risk: identification of any flood risk on site having regard to adopted flood studies, the potential effects of climate change and any relevant provisions of the NSW Flood Risk Management Manual; - where the development could alter flood behaviour, affect flood risk to the existing community or expose its users to flood risk, provide a flood impact and risk assessment (FIRA) prepared in accordance with the Flood Impact and Risk Assessment – Flood Risk Management Guide LU01; - detailed design solutions and operational procedures to mitigate flood risk where required.	• Discussion of the flooding assessment, which included flood modelling, is provided in **Section 6.9**

6.10.2 Methodology

The surface water environment, groundwater conditions and water use within the Project Area were determined and assessed through a review of available online databases, mapping and specific studies completed for the Project or nearby surrounding projects. The primary sources of data for this assessment were the following resources and reports:

- Environmental layers from the Sharing and Enabling Environmental Data (SEED) Portal (NSW Government, 2024b):
  - Hydrology Map
  - State Vegetation Type Map
  - Groundwater Dependent Ecosystems Map
  - Acid sulfate soils Map.

- Groundwater information products from the Bureau of Meteorology (BOM, 2025):
  - Australian Groundwater Explorer
  - Groundwater Dependent Ecosystems Atlas
- Wambuul / Macquarie-Castlereagh valley annual surface water quality report: 2022-2023 (DCCEEW, 2024b)
- Water Quality Objectives for NSW waterways (NSW Government, 2006)
- Cobbora Coal Project Groundwater Assessment (Parsons Brinckerhoff Pty Limited, 2012)
- Technical specialist assessments prepared for this EIS and attached as:
  - **Appendix G (Biodiversity Development Assessment Report)**
  - **Appendix N (Bushfire Threat Assessment)**
  - **Appendix O (Flood Impact Assessment)**.

6.10.3 Existing environment

Catchments and waterways

Waterways within and surrounding the Project Area are described in **Section 6.9.3**.

Water quality

The Project Area is located within the Macquarie Castlereagh water resource plan area (WRPA). Land use in the Macquarie Castlereagh WRPA is largely grazing in the upper and lower catchment with increased levels of cropping through the mid-catchment downstream of Dubbo.

The Wambuul / Macquarie-Castlereagh valley annual surface water quality report: 2022-2023 (DCCEEW, 2024b) provides an overview of the water quality conditions using monthly data collated from July 2021 to June 2022 within the Macquarie Castlereagh WRPA. One of the monitoring locations used in the report is an existing water quality station located along the Talbragar River at Elong Elong, about 14 km northwest (downstream) of the Project Area. This is the closest monitoring station to the Project Area. Results from this report have been compared with trigger values associated with NSW Water Quality Objectives (WQOs) in **Table 6-2**.

WQOs represent the long-term goals for NSW's surface waters, and are consistent with the national framework for assessing water quality as set out in the ANZECC 2000 Guidelines. Based on the likely construction activities and operations related to the Project, the WQOs presented in **Table 6-2** are considered relevant to the Project. The trigger values are derived from the Australian and New Zealand Water Quality guidelines for fresh and marine water quality, in particular Table 3.3.2 and Table 3.3.3.

Table 6-61 Water quality objectives relevant to the Project

Indicator	Units	Trigger values	Approximate median value[1]
Total phosphorus	µg/L	20	350
Total nitrogen	µg/L	250	1000
Turbidity	NTU	2 to 25	100
Salinity (electrical conductivity)	µS/cm	30 to 350	1350
Dissolved oxygen	%	90 to 110	87.5
pH	-	6.5 to 8.0	8.25
Visual clarity and colour	-	Natural visual clarity should not be reduced by more than 20%. Natural hue of the water should not be changed by more than 10 points on the Munsell Scale.	Not included in annual report

Indicator	Units	Trigger values	Approximate median value[1]
		The natural reflectance of the water should not be changed by more than 50%.	
Surface films and debris	-	Oils and petrochemicals should not be noticeable as a visible film on the water, nor should they be detectable by odour. Waters should be free from floating debris and litter.	Not included in annual report

[1] Wambuul / Macquarie-Castlereagh valley annual surface water quality report: 2022-2023 (DCCEEW, 2024b)

The monitoring results indicate that there is a general trend of increasing turbidity and nutrient concentrations down the catchment, reflecting the impact of the cumulative effects of land use, soil disturbance and human activity on water quality (DCCEEW, 2024b). In the 2022 to 2023 report the highest turbidity (around 100 NTU) and total phosphorus (350 µg/L) results were in the Talbragar River at Elong Elong and one other location. The Talbragar River was also one of three rivers which shared the highest median electrical conductivity (around 1,250 uS/cm) among all 15 monitoring sites. This result is likely caused by localised areas of high salinity in the unregulated catchments (DCCEEW, 2024b).

NSW uses a Water Quality Index (WaQI) as a tool to communicate complex and technical water quality data in a simple and consistent way (DCCEEW, 2024b). The WaQI for the monitoring location along the Talbragar River at Elong Elong returned a score of 42 (poor), representing a highly degraded site (with all scores at this monitoring location being below 50 since 2012–2013). Of the 15 monitoring locations across the Wambuul / Macquarie-Castlereagh WRPA, the location along the Talbragar River at Elong Elong represented the lowest result.

The NSW Acid Sulfate Soils Map on the SEED Portal (NSW Government, 2024b) indicates no presence of acid sulfate soils within the Project Area (discussed further in **Section 6.5**).

Riparian land

The NSW State Vegetation Type Map (NSW Government, 2024b) maps the bank of Sandy Creek as:

- PCT 78: River red gum riparian tall woodland/open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion.

The banks of Laheys Creek and the aforementioned unnamed waterways within the Project Area are occupied by:

- PCT 202: Fuzzy box woodland on colluvium and alluvial flats
- PCT 281: Rough-barked apple and red gum yellow box woodland on alluvial clay to loam soils.

There are a number of existing uncontrolled creek crossings within the Project Area. **Plate 6-1** and **Plate 6-2** show two of the existing crossings along Sandy and Laheys Creek.

Plate 6-1 Existing Sandy Creek crossing

Plate 6-2 Existing Laheys Creek and Sandy Creek Road crossing

Groundwater

The Project Area is located within both the NSW Murray-Darling Basin Fractured Rock and NSW Murray-Darling Basin Porous Rock Water Resource Plan.

The Dubbo Second Edition 1:250,000 Geological Map depicts that the Project Area is overlain by (NSW Government, 2024a):

- Quaternary alluvial deposits (Qa) comprising mud, silt, sand and gravel deposited from the upstream river system
- Triassic sedimentary rocks (Rs) comprising quartz-rich sandstone, mudstone and siltstone, also deposited from the upstream river system
- Permian sedimentary rocks (Ps) comprising sandstone, siltstone and mudstone deposited in fluvial and floodplain systems.

The quaternary alluvial deposits and Triassic and Permian sedimentary rocks form part of the Gunnedah-Oxley Basin water source. The quaternary alluvial deposits form an unconfined aquifer that is recharged via direct rainfall infiltration and stream seepage during floods. The primary discharge from this aquifer is associated with leakage to deeper aquifers. This alluvium is limited to being along Sandy Creek. The Triassic and Permian sedimentary rocks form a porous rock aquifer which underlies the majority of the Project Area, exhibiting a porous composition that facilitates the groundwater recharge. Groundwater discharge from these sedimentary formations occurs via aquifer outcrops. Connectivity between the porous rock units is generally by confining or semi-confining units comprising shale, claystone, siltstone or other lower permeable materials (Parsons Brinckerhoff Pty Limited, 2012). There Is potential for leakage between confining layers, especially in highly fractured areas near faults and in area where the confining layers have low clay content (Parsons Brinckerhoff Pty Limited, 2012).

A fractured rock groundwater system underlies and surrounds the Triassic and Permian porous rock aquifer. This system is associated with the Lachlan Fold Belt. The Lachlan Fold Belt aquifer is of very low permeability and does not host significant groundwater resource (Parsons Brinckerhoff Pty Limited, 2012). Therefore, the porous rock aquifer is considered the primary water source target for the Project.

The depth of the water table in the Project Area can vary depending on topography. Along the ridges and upper slopes the depth is typically 25 to 35 m below the ground surface. Near the waterways, groundwater is approximately 3 m below the surface.

Groundwater users

A review of the Bureau of Meteorology's (BOM) Australian Groundwater Explorer indicates a total of 19 existing (and active) bores within the Project Area. A summary of the registered bores is presented in **Table 6-62** and shown on **Figure 6-24**. Anecdotal reports suggest that there are fewer active bores within the Project Area than those listed in **Table 6-62**.

Only one of these groundwater bores had data on its standing water level (SWL), being the Water NSW bore GW001147. This bore is located adjacent to Sandy Creek Road and within 500 m of waterways Sandy Creek and Lahey Creek. The bore is drilled to a depth of 17.9 m, and reports a SWL ranging between 5.52 m and 0.72 m below ground level.

Table 6-62 Registered bores within the Project Area

Bore ID	Bore depth (m)	Purpose	Status
GW011442.1.1	14.60	Stock and Domestic	Unknown
GW804231.1.1	6.50	Monitoring	Functional
GW804232.1.1	9.50	Monitoring	Functional
GW804464.1.1	85.00	Monitoring	Functional
GW804463.1.1	72.72	Monitoring	Functional
GW804462.1.1	61.00	Monitoring	Functional
GW804461.1.1	53.00	Monitoring	Functional

Bore ID	Bore depth (m)	Purpose	Status
GW804460.1.1	12.00	Monitoring	Functional
GW804459.1.1	85.00	Monitoring	Functional
GW804230.1.1	10.80	Monitoring	Functional
GW001147.1.1	17.90	Unknown	Unknown
GW804227.1.1	11.50	Monitoring	Functional
GW058583.1.1	53.30	Stock and Domestic	Unknown
GW001146.1.1	18.80	Unknown	Unknown
GW804448.1.1	73.23	Monitoring	Functional
GW804447.1.1	64.82	Monitoring	Functional
GW804446.1.1	53.84	Monitoring	Functional
GW804445.1.1	46.10	Monitoring	Functional
GW804444.1.1	73.00	Monitoring	Proposed

The extraction and use of groundwater for commercial activities requires a Water Access Licence (WAL), in particular, an aquifer interference licence (as discussed further in **Chapter 4.0 Statutory context**). A search of the NSW Water Register determined that there are no existing WAL's within the Project Area.

The Project Area overlies both the Lachlan Fold Belt and the Gunnedah-Oxley Basin MDB Groundwater Source. As the Project will target the porous rock aquifer of the Gunnedah-Oxley Basin, the Lachlan Fold Belt has not been considered further for water supply. The Gunnedah-Oxley Basin MDB Groundwater Source is allocated 23,109 unit shares for aquifer access licences, under the Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2020.

A search of the NSW Water Available Water Determinations (AWD) Register found that an AWD of 1 ML per unit share has been applied to aquifer access licence share components in the Gunnedah-Oxley Basin MDB Groundwater Sources for the 2024/2025 Financial Year (FY). Therefore, 23,109 ML of groundwater may be extracted, under aquifer interference licences, from the Gunnedah-Oxley Basin MDB Groundwater Source over this period (2024/2025 FY).

Groundwater dependent ecosystems

GDEs are those that rely, at least partially, on the surface expression of groundwater, as well as ecosystems reliant on the subsurface presence of groundwater.

There is a high probability of GDEs mapped within the Project Area's riparian zones; along the banks of Sandy and Laheys Creek (NSW Government, 2024b). Most of these areas have been avoided by the Development Footprint through the judicious design of project components.

An area of medium probability GDEs is mapped in the north eastern portion of the Project Area, though this has been excluded from the Development Footprint (NSW Government, 2024b). Outside of these areas, most of the Project Area is mapped as low probability GDE (NSW Government, 2024b).

The above results are consistent with the mapping provided in the Groundwater Dependent Ecosystems Atlas (BOM, 2024b). This Atlas also did not identify any aquatic GDEs within the Project Area.

An in-depth assessment of terrestrial GDEs was undertaken as part of the Cobbora Coal Project (EMM Consulting 2012). Key findings of this assessment include:

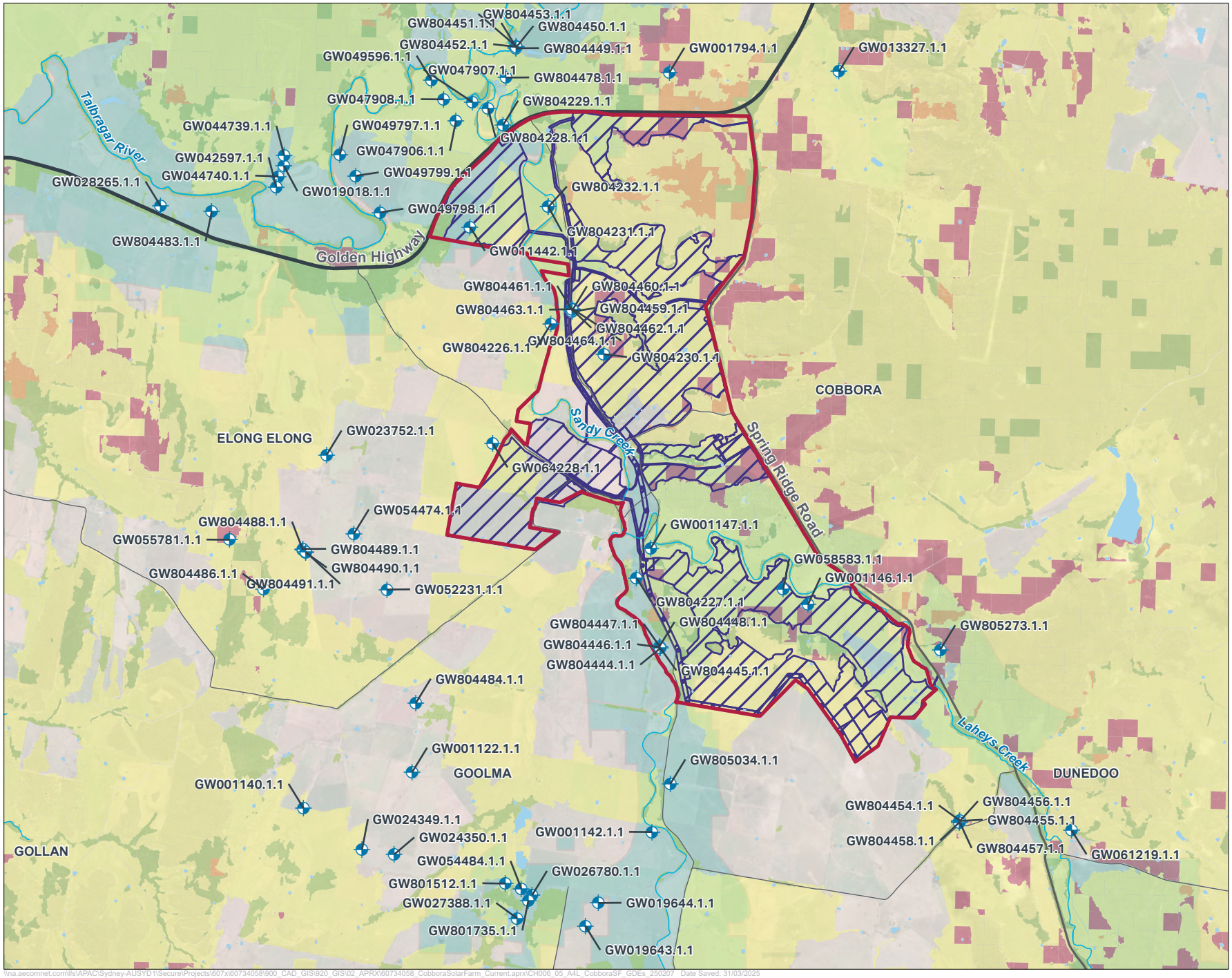
- Riparian zones occur on sandy loams characterised by eucalyptus species not typically known for groundwater dependency

- Riparian zones may have shallow aquifers which may be used by riparian vegetation as a water source, particularly in dry periods. Isotopic analysis identified these pools are likely to be derived from rainwater infiltration rather than groundwater.

GDEs are shown on **Figure 6-24**.

Groundwater quality

The Groundwater Vulnerability Map on the SEED Portal (NSW Government, 2024b) identifies areas where groundwater resources are vulnerable and may have an effect on development. Under the Warrumbungle LEP, the southern extent of the Project Area near Laheys Creek, as well as a parcel of land in the northeast corner of the Project Area, have been mapped as areas of groundwater vulnerability (NSW Government, 2024b). These areas are occupied by the Development Footprint (refer to **Figure 6-24**).



AECOM

N

0 1 2 km

Legend

- Project Area
- Development Footprint
- Groundwater vulnerability
- Waterbody
- Watercourses
- Motorway
- Main road
- Local road
- Groundwater boreholes

Groundwater probability

- High
- Medium
- Low
- Non GDE

FIGURE 6-24: GROUNDWATER DEPENDENT ECOSYSTEMS, GROUNDWATER USERS AND GROUNDWATER VULNERABILITY

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Source: Earthstar Geographics

6.10.4 Impact assessment

Construction

Surface water quality and drainage

Impacts to surface water quality and drainage may arise from earthworks associated with the Project, including site levelling and/or soil compaction. Earthworks and other construction activities have the potential to result in direct impacts to waterways through erosion and mobilisation of sediment, or construction materials entering the waterway and migrating downstream. This could adversely impact water quality through increased turbidity, lowered dissolved oxygen levels and increased nutrients.

Most of the Development Footprint has been designed to be at least 50 m from Sandy and Laheys Creek reducing the potential for construction activities to impact these waterways. Some ancillary infrastructure (ie internal roads or cabling) will be required to cross these waterways (discussed further below). Detailed controls are outlined in the Erosion and Sediment Control Plan (ESCP) in **Section 6.10.5** to further mitigate potential impacts, prepared in accordance with *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004).

Surface water may also become contaminated in the event of accidental spillages of fuel, lubricants, herbicides, sewage and other chemicals used during construction. The risk of surface water contamination during construction will be increased in the event of an extreme flood (between 1% AEP and probable maximum flood (PMF) event), where flood waters may inundate and overwhelm internal drainage systems and storage facilities, and contaminants may be mobilised into downstream waterways. Potential flooding impacts are discussed further in **Section 6.9**.

Despite this, with the implementation of the proposed management measures, impacts to surface water quality during the construction phase is considered to be low.

Riparian land

The Development Footprint has been designed to generally avoid works or infrastructure being located close to or within waterways or riparian corridors. However, some works to maintain existing waterway crossings and construct new crossings will be required in selected locations. The existing crossings are situated along the tributaries of Sandy Creek, with new creek crossings proposed along Sandy Creek and Laheys Creek (refer to **Section 3.0** for more detail).

These creek crossings will be required to connect internal access roads. Construction of new creek crossings will require earthworks and operation of heavy machinery and associated ground disturbance activities. To manage direct impacts to riparian land, crane platforms will be constructed at least 20 m from riparian land, where possible, with pre-cast bridges being lifted into place. No removal of riparian vegetation will be required, and disturbance will be avoided by using this construction method. Additionally, fish passage will not be impacted as any piers required for the prefabricated creek crossings will be located outside of the waterway.

Operation of heavy machinery will also be required near riparian land to facilitate electrical cabling, where the 33 kV and 330 kV overhead powerlines cross waterways. A similar construction method will be used, whereby machinery is operated as least 20 m from riparian land, and towers will be designed to be outside of riparian land.

Water use and supply

During construction, water will be required to support construction activities as well as for domestic purposes for workers (e.g. kitchen, laundry and bathroom activities). Water will also be required to support fire risk management activities.

Water demand for construction of the Project is estimated to be approximately 410 ML over the 36-month construction period (excluding commissioning works). As detailed in **Table 6-63**, this includes 325 ML for construction activities and 85 ML for domestic purposes.

Table 6-63 Estimated construction water demand

Aspect	Potable/Non-potable	Estimate (ML)
Construction activities		
Water usage for dust suppression/washdowns, earthworks/vegetation, fire risk management and concrete batching	Non-potable	325
Domestic purposes		
Water usage includes kitchen and showers	Potable	57
Water usage includes laundry and toilets	Non-potable	28
Overall total		**410**

Some of the key water demands for construction activities will include the following:

- Dust suppression/washdowns
- Bulk earthworks and material conditioning
- Vegetation re-establishment.

Water use for domestic purposes have been estimated using public guidelines detailing applicable load rates for wastewater generation.

Water supply arrangements are currently under further investigation and will be finalised during detailed design and/or by the construction contractor prior to construction commencing. The quality of water required will determine the suitability of the water supply option. For example, concrete batching facilities will require higher quality of water than other aspects of construction such as dust suppression and vehicle washdown.

It is anticipated that non-potable water (e.g. for construction and toilets) will be trucked to site or sourced from onsite licenced groundwater bores (existing or new). It is estimated that approximately 180 ML will be brought in via trucks and 173 ML will be sourced from groundwater bores.

Approximately 57 ML of potable water will be trucked to site by a commercial water tanker from a licensed source and stored in tanks within the facility. Potable water storages will be managed and maintained in accordance with the Australian Drinking Water Guidelines (ADWG) (NHMRC, 2011).

Water will also be opportunistically sourced from the following locations to minimise the need for imported water:

- Existing landholder dams, where harvestable rights apply
- Construction sediment basins (reuse)
- Rainwater tanks collecting runoff from building roofs (reuse).

Water licencing implications for the Project are detailed in **Chapter 4.0 Statutory context**.

Any new groundwater bore locations are yet to be determined but, if required, will be located within the Development Footprint, targeting the regional porous rock aquifer.

Construction of the Project requires approximately 58 ML per year (totalling 173 ML over the construction period) of groundwater be extracted from available sources within the Project Area. This requirement accounts for approximately 0.25% of the share components currently allocated for commercial extraction within the Gunnedah-Oxley Basin MDB Groundwater Source (23,109 ML over the 2024/2025 FY).

Given, the construction groundwater requirements of the Project comprise only a small fraction of the share components allocated for commercial extraction in the local groundwater sources, impact to local groundwater extent is likely to be low. Nonetheless, it is proposed that groundwater drawdown impacts to landholder bores be assessed using test production bores within the Development Footprint prior to construction commencing.

Wastewater from the accommodation facilities will be managed via an on-site septic system that will collect wastewater (blackwater and greywater) from kitchens, laundry, showers, toilets and basins. The system will be periodically emptied by a licensed contractor and disposed of at an appropriately licensed facility. System sizing will be based on the estimates provided in **Table 6-63** along with any additional loads that may be identified during detailed design. To reduce potential impacts to surface water, the system will be located at least 40 m from Sandy and Laheys Creeks.

Groundwater

Excavation work will be required for slabs and footings. The deepest excavation is expected to be for piles which will be either predrilled or pile driven. Typical pile depths will be about 2 to 3.5 m below ground surface. Given the shallow depths of groundwater reported at bore GW001147 (ranging between 5.52 m and 0.72 m – refer to **Section 6.10.3**), it is likely that groundwater may be intercepted during excavation work. This is unlikely to impact groundwater quality or levels, given the relatively shallow piling depths.

Incidental groundwater inflows into excavations will be monitored, recorded and reported to assess whether inflows exceed the licensing exemption threshold of 3 ML/year (refer to **Chapter 4.0 Statutory context**). The details of excavation depth will be determined during detailed design and once geotechnical studies have concluded for the Project.

There is a minor risk of contamination of groundwater due to accidental spillage of fuel, lubricants, herbicides, sewage, and other chemicals with appropriate mitigation measure in place. Therefore, the risk of constructing in an area mapped as groundwater vulnerability is considered low.

Groundwater drawdown impacts to nearby bore users are not anticipated, however will be assessed using test production bores prior to construction commencing (refer to **Section 6.10.5**).

As assessed by the Cobbora Coal Project (EMM Consulting 2012), high probably GDEs mapped along riparian corridors are unlikely to depend on groundwater sources. Additionally, groundwater resources proposed to be used for water supply will be from the deeper porous rock aquifers whereby terrestrial GDEs will rely mainly on the shallow aquifers (EMM, 2023). Therefore, GDEs are unlikely to be impacted by the Project.

Operation

Surface water quality and drainage

The following potential surface water quality impacts could occur during operation of the Project without the implementation of appropriate mitigation measures:

- Accidental spills or leaks of contaminants into surface waters, such as fuel, chemicals, oils, greases, solvents, demineralisers, and firefighting products, or the overflow or failure of the septic system
- Runoff from roads, carparks and hardstand areas (such as the BESS and substations) mobilising gross pollutants, hydrocarbons, metals, suspended sediments and nutrients
- Erosion and scouring leading to sediment mobilisation due to poor site stabilisation and/or re-establishment of ground cover.

In terms of drainage, the Project design includes newly impervious surface across the Development Footprint. This includes the surface area of all solar panels, as well as operational buildings, roads and other infrastructure. The new impervious surfaces (excluding solar panels) are not limited to one area but will be spread throughout the Development Footprint, which will reduce the risk of localised impacts from concentrated runoff during high rainfall events.

The solar panels will be mounted on a tracking system that will change orientation during the day, with any rainfall runoff being distributed onto the ground in the area around each panel depending on its orientation at the time, and not drained permanently to a single point on the ground. Land surrounding the solar panels will be stabilised and vegetated to promote retention and infiltration in a manner similar to, or better than, existing conditions. Given this, the Project is not expected to result in a measurable net change to overall site runoff potential. Drainage impacts are discussed further in **Section 6.9**.

Riparian land

No additional direct physical disturbance to riparian land is anticipated during operation. Ongoing maintenance of overhead powerlines will be required over the Project's operational life. This will be limited and will follow similar methods to the construction activities, whereby heavy machinery is kept at least 20 m away from riparian land.

The Project will likely have a minor beneficial impact to riparian land with the construction of four controlled creek crossings. Currently, uncontrolled creek crossings are likely contributing to ongoing bank erosion at these locations. The conversion of several of these into more formalised crossings with culverts will reduce the potential for vehicles to disturb sediment each time they cross, hence reducing adverse impacts to water quality. Some existing uncontrolled crossings may still be utilised during operation, however this will be minimal given the limited amount of workers required on-site and with the option to use the newly created culvert crossings available.

Water use and supply

Water demand for ongoing operation of the Project is estimated to be approximately 0.5 ML per year over 35 years. This is primarily comprised of water used for module cleaning, with other minor uses including dust suppression, amenities and washing of plant and equipment.

Approximately half of the operational water demand will be sourced from the onsite licenced groundwater bores, with the other half being trucked to site under commercial arrangement and stored in tanks (consistent with the arrangement for construction).

Operational water supply options will be subject to ongoing refinement as the Project progresses through detailed design. Module cleaning may not be required every year, however, estimates for water use have assumed an annual cleaning frequency. Operational water considerations for maintaining sheep and fire suppression on site have not been included.

Operational water will also be opportunistically sourced from the following locations to minimise the need for imported water:

- Existing landholder dams, where harvestable rights apply
- Rainwater tanks collecting runoff from building roofs (reuse).

Water licencing implications are detailed in **Chapter 4.0 Statutory context**.

Decommissioning will use the same water source as the operational supply, pending demand and approvals.

Operation of the Project requires 0.25ML per year of groundwater be extracted from available sources within the Project Area. Given the annual operational requirement accounts for less than 0.001% of the share components currently allocated for commercial extraction within the Gunnedah-Oxley Basin MDB Groundwater Source (23,109 ML over the 2024/2025 FY), impact to local groundwater extent will be minimal.

Groundwater

The operation of the Project is not anticipated to impact on groundwater except for an increase of impermeable surfaces in the Development Footprint. This may result in very minor localised decreases in groundwater levels due to a reduction in recharge to groundwater aquifers. This impact is anticipated to be negligible given the size and undeveloped nature of the overall catchment area.

The same impacts identified above for surface water impacts (ie accidental spills, leaks of contaminants, runoff from impervious surfaces etc) can lead to impacts to groundwater. This impact is expected to be minor with appropriate mitigation measure in place.

Groundwater drawdown impacts to nearby bore users are not anticipated, however will be assessed using test production bores prior to construction commencing (refer to **Section 6.10.5**).

Groundwater resources will be used during operation as a non-potable water source. As assessed above for construction, impacts on terrestrial GDEs is considered unlikely.

6.10.5 Management and mitigation measures

Erosion and sediment control

Erosion and sediment control (ESC) has been identified as a potential risk associated with the Project. Section 5.0 of **Appendix O (Flood Impact Assessment)** summarises ESC considerations for the Project (detailed below).

The Blue Book outlines the guidelines to help mitigate the impacts on land disturbance activities on soil, landforms and receiving waters. This guideline outlines the development, implementation, instatement and monitoring requirements for ESCPs, which are typically developed by Certified Professionals in Erosion and Sediment Control (CPESCs).

The proposed ESC approach for the Project is outlined in **Table 6-64**. Specific ESC-related management and mitigation measures are provided in **Table 6-59**.

Table 6-64 Overall erosion and sediment control strategy

Project phase	Proposed approach
Construction	The EPC contractor is proposed to enact a Construction ESCP prepared consistent with the “Blue Book” (Landcom, 2004). The ESCP will include measures to ensure: • Development of ESC sequencing, such that erosion and sediment control measures are instated prior to any significant construction works • Implementation of ESC devices, such as silt fencing, sediment traps, stormwater drains and other measures. The stormwater network is expected to comprise: - Perimeter diversion drains associated with infrastructure areas (i.e. Carpark, BESS, substations, etc.) - Local drains for infrastructure areas • Dust suppression whenever necessary.
Operation	The ongoing management of the Project will operate according to an ESCP developed for the Project lifespan. Ongoing ESC management may include: • Management of the stormwater network, including ongoing inspection, monitoring and if necessary, remediation • Management of access track surfaces, and solar panel area extents • Monitoring of drainage paths in proximity to site infrastructure, bridge structures, and remedial works, if required.
Decommissioning	Decommissioning of the Project will operate according to an ESCP specific to the decommissioning and rehabilitation program. The execution of the ESCP will depend upon the parties involved in the decommissioning program, which is likely to involve an EPC contractor.

Management and mitigation measures to avoid, minimise, or manage potential surface water, groundwater and water usage impacts as a result of the Project are detailed in **Table 6-65**.

Measures which also relate to potential water impacts are captured in **Section 6.5** and **Section 6.9**.

Table 6-65 Management and mitigation measures – Water

ID	Management and mitigation measure	Timing
W1	The use of bore water during construction and operation will be agreed with bore water users in the area. A Water Access Licence (WAL) will be obtained prior to extraction commencing if required.	Construction and Operation
W2	A Water Sourcing Strategy will be developed and included as part of the CEMP. This will: • Identify suitable water sources to support construction activities. This will be undertaken in consultation with water suppliers and • Aim to minimise impacts to the water supplies of adjacent landowners and/or other relevant stakeholders during construction	Detailed design
W3	Potable water storages will be managed and maintain in accordance with the Australian Drinking Water Guidelines (ADWG) (National Health and Medical Research Council, 2011).	Construction and Operation
W4	Wastewater generated by amenities will be collected in tanks and periodically removed by a suitably licensed waste contractor. During operation wastewater will be managed by either collection in tanks and periodic removal by a suitably licensed waste contractor or by the use of a small on-site aerated wastewater treatment system.	Construction and Operation
W5	Waterway crossings will be designed and constructed to: • Consider the appropriate level of serviceability and flood immunity required for the Project • Consider local hydraulic conditions and designed to minimise scour and erosion potential • Minimise local flooding impacts • Be consistent with relevant guidance including the *Guidelines for watercourse crossings on waterfront land* (DPE 2022) and *Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway* Crossings (Fairfull, S. and Witheridge, G. 2003).	Detailed design and Construction
W6	A bore census will be undertaken to confirm if the Cobbora mine exploration bores have been decommissioned, repurposed, or could be used for water supply.	Detailed design
W7	Groundwater drawdown impacts to landholder bores will be assessed using test production bores. Information will support development of the Water Sourcing Strategy.	Detailed design

6.11 Hazards and risk

6.11.1 Secretary's Environmental Assessment Requirements

Table 6-66 sets out the SEARs relevant to hazards and risk and where the requirements have been addressed in this EIS.

Table 6-66 SEARs – Hazards and risk

Relevant SEARs	
Hazards	**Where addressed**
The EIS must address the following specific matters: • Dangerous Goods – a preliminary risk screening completed in accordance with *State Environmental Planning Policy (Resilience and Hazards) 2021*;	The preliminary risk screening is detailed in **Section 6.11.4**
• Battery Energy Storage System – a Preliminary Hazard Analysis (PHA) must be prepared in accordance with the *Hazardous Industry Planning Advisory Paper No. 6, 'Hazard Analysis' and Multi-Level Risk Assessment* (DoP, 2011b). The PHA must consider all recent standards and codes and verify separation distances to on-site and off-site receptors to prevent fire propagation and compliance with *Hazardous Industry Advisory Paper No. 4, 'Risk Criteria for Land Use Safety Planning* (DoP, 2011c); and	The Preliminary Hazard Analysis is available in **Appendix M (Preliminary Hazard Analysis)** and summarised in this chapter
• Health – an assessment of potential hazards and risks including but not limited to bushfires, spontaneous ignition, electromagnetic fields or the proposed grid connection infrastructure against the International Commission on Non-Ionizing Radiation Protection (ICNIRP) *Guidelines for Limiting Exposure to Time-varying Electric, Magnetic and Electromagnetic Fields*;	Potential hazards and risks (including health risks) are assessed in **Section 6.11.4**. A bushfire threat assessment is detailed in **Section 6.12**
• Bushfire – a bushfire hazard assessment completed by a suitably qualified consultant and identifies potential hazards and risks associated with bushfires including the risks that a solar farm will cause bush fire and demonstrate compliance with Planning for Bush Fire Protection 2019;	A bushfire threat assessment is detailed in **Section 6.12**
• an assessment of the likely impacts associated with the high-pressure pipeline traversing the site in consultation with APA Group.	Impacts associated with the high-pressure pipeline are detailed in **Section 6.11.4**.

6.11.2 Methodology

A PHA was prepared by Planager to assess the potential hazards and risks associated with the construction and operation of the Project. This is attached as **Appendix M (Preliminary Hazard Analysis)**.

The following steps were undertaken to prepare the PHA:

- Establish the existing environment and surrounding land uses
- Undertake a risk screening to determine whether the Project is considered a 'potentially hazardous development' as defined in the Hazardous and Offensive Development Application Guidelines: Applying SEPP 33 (DoP, 2011a), with consideration of the following factors:
    - Storage of hazardous materials
    - Transport of hazardous materials to and from the Project Area
    - Other types of hazards.
- Identify hazards associated with the Project

- Assess the risk of on-site and off-site impacts resulting from identified hazards, including from electric and magnetic fields
- Evaluate the tolerability of each risk through a risk matrix after risk treatments have been applied.

Electric and magnetic field assessment

Electrical equipment, when in service, produces an electric field and a magnetic field. Electric fields are associated with the voltage of the equipment and magnetic fields are associated with the amperage. In combination, these fields cause energy to be transferred along electric wires.

- Electric fields: Associated with voltage (i.e., like pressure in a hose, pushing electricity through a wire). Being related to voltage, the electric fields associated with high voltage equipment remain relatively constant over time, except where the operating voltage changes. The strength of the electric field depends on the voltage and is present in any live wire whether an electrical appliance is being used or not.
- Magnetic fields: Associated with amperage (i.e., electrical current, like the flow of water in a hose). Being related to current, the magnetic field strength resulting from an electrical installation varies continually with time as the load on the equipment varies.

The electric and magnetic fields (EMF) associated with electrical equipment, whilst interrelated, are not dependent on each other and as such can exist independently.

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) states that there is no established scientific evidence that exposure to EMF causes adverse health effects (ARPANSA, n.d.). ARPANSA have adopted the Guidelines for Limiting Exposure to Time-varying Electric, Magnetic and Electromagnetic Fields from the International Commission on Non-Ionizing Radiation Protection (ICNIRP 2020 Guidelines) for use in Australia. The EMF predictions for the following Project elements have been compared to the Reference Levels for human exposure to EMFs outlined in the ICNIRP 2020 Guidelines:

- Substations
- High voltage (HV) transmission lines
- 33 kilovolt (kV) transmission line
- Power conversion unit (PCU)
- The BESS.

6.11.3 Existing environment

The Project Area's exposure to existing environmental risks is summarised in **Table 6-67**.

Table 6-67 Environmental baseline

Name	Potential outcome	Site-specific risk
Bushfire	Bushfire may result in damage to infrastructure, initiation of a thermal runaway reaction and fire at the batteries, or transformers, or loss of life.	A Bushfire Threat Assessment has been prepared for the Project and is attached as **Appendix N (Bushfire Threat Assessment)**. The assessment identified bushfire prone land (i.e. land that could support or be subject to bushfires) within and surrounding the Project Area, and that such land requires specific management strategies to reduce the risk of bushfire occurrence or spread, as shown in **Figure 6-26**. Further details of existing bushfire risks associated with the Project Area is provided in **Section 6.12**.

Name	Potential outcome	Site-specific risk
Flooding	Flooding could result in the accidental spill or discharge of chemicals or hydrocarbons (e.g. fuels and oils in vehicles and equipment) with could contaminate surface water or groundwater.	A Flood Impact Assessment was prepared for the Project and is attached as **Appendix O (Flood Impact Assessment)**. The assessment identified that some flooding will occur around Sandy Creek and Laheys Creek within the Project Area in both 20% and 1% AEP flooding scenarios, but that flooding will be generally contained to the creek crossing where Golden Highway crosses Sandy Creek immediately north of the Project Area. However, LEP maps for both the Dubbo Regional and Warrumbungle Shire identified no flood prone land within the Project Area (refer to **Table 4-5**) Further details of existing flooding risks associated with the Project is provided in **Section 6.9**.
Earthquake and landslide	Earthquakes and landslides could result in an initiation of a thermal runaway reaction and fire at the batteries, and an oil spill and fire at the transformers.	A search of the Geoscience earthquake hazard map (Geoscience Australia, 2018) indicated a low risk of earthquakes occurring at the Site. A search of the NSW Planning Portal Spatial Viewer indicated that the Project Area is not located within a known and mapped mine subsidence district.
Lightning strike	Lightning strike could result in damage to Project infrastructure, the initiation of a thermal runaway reaction and fire at the batteries, and an oil spill or fire at the transformers.	A search of the Bureau of Meteorology indicated that lightning-ground flash density is two to three flashes per square kilometre per year (km^2/year) and 20 to 25 days with thunder heard per km^2/year for the Project Area, which is similar to much of the east coast of NSW including Sydney (BOM, 2024b).

6.11.4 Impact assessment

Preliminary risk screening

In accordance with Applying SEPP 33 (DoP, 2011a), the following hazards were considered in the preliminary risk screening:

- Storage of:
  - Compressed refrigerant gas in the battery enclosures
  - Flammable liquids in small containers e.g. solvents not exceeding 20 L or diesel for use in the diesel generator not exceeding 5 tonnes
  - Petroleum products i.e. up to 700-800 m^3 of transformer oil and diesel
  - Herbicide
  - Corrosive liquids in small containers e.g. acids for use during maintenance cleaning, held on-site in dangerous goods cabinets, not exceeding 5 tonnes
  - Lithium ion (Li-ion) batteries held within battery enclosures
  - Coolant in each battery enclosure, e.g. mixture of ethylene and glycol

- Transport of:
  - Li-ion batteries within the BESS
  - Coolant in each battery enclosure, e.g. mixture of ethylene and glycol
  - Compressed refrigerant gas in the enclosures
  - Petroleum and diesel products i.e. up to 700-800 m^3 of transformer oil and diesel
- Other risk factors considered relevant to the Project, including:
  - Material incompatibility, reactivity and instability that could lead to uncontrolled reactions or decomposition (e.g. Li-ion batteries, hydrogen, or toxic gases)
  - Hazardous wastes
  - Hazardous activities or process conditions
  - Known past incidents (and near misses) in similar industries
  - Environmental sensitivities within and near the Project Area.

The results for the preliminary risk screening for the Project were:

- The expected transport and storage of hazardous materials associated with the Project will not exceed the relevant risk screening threshold
- Based on other risk factors reviewed, five hazardous incident or event scenarios are relevant to the Project:
  - Thermal runaway (including due to spontaneous ignition) and fire in a battery enclosure, which has the potential to be harmful to people in the area and to lead to fire propagation to other nearby infrastructure (i.e., damage to the environment and/or non-Project infrastructure from the Project)
  - Loss of containment of pollutant material, e.g. oil, cooling medium, or diesel. In particular, the environmentally constrained land within the Project Area is vulnerable to any degree of pollution and requires protection
  - Electrical fault or failure to control electrical energy (including EMF) resulting in harm to people or nearby infrastructure
  - Fire in nearby area (bushfire, or high pressure pipeline) may cause damage and escalation to Project infrastructure (i.e., damage to Project infrastructure from external sources)
  - Incident during construction activity causes damage to Project or external infrastructure, e.g. damage to the high pressure pipeline or to the integrity of a battery enclosure.

On the basis of storage and transport of hazardous materials alone, the development will not be considered potentially hazardous. However, based on the other types of hazards identified (and the Project SEARs), an assessment of potential hazards associated with the Project through a PHA is required under Chapter 3 of *SEPP (Resilience and Hazards) 2021*. The PHA is provided as **Appendix M (Preliminary Hazard Analysis)** and summarised in the following sections.

Preliminary hazard and risk assessment

In accordance with the findings of the preliminary risk screening, and the SEARs, a preliminary hazard and risk assessment has been prepared for the Project. **Table 6-68** summarises the hazardous event scenarios with a potential to result in impacts rates as a major (or greater) consequence to people (injury and/or fatality), the environment and/or to nearby infrastructure.

Overall, the on-site and off-site risk profile is rated as either ‘as low as reasonably practicable’ (ALARP) or better, meaning the risk has been mitigated to a level where the benefits of further mitigation will be disproportionate to the costs associated with further mitigation.

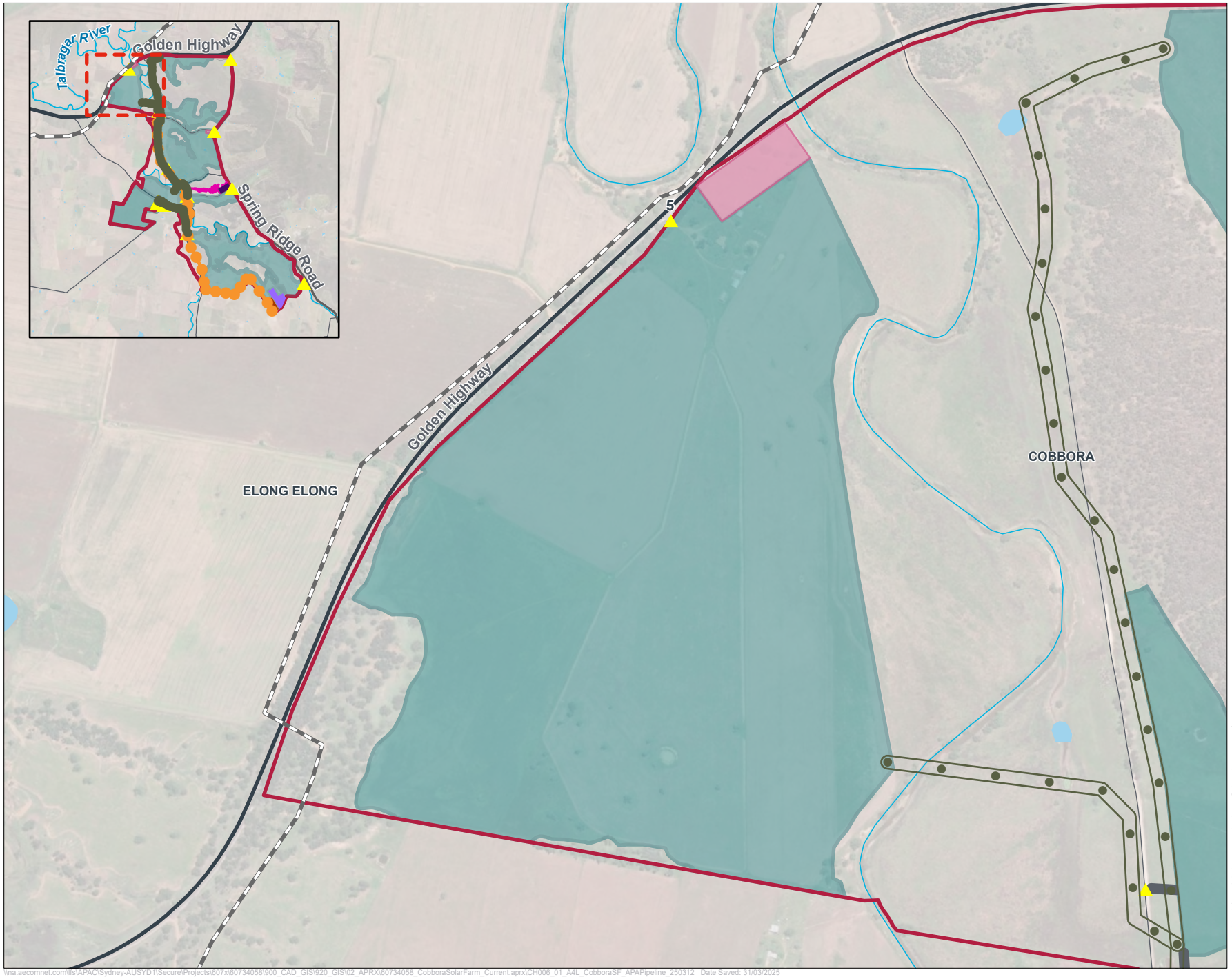
A detailed evaluation of potentially hazardous incident scenarios is provided in Appendix 2 of **Appendix M (Preliminary Hazard Analysis)**.

Table 6-68 Hazard analysis and risk assessment

ID	Hazardous incident / event	Findings	On-site risk	Off-site risk
1	Thermal runaway in a BESS battery enclosure	A battery event may be initiated by a thermal runaway and spontaneous ignition within a battery cell which propagates to other parts (e.g. cells, modules, racks) within the enclosure. This may be caused by an electrical system failure (e.g. damage to wiring, fuse or breaker failure) or by mechanical interference (e.g. mishandling, rodent, damage impact during construction activities). The following risks are possible from a thermal runaway event: • Generation of heat from a fire • Generation of toxic combustion gases from a fire. This scenario assumes all protective functions and controls have failed and consists of a fully developed fire or explosion in one battery enclosure, with generation of toxic gases from burning plastic cabling and other combustible material inside the enclosure. Such a scenario is considered the worst-case-credible fire. The closest battery cell enclosures will be located at least 25 m from existing vegetation outside of the Project Area. With this clearance, the heat radiation level associated with the BESS fire is not likely to exceed 1 kW/m^2 off-site, which is below the 3 kW/m^2 threshold commonly defined as the heat radiation level which could cause discomfort. In addition, the BESS is located in a rural area and there is a considerable separation distance to the nearest sensitive receptor, and the risk of injury from inhalation of toxic gases is considered remote to rare for on-site and off-site receptors, respectively. As such, there will be no significant impact on adjacent land users expected from this scenario.	ALARP	Acceptable
2	Loss of containment of pollutant material (e.g. oil from the transformers, coolant from the HVAC system in the BESS or diesel from the diesel generator)	A loss of containment of pollutants may lead to ground and groundwater contamination and pollution of nearby waterways, if not contained. There is also the potential for personal injury arising from exposure to irritant material. The requirements under the Australian Standards are sufficient to ensure the risk associated with environmental pollution at the Project infrastructure associated with the Project can be managed to ALARP principles. These requirements will be	ALARP	Acceptable

ID	Hazardous incident / event	Findings	On-site risk	Off-site risk
		addressed during the detailed design phase of the Project and will include a range of prevention, protection, detection and emergency response controls as specified in Appendix 1 of **Appendix M (Preliminary Hazard Analysis)**.		
3	Electrical fault or failure to control electrical energy at electrical equipment (e.g. inverters, MV/HV transformers, substations, electrical connections and gantries) causing fire, arc flash, or EMF	The Project will generate sufficient energy to cause an arc flash in the case of a short circuit or fault. Arc flashes can be dangerous since they can cause serious burns and/or electrocution. Arc flash temperatures can exceed 12,000°C and are therefore capable of melting metal, causing fires and/or explosions. The requirements under the Australian Standards and typical management practices for Low, Medium and High Voltage systems are sufficient to ensure the risk associated with electrical fault or failure at the electrical infrastructure associated with the Project can be managed to ALARP principles.	ALARP	Acceptable
		All equipment powered by electricity produces EMFs. The Project will introduce sources of EMF associated with electrical infrastructure. The EMF impact assessment (see below) concluded that the EMF levels generated by the Project are compliant with the applicable Australian and international standards and guidelines, specifically the ICNIRP reference levels. As such, the on-site and off-site risk from EMF can be managed to ALARP principles.	ALARP	Acceptable
4	Fire in nearby area causes damage and escalation to Project infrastructure or fire on-site leads to fire in nearby area. Other external hazards: lightning, earthquake, flood	The bushfire assessment sets an APZ of 11-25 m between Project infrastructure and surrounding vegetation, increased to 32-250 m between the BESS and surrounding vegetation. This separation distance exceeds the basic requirement for APZ in Planning for Bush Fire Protection: A guide for councils, planners, fire authorities and developers for wind and solar farms (NSW RFS, 2019) of 10 m. Further details of risks to Project infrastructure from a bushfire are provided in **Section 6.12**. While a fire at the APA pipeline may potentially cause damage and propagation of fire to Project infrastructure, a major incident at the pipeline is considered extremely unlikely (provided that the Codes and Standards listed in the PHA are adhered to and that the requirements by APA Group for control during construction activities and management are followed). The risk associated with the presence of the APA Group pipeline near the Project Area is very low.	ALARP	Acceptable

ID	Hazardous incident / event	Findings	On-site risk	Off-site risk
		Additionally, natural hazards from wind, lightning, etc. will be managed through Project design and compliance with relevant Codes, as far as practical. There is a low risk of earthquakes occurring at the Site, and the Project Area is not located within a known and mapped mine subsidence district. The mapped lightning-ground flash density of the Project Area is similar to much of the east coast of NSW, meaning the likelihood of lightning strike of Project infrastructure is considered low to moderate.		
5	Incident during construction activity causes damage to Project or external infrastructure	Construction activities have the potential to damage the APA Group pipeline. The APA Group pipeline runs adjacent to the north-western corner of the Project Area, but avoids the Development Footprint (refer to **Figure 6-25**). An incident during construction activities could potentially result in damage to the pipeline. Damage of the pipeline may lead to loss of containment of gas which, if ignited, will burn as a jet fire. The heat radiation may theoretically propagate to Project infrastructure by initiating a fire in the oil storage at a PCU. However, given the distance between the Development Footprint and the pipeline and requirements for managing this risk are detailed in existing Codes and Standards listed in the PHA, the risk of damaging the pipeline during construction activities is considered rare.	ALARP	Acceptable



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N

0 140 280 m

Legend

- Project Area
- 33kV easement
- Solar array area
- Construction areas
- Waterbody
- Motorway
- APA high pressure gas pipeline
- 33kV poles
- Access points

FIGURE 6-25: APA GROUP HIGH PRESSURE EASEMENT IN RELATION TO THE PROJECT AREA BOUNDARY

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Source: Earthstar Geographics, Maxar

Electric and magnetic fields (EMF)

ARPANSA states that there is no established scientific evidence that exposure to EMF causes adverse health effects (ARPANSA, n.d.). Notwithstanding, EMF has been considered in association with the operation of the Project. An assessment has been undertaken to understand the EMFs likely to be generated and their potential to impact workers and the public.

Typical values of magnetic fields measured near powerlines and substations are listed in **Table 6-69**.

Table 6-69 Typical values of magnetic fields of infrastructure associated with the Project

Source	Location of measure	Range of measurement milligauss (mG)
Grid substation	At substation fence	1 – 8
High voltage powerlines	Directly underneath (if overhead)	10 – 200
High voltage powerlines	At edge of easement	2 – 50
33 kV underground cable	At one metre above ground level	24
	20 m from source	1
33 kV above ground cable	Directly underneath	10 – 200
	At edge of easement	2 – 50
The PCU – assuming the same levels as substation	Outside PCU	1 – 8
The BESS – assuming the same levels as substation	Outside battery cabinet	1 – 8

In 2016, ARPANSA adopted the international guideline for recommended electric and magnetic fields limits (ICNIRP, 2020) (**Table 6-70)**. The reference levels set out in this guideline are derived from the levels at which interactions with the central nervous system are established, with a safety factor applied and a further adjustment to simplify compliance measurement. It should be noted that these criteria are independent of duration of exposure.

Table 6-70 ARPANSA limits – electric and magnetic fields, (2002, updated 2016)

Field type	Public limits		Occupational limits	
	Magnetic field (mG)	Electric field (V/m)	Magnetic field (mG)	Electric field (V/m)
Reference Levels for Time Varying Fields at 50 Hz (AC)	1,000	5,000	5,000	10,000
Guidance Levels for Static Fields (DC)	566,000	14,100	2,830,000	28,300

Table notes: Limits for magnetic fields have been shown in the above table in milligauss (mG) for consistency with the rest of this chapter. The ARPANSA guidelines display these values in microTesla (μT). For comparison, 10 mG =1 μT.

The magnitude of the EMF at a location is inversely proportional to the distance from the current carrying elements. As such, increasing the distance between the conductor and the receiver is a valid approach to managing EMF exposure.

The closest residential receivers to EMF-emitting Project infrastructure are:

- Over 700 m from the nearest substation
- Over 1 km from the BESS.

These distances are greater than the distances generally considered safe from exposure to electric or magnetic fields.

There are also several operational and maintenance buildings proposed at the Project. The buildings will not be permanently occupied and will only be used on an intermittent basis.

Given the typical separation distances between the magnetic and electric field producing equipment from sensitive receivers, and the low levels of EMFs expected to be produced by the Project, to the impact of EMF exposure to workers or the public will be low. It is considered unlikely that the EMF generated by the Project will exceed the ICNIRP and ARPANSA occupational and public exposure reference levels detailed in **Table 6-70**. Consequently, the risk of EMF exposure is likely able to be managed in line with ALARP principles.

ALARP principles

The Project is not considered potentially hazardous in accordance with the DPHI's definition, based on the storage and transport of hazardous materials. Potential hazards from the Project are predominantly associated with the risk of a fire associated with the Li-ion batteries and of environmental pollution from a spill of oil or other pollutant, with other risks associated with electricity and standard construction related hazards.

It is concluded that the Project can be managed in accordance with the established risk criteria and in accordance with ALARP principles. Management and mitigation measures are provided in **Section 6.11.5**.

6.11.5 Management and mitigation measures

Management and mitigation measures that will be implemented for the Project to address hazards and risks are listed in **Table 6-71**.

Most hazards identified in the above assessment can be avoided or mitigated by employing a combination of standard measures, including following the applicable Australian/New Zealand Standards and Codes and referring to international Standards where appropriate. A likely list of those that will be considered is provided in **Appendix M (Preliminary Hazard Analysis)**.

Table 6-71 Management and mitigation measures – hazard and risk

ID	Management and mitigation measure	Timing
HR1	Solar farm equipment and systems will be designed and tested to comply with the relevant Australian Standards and Codes and/or with at least one major International Code.	Detailed design
HR2	The BESS will be certified under internationally recognised test methods such as the Underwriters Limited (UL) 9540A Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage System.	Detailed design
HR3	An electrical isolation protocol will be put in place during construction as well as during commissioning and operation of the electrical equipment.	Detailed design, Construction and Operation
HR4	Preventative maintenance practices will be put in place, including maintenance schedules and calibration of equipment, instruments and sensors, APZ, vegetation control within the Development Footprint, and Non-Destructive Testing as recommended by manufacturer(s).	Operation
HR5	Warning signs will be installed and maintained as per Code and Standards requirements, including Dangerous Goods signage and High / Medium voltage warnings (including arc flash).	Detailed design, Construction and Operation

ID	Management and mitigation measure	Timing
HR6	Earthing of electrical equipment will be established.	Detailed design and Construction
HR7	Lightning protection will be determined in accordance with Australian Codes at the detailed design stage. This protection will be implemented into the design and constructed.	Detailed design and Construction
HR8	The BESS and high voltage equipment will be housed within a secure fenced area. On-site security protocols will be developed and implemented.	Detailed design, Construction and Operation
HR9	The risk of seismic activity, dust storm and severe winds will be integrated into the design of the BESS, through the application of the relevant Australian Standards.	Detailed design
HR10	The detailed design for the Project will consider the ARPANSA Standard (2016) and ICNIRP guideline (2020) [as part of the electrical design.	Detailed design
HR11	Procedures in relation to high voltage installation and operation will be adhered to throughout the life of the Project.	Construction and Operation
HR12	Public access to the work areas within the Development Footprint will be restricted throughout the life of the Project and all facilities will be kept locked.	Construction and Operation
HR13	The Preliminary Hazard Analysis prepared for the EIS (provided in **Appendix M (Preliminary Hazard Analysis)**) will be re-evaluated based on detailed design to ensure that aspects considered (i.e. control measures, clearances between BESS units, separation distance) and associated mitigation measures are still valid.	Detailed design

6.12 Bushfire

6.12.1 Secretary's Environmental Assessment Requirements

Table 6-66 sets out the SEARs relevant to hazard and risk, in relation to bushfires, and where the requirements have been addressed in this EIS.

Table 6-72 SEARs – Bushfire

Relevant SEARs	
Hazards	**Where addressed**
The EIS must address the following specific matters: • Bushfire – a bush fire hazard assessment completed by a suitably qualified consultant and identifies potential hazards and risks associated with bushfires including the risks that a solar farm will cause bush fire and demonstrate compliance with Planning for Bush Fire Protection 2019.	• The bushfire risk associated with the Project is assessed in this chapter and **Appendix N (Bushfire Threat Assessment)**.

6.12.2 Methodology

A Bushfire Threat Assessment (BTA) was prepared by BlackAsh Bushfire Consulting to assess the potential bushfire hazards and risks associated with the construction and operation of the Project. This is attached as **Appendix N (Bushfire Threat Assessment)**.

The following steps were undertaken to prepare the BTA:

- Reviewing landscape scale risks including the bushfire history and bushfire prone nature of the Project Area

- In accordance with Planning for Bushfire Protection (NSW RFS, 2019), assess the potential for construction and operational activities to:
  - Result in bushfire impacts to people and the environment, and
  - Be affected by bushfires originating off-site or from external sources
- Determining the required asset protection zone (APZ) for both construction and operational built infrastructure in accordance with Planning for Bushfire Protection 2019 (NSW RFS, 2019).

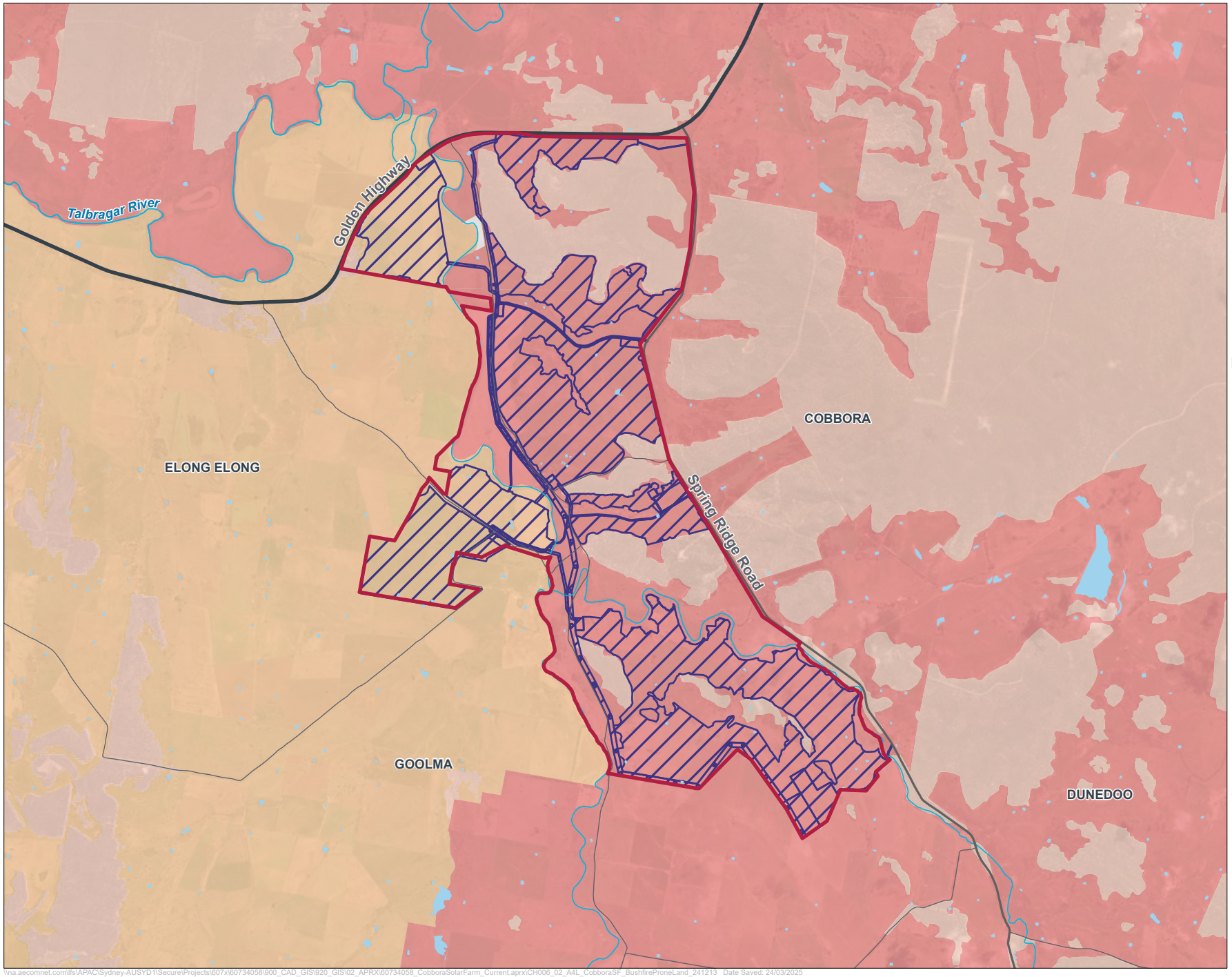
6.12.3 Existing environment

The likelihood of a bushfire starting and spreading within a particular landscape can be assessed through consideration of regional fire weather, slope, historic fire occurrence, vegetation type and extent, fragmentation of land and access. These aspects are outlined in **Table 6-73**.

Table 6-73 Existing bushfire risks within and surrounding the Project Area

Aspect	Description
Regional fire weather	Bushfire season in the region generally commences on 1st October and concludes 31st March each year. Prevailing weather conditions associated with the bushfire season in the region are north to westerly winds created by consecutive high pressure systems causing high daytime temperatures. Such hot winds are usually very dry with low relative humidity, often below 20%. This means that bushfires in the vicinity of the Project Area are most likely to originate from the north-west.
Slope	Slopes supporting bushfire prone vegetation affect fire behaviour, rate of spread, and intensity. Landscapes with steeper slopes have a higher bushfire risk. Slopes within and surrounding the Project Area are limited and relatively flat.
Historic fire occurrence	While the Project Area has not been subject to bushfires directly, the surrounding region has a history of high intensity and landscape scale bushfires. There are three records of bushfires in the surrounding region since records began in the 1990s: 2007-08 (approximately 26,600 ha burnt) 2016-17 (approximately 55,000 ha burnt) 2019-20 (approximately 3,700 ha burnt).
Vegetation and bushfire prone land	Vegetation within and surrounding the Project Area broadly consists of: • Dry sclerophyll forests • Forested wetlands in riparian zones • Grasslands • Grassy woodlands. Bushfire prone land is defined as an area of land that can support a bushfire. As shown on **Figure 6-26**, the Project Area is mapped as bushfire prone land. Most of the Project Area is mapped as Category 2 (lowest risk), with pockets of Category 1 (highest risk) and Category 3 (moderate risk). The land surrounding the Project Area is mapped as Category 1 to the east and north, Category 2 to the south, and Category 3 to the west of the Project Area.
Fragmentation	Bushfire risk can be mitigated by the creation of natural or human-made bushfire breaks (i.e Fragmentation). Natural land fragmentation within and surrounding the Project Area is provided by the Talbragar River, Golden Highway, other local roads, rural properties, and various agricultural activities that remove and modify fuel loads at various times throughout the year.
Access	Existing public and private access roads within and surrounding the Project Area are capable of supporting firefighting, fire suppression, and safe evacuation activities.
Forest Fire Danger Index (FFDI)	The FFDI measures the degree of danger of fire in Australian vegetation and dictates the size of APZs required to protect assets. Like much of NSW, the

Aspect	Description
	Project Area has an FFDI of 80, which equates to an ‘Extreme’ rating. Bushfires in these areas are fast-moving and more frequently uncontrollable.



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N

0 1 2 km

Legend

- Project Area
- Development Footprint
- Waterbody
- Watercourses
- Motorway
- Main road
- Local road

Bushfire Prone Land

- Category 1
- Category 2
- Category 3

FIGURE 6-26: BUSHFIRE PRONE LAND

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Source: Earthstar Geographics

6.12.4 Impact assessment

Construction

Construction activities pose the risk of starting a fire on-site in cured vegetation (i.e., highly flammable dried-out plant material), which may result in a fire escaping into surrounding land. This risk mainly arises from construction works involving:

- High temperatures or the generation of sparks, such as:
  - Bulldozers, excavators, and vegetation removal machinery (e.g., slashers and mulching machines) that could produce sparks if steel blades strike rock
  - Welding and grinding activities
  - Electrical equipment installation.
- Sparks from vehicle exhaust that could ignite grassland and leaf litter
- Inappropriate storage of chemicals (including failure to clean up a spill) which may lead to a chemical fire or explosion.

A fire starting on-site and potentially escaping to surrounding land could rapidly escalate and endanger people living nearby and could result in damage to surrounding properties and farmland, dwellings and sheds, or the environment.

Construction workers and activities may also be affected by bushfire events originating off-site or from external sources. There is an occupational risk of harm to construction workers during a bushfire event who are not familiar with the local area if emergency response plans are inadequate or access points to the Project Area are inconsistent. The lives of construction workers and other people utilising the same evacuation routes could be endangered if this risk is not appropriately managed.

Operation

Once operational, an uncontrolled bushfire has the potential to endanger the lives of operational maintenance workers, nearby residents, and livestock grazing within and surrounding the Project Area. An uncontrolled bushfire could also damage or destroy critical infrastructure to an extent that may disrupt power transmission from the Project. This risk will be heightened during windy conditions, higher temperatures, and low humidity, and if emergency evacuation routes (including both roadside vegetation and the roads themselves) are not appropriately maintained.

However, the Project will further fragment the land within the Project Area through access tracks and creek crossings, which will contribute to reducing bushfire risks to the Project from external sources, and evacuation routes will be maintained.

Potential operational bushfire risks originating from the Project may arise from operational maintenance activities, similar to construction activities. Once operational the addition of high voltage electrical infrastructure within the Project Area will introduce bushfire risks to people and the environment through the introduction of the following potential bushfire ignition sources into the landscape, including:

- Heavy plant including bulldozers, excavators and vegetation removal machinery using slashers and mulching machines that may produce sparks when steel blades encounter rock, with the potential to ignite surrounding vegetation
- Sparks from vehicle exhaust that could ignite cured vegetation
- Hot works such as welding and grinding that can produce sparks resulting in significant risk of ignition for cured vegetation
- Electrical equipment faults that may result in some risk of ignition of vegetation. These risks are managed through electrical design, operation and maintenance in accordance with relevant Australian Standards and appropriate industry practice
- Inappropriate storage of chemicals that has the potential to cause a chemical fire or explosion. Failure to clean up a spill may also lead to fire. These risks are managed through storage and use of chemicals in accordance with industry-standard procedures.

It is crucial to note that there is no data suggesting that solar farms have been a source of bushfire ignition in Australia to date. With application of the conservative APZs outlined in the below section and detailed in **Appendix N (Bushfire Threat Assessment)**, the risk of the Project posing an additional bushfire risk to people and the environment in the surrounding area will be severely mitigated.

Asset protection zones

APZs are fuel-reduced areas surrounding built structures that provide a buffer zone between a bushfire hazard and the built structure. APZs will be established during the construction phase of the Project to reduce the risk of fire spreading from construction areas and the accommodation camp, as well as minimising the risk of bushfire impacting these facilities.

To manage operational impacts related to bushfires, APZs will be established around built structures according to the bushfire prone rating of the surrounding land as follows:

- Category 1: 100 m buffer
- Category 2: 25 m buffer
- Category 3: 30 m buffer.

These distances exceed the minimum requirements for solar farms specified in section 8.3.5 of Planning for Bushfire Protection 2019 (NSW RFS, 2019).

There is currently limited data on the impact of wildfires on solar farms, primarily due to the industry's relatively recent emergence and the lack of comprehensive reporting or literature on the effects of bush and grass fires on existing solar infrastructure. Grassland fires tend to spread rapidly but have much shorter residence times compared to forest fires, as they consume most of their fuel almost immediately. In contrast, forest fires burn hotter and longer, producing more embers that can travel further and increase the risk of secondary ignitions. This uncertainty reinforces the importance of:

- Implementing appropriately conservative Asset Protection Zones (APZs) greater than the minimum 10 m standard setback defined in Planning for Bushfire Protection (NSW RFS, 2019)
- A well-developed Bushfire Emergency Management & Operations Plan (BEMOP)
- On-site first-response firefighting capabilities
- Access to reliable water supplies to effectively manage bushfire risk and keep it within acceptable levels.

The Project infrastructure will also be designed to minimise the risk of damage from a fire.

The single axis tracking frames affixing the solar panels to the ground will be of heavy duty steel construction and are likely to be highly resistant to bushfire attack, with typical industry standard panels designed for extended operation in the field. The only vegetation underneath the solar array and within the Development Footprint overall will be grassland that is maintained to the required APZ standard, effectively ‘managed land’.

The substations will use well established APZs and will be surrounded by gravel hardstand to aid construction and servicing. The BESS will similarly be surrounded by the substation to the west; the solar arrays to the west, north and east; and the Elong Elong Energy Hub to the east and south. The current design effectively provides setbacks of a minimum of 32 m up to 250 m that will be managed land maintained to APZ standards or higher. The nearest retained bushland to the BESS is 32 m away from the southeast edge of the BESS site. This is an isolated 3.9 ha section of retained woodland that will not pose an unacceptable risk of bushfire damage to Project infrastructure due to the topography of the retained woodland (i.e. is located upslope from Project infrastructure).

This layout around the BESS and substation will provide very significant protection against any potential fire escape into the bushland should there be an ignition in the substation or BESS, and provide substantial areas to locate water supplies, for firefighting operations and for access. Additionally, the transmission lines extending from the substations to the high voltage grid connection point at the Elong Elong Energy Hub will be maintained to APZ standards.

As such, the Project will offer a high level of protection against the spread of a bushfire that may occur on-site to surrounding areas, and against the risk of damage to critical Project infrastructure.

6.12.5 Mitigation and management measures

Management and mitigation measures that will be implemented for the Project to address potential bushfire hazards and risks are listed in **Table 6-74**.

Most bushfire hazards and risks identified in the above assessment can be avoided or mitigated by employing a combination of standard measures in accordance with relevant guidelines and standards. A likely list of those that will be considered is provided in **Appendix N (Bushfire Threat Assessment)**.

Table 6-74 Management and mitigation measures – bushfire

ID	Management and mitigation measure	Timing
BF1	Fire protection at the BESS will be determined during detailed design and in consultation with FRNSW and RFS	Detailed design
BF2	The Development Footprint will be progressively managed in accordance with NSW Rural Fire Service's Standards for Asset Protection Zones (APZ) and Appendix 4 of 'Planning for Bushfire Protection 2019'.	Construction and Operation
BF3	Vulnerable buildings and/or critical assets will be constructed in accordance with 'Planning for Bushfire Protection 2019' and AS3959.	Detailed design and Construction
BF4	All internal tracks and trails are to be constructed and maintained to a minimum standard suitable for Category 1 Tanker operation per the RFS NSW Fire Trail Standards (2023).	Detailed design and Construction
BF5	A Fire Safety Study (FSS) will be prepared in accordance with HIPAP No. 2 Fire Safety Study Guidelines (DoP, 2011) in consultation with FRNSW. The FSS will determine the requirements for any fire safety systems (e.g. provision of fire water tanks and hydrant booster sets) on site during construction and operation.	Detailed design
BF6	A Bushfire Emergency Management and Operations Plan (BEMOP) is to be developed prior to the commencement of construction/operation and in consultation with local emergency services. This is to include a Bushfire Emergency Response Plan (BERP) sub-plan and a site specific pre-incident plan (PIP). The bushfire evacuation procedures within the BEMOP will be prepared in accordance with the *Guide to Developing A Bushfire Emergency Management Plan* (NSW RFS, 2014).	Construction and Operation

6.13 Social and economic

6.13.1 Secretary's Environmental Assessment Requirements

Table 6-75 sets out the SEARs relevant to social and economic impacts and where the requirements have been addressed in this EIS.

Table 6-75 SEARs – Social and economic

Relevant SEARs	
Social and economic	**Where addressed**
The EIS must address the following specific matters: • including an assessment of the social impacts or benefits of the project for the region and the State as a whole in accordance with Social Impact Assessment Guideline (DPE, 2023) including consideration of any increase in demand for community infrastructure services, consideration of construction workforce accommodation and consideration of potential opportunities for nearby settlements.	Social impacts and benefits are addressed in **Section 6.13.4, and Appendix J (Social Impact Assessment)**.
• including an assessment of the economic impacts or benefits of the project for the region and the State as a whole and provide details of any proposed voluntary benefit sharing programs in accordance with the Solar Guideline.	Economic impacts and benefits are addressed in **Section 6.13.5**.

6.13.2 Methodology

A Social Impact Assessment (SIA) has been prepared to assess the impacts of the project in accordance with the *Social Impact Assessment Guideline for State Significant Projects* (DPIE, 2023) (SIA Guideline). Refer to **Appendix J (Social Impact Assessment)** for further detail.

The SIA has been prepared to understand the social environment and context within and around the Project's social locality, and to consider its impacts in a broad, inclusive, and culturally sensitive manner. In doing so, the requirements of the SIA Guideline have been closely integrated throughout. The main phases and components of the assessment included:

- **Phase 1 – Scoping and initial assessment**:
  - Defining the social locality of the Project and gaining an understanding of the characteristics of the communities within
  - Undertaking an initial scoping assessment to identify the key social impacts to be considered in the SIA, and the level to which these need to be assessed. Social impacts not relevant to the Project were scoped out at this stage.
- **Phase 2 – Social impact assessment**:
  - Development of a social baseline study to understand the social context of the area without the Project
  - Predicting and analysing potential social impacts and benefits of the Project, informed by consultation and other technical assessments
  - Development of mitigation measures to address adverse social impacts, as well as to enhance identified social benefits.

The social impact assessment has considered the varying demographics, cultural and social groups that exist within the social locality, and has been informed by background research and consultation undertaken for the Project. The potential for different groups to experience different impacts has been considered throughout.

At the scoping stage the potential interest in the social impact of the Project was considered. Noting the isolated, rural nature of the Project Area and the relatively low likelihood of substantial adverse social impacts, no SIA-specific consultation was deemed necessary. However, general consultation with

relevant stakeholders and the community was undertaken by the Proponent (**Chapter 5.0 Stakeholder and community engagement**).

Evaluation of the significance of social impacts

The likelihood and magnitude of each potential impact was determined with reference to the SIA Guideline, and the assessment matrix in **Table 6-76**. In determining the magnitude of potential impacts, the dimensions of social impact (i.e. extent, duration, severity or scale, sensitivity or importance, level of concern/interest) were taken into consideration.

Table 6-76 Social impact significance matrix (DPIE, 2023)

		Magnitude level				
		Minimal	**Minor**	**Moderate**	**Major**	**Transformational**
Likelihood	**Almost certain**	Low	Medium	High	Very High	Very High
	Likely	Low	Medium	High	High	Very High
	Possible	Low	Medium	Medium	High	High
	Unlikely	Low	Low	Medium	Medium	High
	Very unlikely	Low	Low	Low	Medium	Medium

Social locality

The study area, hereafter referred to as the 'social locality' in line with the SIA Guideline, was developed with view to the likely direct and indirect areas of influence associated with the construction and operation of the Project.

To allow the assessment to encompass the communities surrounding the Project at a reasonable scale, the social locality has been identified at the level of Australian Bureau of Statistics (ABS) Statistical Area Level 2 (SA2), as shown on **Figure 6-27**:

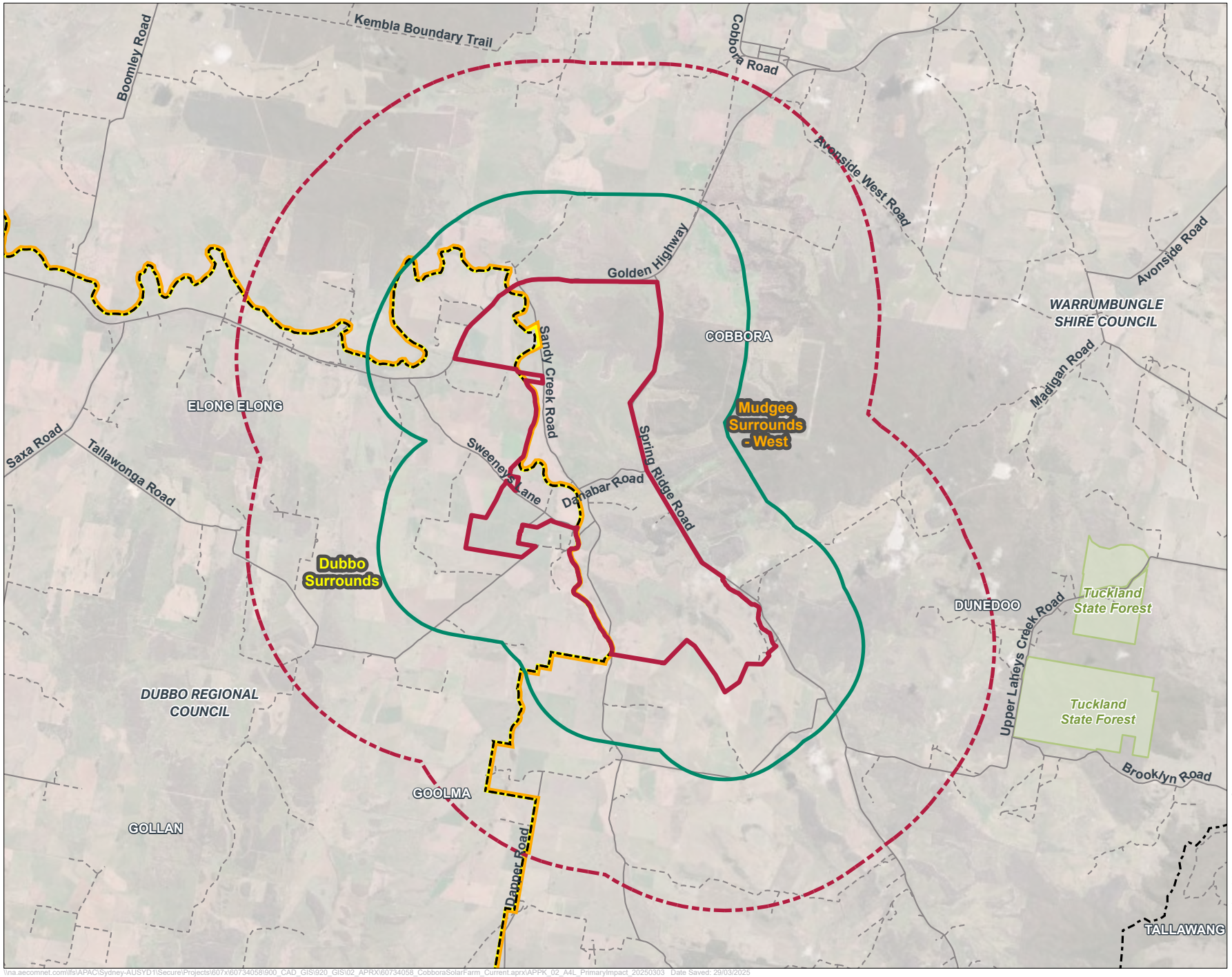
- Mudgee Surrounds – West SA2
- Dubbo Surrounds – SA2.

Despite the defined social locality, information related to social infrastructure has been collated from within a five kilometre radius of the Project only. This is due to the limited amenity impacts (such as noise, traffic and air quality) that the Project will have on social infrastructure surrounding the Project. Additionally, as the majority of construction workers will be bussed into the Site which will be entirely self-sufficient and the roads upgraded around the Project are restricted to the immediate surrounds of the Project, it is unlikely that social infrastructure beyond 5 kilometres will be affected by changes which arise due to the construction or operation of the Project.

To enable a comparison between the social locality and other relevant areas, the data from the above SA2s has been compared to Dubbo SA3 and NSW.

Noting the potential for multiple and/or overlapping impacts, this assessment has considered the following sub-categories of the social locality:

- **Primary impact area**: area within the immediate vicinity of the Project Area. This area will be most likely to experience acute and/or multiple impacts
- **Secondary impact area**: this encompasses the rest of the social locality where people living or working within this area are expected to experience a minor to moderate level of social impact.



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0 1 2 km

Legend

- Project Area
- Primary Impact Area
- Secondary Impact Area
- LGA Boundary
- Dubbo surrounds SA2
- Mudgee surrounds - west SA2
- State Forest
- Road
- Vehicular Track

FIGURE 6-27: SOCIAL LOCALITY - PRIMARY IMPACT AREA

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Source: Earthstar Geographics

6.13.3 Existing environment

The following section provides a description of the existing environment within the social locality.

Strategic framework and social policy

The Project is broadly consistent with a number of Australian and NSW strategic plans for increasing the contribution of renewable energy to the NEM (**Chapter 2.0 Strategic context**). The Project is also consistent with the following Community Strategic Plans (CSP) for Warrumbungle Shire Council and Dubbo Council:

- Towards 2040 – Dubbo Community Strategic Plan
- Warrumbungle Shire Council Community Strategic Plan 2022/2037.

Social profile

Key demographic data

Key demographic indicators relevant to the Project has been derived from ABS census data (ABS, 2021a) and are provided in **Appendix J (Social Impact Assessment)**.

Due to the rural nature of the Project and the lack of detailed data for the townships nearby the Project, data was collected for Mudgee-Surrounds West and Dubbo Surrounds SA2, both of which overlap the Project Area.

Socio-Economic Indices for Areas

The Socio-Economic Index for Areas (SEIFA) (ABS, 2021b) is produced by the ABS as an indicator of relative socio-economic advantage and disadvantage, being people's access to material and social resources, and their ability to participate in society. SEIFA aids in providing an assessment of the welfare of Australian communities and helps in determining and prioritising areas that require funding and services.

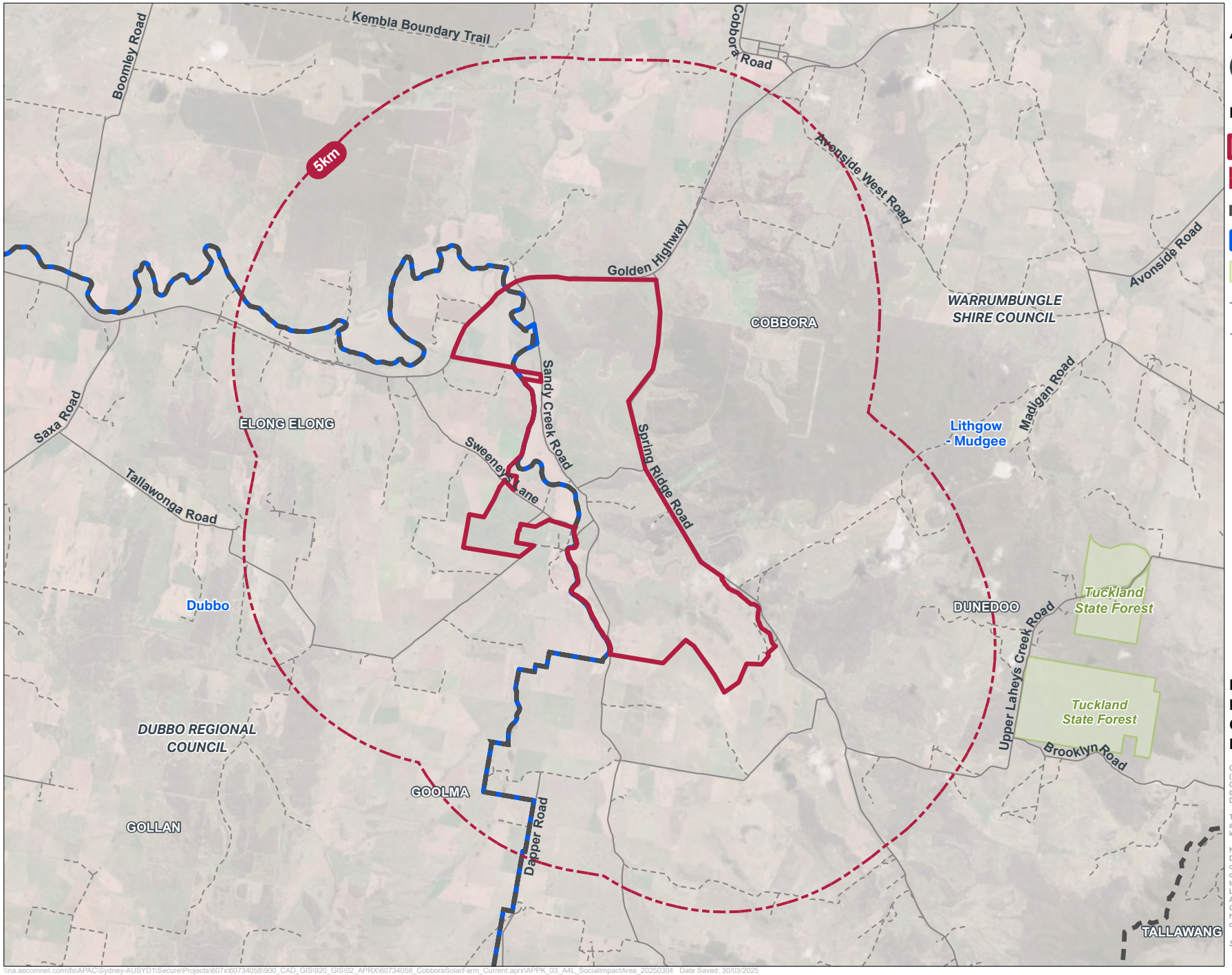
The SEIFA publication consists of four indexes, of which, the Index of Relative Socio-economic Advantage and Disadvantage (IRSAD) and the Index of Economic Resources (IER) have been used for this assessment. Results of these data sets for both LGAs are as follows:

- Index of Relative Socio-economic Advantage and Disadvantage
    - **Dubbo Regional**: a decile of six for both Australian and NSW State rankings, indicating that 40% of LGAs within NSW and Australia are more disadvantaged
    - **Warrumbungle Shire**: a decile of three for both Australian and NSW State rankings, indicating that 70% of LGAs within NSW and Australia are more disadvantaged
- Index of Economic Resources
    - **Dubbo Regional**: a decile of three for the LGAs ranking within Australia and a decile of two for the NSW State rankings, indicating that 70% of LGAs within Australia and 80% of LGAs within NSW have greater levels of economic resources
    - **Warrumbungle Shire**: a decile of six for both Australian and NSW State rankings, indicating that 40% of LGAs within NSW and Australia have greater levels of economic resources.

Social infrastructure

Social infrastructure comprises social services or facilities that are used for the physical, social, cultural or intellectual development or welfare of the community, such as educational facilities, hospital and medical facilities, sporting and recreational facilities, community halls, libraries, services, activities, open space and sporting fields.

The only social infrastructure within a 5 km radius of the Project is Tuckland State Forest, as shown on **Figure 6-28**.



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0 1 2 km

Legend

- Project Area
- 5 km Buffer from Project Area
- LGA boundary
- SA3 Outline
- State Forest
- Road
- Vehicular track

FIGURE 6-28: SOCIAL INFRASTRUCTURE IN CONSIDERATION OF SOCIAL IMPACT

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Source: Earthstar Geographics

Aboriginal culture and values

The Project is located on the eastern boundary of the Wiradjuri tribe and is of high cultural importance to the local Aboriginal people, notably the convergence of Sandy Creek and Laheys Creek (refer to **Section 6.3** for further information).

Economic characteristics

The Project Area is located in Central West NSW, the nearest local business centres are Dunedoo (approximately 20 kilometres northeast of the Project) and Dubbo (approximately 55 kilometres west of the Project). Dubbo serves as the largest employment and population centre in the region.

The largest industry of employment for the region is agriculture, forestry and fishing and an analysis of housing affordability determined that there are less people who identify as paying greater than 30% of their household income on mortgage or rent than NSW.

Access and connectivity

The road network connecting the Project Area to the region includes Spring Ridge Road, Golden Highway, Danabar Road, Sandy Creek Road, Sweeneys Lane, and Tallawonga Road. The largest and busiest roads in the vicinity of the Project and connects Dubbo in the west and Newcastle in the east.

There are limited public transport services in the locality. One school coach service from Dunedoo to Dubbo in the morning and Dubbo to Dunedoo in the evening. Outside of these services, no other public transport service operates. There is a freight rail line which runs parallel to the Golden Highway; however, no public rail services operate on the line.

No formal pedestrian or cycling facilities exist in the vicinity of the Project Area (refer to **Section 6.8** for further information).

Construction workforce and industry

A total of 732 persons indicated that they worked in the construction industry according to the 2021 Census. This indicated that although there was a presence of existing skills, it is unlikely that this will be enough to cover the required workers for this Project.

6.13.4 Social impact assessment

Construction

A summary of the construction social and economic impact assessment is shown in **Table 6-77**.

Table 6-77 Construction social impact assessment

Impact	Impact Summary
Way of life	
Changes to how people move around	Temporary disruptions to the way that the community access key locations (such as work, local shops, recreation facilities, community facilities) may occur due to construction. Due to the remote nature of the Project, it is unlikely that there will be disruption to the way that community members access the aforementioned facilities. The major road located in close proximity to the Project, the Golden Highway, will remain open at all times, ensuring connections within the region are maintained. As outlined in **Appendix H (Traffic and Transport Impact Assessment)**, construction of the Project will increase the traffic on the Golden Highway (due to staff, materials and equipment being brought to the Project Area). However, as noted in the TTIA it is unlikely that this will have a noticeable impact on traffic as the highway is built for high traffic volumes and has existing capacity. Overall, the magnitude potential of potential impact the transport network which connects the region is considered to be minor and unlikely to impact receptors. As such, the overall impact has been determined as a **low** (negative).

Impact	Impact Summary
Property impacts	The Project Area is located over multiple lots. In the northern portion of the Project Area, there are four dilapidated dwellings which will be demolished. In the southern portion of the Project Area, there is a house, large sheds and cattle yards. No property acquisition is required for the Project. There is an option for lease agreement with the two associated landowners which will be exercised at financial close, once all approvals are in place. Consultation with landowners has occurred. Overall, the magnitude potential of potential impact properties is considered to be minimal and unlikely to present social impacts. As such, the overall impact has been determined to be **low** (negative).
Access to accommodation	As construction workers require accommodation whilst working on large-scale projects, there is a chance for this to impact the housing market and overall access to accommodation in the area. The Project is expected to have 734 full time equivalent (FTE) employees during the peak of construction. Workers who are not local will be able to stay in a purpose-built accommodation facility on-site. Overall, the magnitude potential of potential impact properties is considered to be minimal and very unlikely to impact community members. As such, the overall impact has been determined to be **low** (negative).
Community	
Demographics and community composition	Construction of the Project has the potential to influence the composition of the community, through the potential inward migration of the construction workforce. A large number of construction workers is required for the project (732 FTE at peak) which will increase the population of each area (Mudgee-Surrounds West and Dubbo Surrounds SA2) noticeably. This increased population may cause a potential conflict to the community if these workers are unaware of or ignore existing community values. Overall, the magnitude of potential impact to properties is considered to be moderate and possible to impact community members. As such, the overall impact has been determined to be **medium** (negative).
Social cohesion and sense of the place	Construction of the Project may affect social cohesion as physical or psychological barriers can be created between communities. It is unlikely that the Project will create changes to access for residents due to the remote nature of the Project. It is located approximately 7 km from the nearest township and the Project will not be closing off any roads. In addition, construction of the Project is unlikely to create ay psychological barriers for people who live in the local area. Overall, the magnitude of impact to social cohesion and sense of place for residents is considered to be minor and unlikely. As such, the overall impact has been determined to be **low** (negative).
Accessibility	
Access to infrastructure, services and facilities	Construction of large-scale projects has the ability to alter access to infrastructure, services and facilities for the wider community. The Project is not proposing any changes to access arrangements within the social locality as road closures are not required. Additionally, as there are no formal or informal pedestrian crossings or cycle paths in the area it is unlikely

Impact	Impact Summary
	the Project will impact other ways for the community to access key facilities. Parking will be provided on-site to workers which will not impact access for residents along key roads. Additionally, accessibility for residents to local health services and basic supplies at supermarkets will not be affected as the Project will be self-sufficient. Workers will be housed at an accommodation camp and catering and on-site health facilities will be provided. The provision of a first aid station with an onsite nurse has been included in the workers accommodation to reduce pressure on local health service providers Overall, the magnitude of impact to accessibility for residents is considered to be minor and unlikely resulting in a **low** (negative) overall impact.
Health and wellbeing	
Community health and wellbeing	Construction activities have the potential to influence physical and mental health of communities affected by a Project. Construction of the Project will result in minor impacts that may affect health and wellbeing such as noise and vibration, traffic, dust. However, these impacts are not expected to be of a scale that can directly affect health and wellbeing especially when compared to the existing dust, traffic and noise generated by the Golden Highway. The Project will be self-sufficient. The provision of a first aid station with an onsite nurse has been included in the workers accommodation to reduce pressure on local health service providers, minimising the impact to community health services. Overall, the magnitude of impact to community health and wellbeing is considered to be very minor and unlikely, resulting in a **low** (negative) overall impact.
Surroundings	
Local amenity	Construction activity has the potential to affect the amenity of a place for a community. Impacts on amenity may include factors such as traffic, changes to viewpoints, changes to air quality, noise, vibration. The impacts to traffic and access as a result of the construction of the Project will likely be minimal. Similarly, changes to air quality will be minimal as works will be short-term and localised to the Project Area. There are up to seven residential receivers which have been modelled to experience noise levels above the noise management level during a worst-case construction scenario, being intermittent and generally centralised in the Project Area (further from receivers) than has been modelled. There are no vibration impacts anticipated for receivers during construction of the Project. Impacts due to changes to visual impact will occur from the presence of the Project construction area. It is likely that these visual impacts will be limited to motorists travelling along roads close to the Project. Overall, there will be generally localised changes to local amenity due to construction of the Project. The magnitude of impact is considered minor, and the likelihood of these impacts is possible. As such, the overall impact on local amenity has been determined to be **medium** (negative).
Crime, safety and security	The presence of construction sites, construction workforce and increase in construction traffic may result in changes to perceptions of safety in an area.

Impact	Impact Summary
	However, due to the location of the Project (away from large urban centres/townships) and the use of centralised construction workers accommodation the potential for increases in crime (real or perceived) is considered to be low. Overall, the magnitude of impact on construction of the Project on crime, safety and security is minimal and the likelihood of construction changing the security of the surrounding area is unlikely. As such, the overall impact has been determined to be **low** (negative).
Livelihoods	
Economic	Construction activity can benefit the local economy with associated economic stimulus from increased expenditure at local businesses through purchases made by construction workers, and indirect employment and expenditure through the provision of goods and services required for construction. The Project will require approximately 734 FTE staff (during peak times) who will fly in via Dubbo airport on a fortnightly basis. This is likely to generate economic benefits for the region such as for cafes and other hospitality businesses, as well as local transport companies. The overall magnitude of economic benefits during construction in the social locality will be considered minor, given that the benefits will likely be dispersed across the broader region. The likelihood of these impacts being experienced within the social locality will be unlikely, resulting in a **low (positive)** impact. The Proponent is committed to a benefit sharing agreement, to be developed and implemented in accordance with the Benefit-Sharing Guideline (DPHI, 2024a).This is discussed further in **Section 6.13.5**.
Business	Construction has the potential to affect businesses within the area, due to the influx of construction workers and the replacement of pre-existing farming businesses within the Project Area. There will be a need for a large construction workforce (734 FTE employees at the peak and 390 FTE during other times), which is likely to result in indirect benefits for local businesses in the area, such as through hospitality venues in local towns (e.g. Dunedoo, Dubbo and Wellington). There will also be benefits to local businesses who specialise in activities required for construction such as fencing and tree removal. The impact of construction on local businesses will be moderate due to the large number of workers coming into the region and it is likely that this impact will occur. As such, the overall impact has been determined to be **high (positive)**.
Culture	
Aboriginal culture and heritage	Construction of the Project has the ability to affect areas or items with high cultural significance to local Aboriginal people. In total, 137 registered Aboriginal sites were recorded within the Project Area. Construction of the Project will result in the loss (completely or partially) of 22 sites, of which 20 were assessed as being of low scientific significance, one being of moderate scientific significance and one being of high scientific significance. Consultation with the Aboriginal community was undertaken and, based on the findings, appropriate mitigation measures are proposed which are supported by Aboriginal community representatives.

Impact	Impact Summary
	Although impacts to Aboriginal sites are proposed, due to the overall large number of cultural heritage values within the Project Area the magnitude of the impact for construction is considered to be moderate and possible. As such, the overall impact has been determined to be **medium** (negative).
Non-Aboriginal heritage	There are no historic items of heritage significance within the Project Area. No impacts are proposed to historic heritage items during construction of the Project.
Cumulative Impacts	
Cumulative Impacts	During construction, there is potential for multiple Projects being constructed at the same time to impact the social locality. The Projects that were assessed as being nearby to the Project and potentially causing cumulative impacts during construction were the Spicers Creek Wind Farm, Sandy Creek Solar Farm, Tallawang Solar Farm, Birriwa Solar Farm and Elong Elong Energy Hub. Multiple cumulative impacts may apply which include: • Noise and vibration generated from all Projects potentially being in construction concurrently • Air quality from construction related activities occurring simultaneously • Visual impacts as a result of construction hoarding from multiple Projects • Traffic impacts from construction for other Projects • Livelihood impacts from nearby Project opportunities for local businesses • Construction fatigue from multiple Projects being constructed at once and the potential consecutive nature of these impacts Overall, it is possible that these impacts could occur and moderately impact the social locality, leading to an overall **medium** significance (negative).

Operation

A summary of the operation social and economic impact assessment is shown in **Table 6-78**.

Table 6-78 Operation social impact assessment

Impact	Impact Summary
Way of life	
Changes to how people move around	Amenity impacts arising from the operation of the Project will be minimal, given the low number of operational workers, and very low vehicle movements. Limited staff will be required to operate the Project, and it is the Proponent's intention to source these staff locally. Given this and the Project's location, it is likely that the operation of the Project will not affect the way that residents move around their community or access social infrastructure. As identified in **Appendix H (Traffic and Transport Impact Assessment)**, the local roads including the Golden Highway and Spring Ridge Road have been identified as having the capacity required for this Project. Based on the nature of the above impacts, the magnitude of impact is considered to be minor. The likelihood of the receptors being affected by the impact are considered to be unlikely. As such the overall impact will be **low** (negative).
Utilities and digital access	The Project will directly contribute to supporting the National Electricity Market. The Project will increase electricity supply reliability and thereby supporting a more stable electricity market and energy affordability, with greater capacity for renewable energy storage and input into the grid. When operational, the

Impact	Impact Summary
	Project will produce 700 megawatts (AC) of energy, enough to power 280,000 homes. Based on the nature of utilities and digital access, the magnitude of impact is considered to be major. The likelihood of the receptors being affected by the impact are considered to be almost certain. As such the overall impact will be **very high** (positive).
Surroundings	
Local amenity	Traffic impacts associated with the Project are expected to be negligible during the operational phase. The Project will require 20 full-time workers and internal roads and a carpark within the Project Area will be available for workers. As such the Project will not result in noticeable traffic generation or local parking impacts. Assessment of noise impacts associated with operation are presented in **Appendix I (Noise and Vibration Assessment)**. The assessment found that the Project was compliant with required operational noise criteria, with the noise generated from the Project being negligible for nearby sensitive receivers. The Project will not result in vibration impacts during the operational phase of the Project. There will be no air quality impacts from the Project during the typical operation of the Project. Maintenance activities that may lead to airborne dust or other emissions, will be appropriately managed by the proposed mitigation measures. A key environmental benefit of the Project is the generation of electricity without the emissions of greenhouse gases that will otherwise be generated from alternative non-renewable power generation options. The reduction in greenhouse gas emissions will have a positive impact on regional air quality and climate change. During operation, the Project will alter visual amenity of the locality, including through the presence of solar infrastructure, night lighting, and potential glint and glare impact to Spring Ridge Road and the Golden Highway. All non-associated dwellings within 4 km were assessed as having a low-visual impact rating from the Project. Overall, the existing landscape within the Study Area has the ability to absorb the Project with a low degree of visual impact. Based on the visual impacts, the magnitude of impact is considered to be minor. The likelihood of the receptors being affected by the impact are considered to be likely. As such the overall impact will be **medium** (negative).
Crime, safety and security	The Project will be located away from prominent public areas. The Project Area will be adequately secured, including security lighting, and will be designed with consideration of Crime Prevention Through Environmental Design (CPTED) principles. This will support safety and security in areas with a public interface. The magnitude of impact will be minimal. Given the nature of the Project, with limited security-related risks, adverse impacts to crime, or a deterioration in security in the community is considered unlikely to occur. The overall impact will be **low** (negative).
Livelihoods	
Economic	The NSW Government has supported businesses and the local economy in diversifying from a reliance on coal-fired generators, as detailed in the Central West and Orana Regional Plan 2041 (DPE, 2022). The Project presents an opportunity to further diversify local industries and enhance the resilience of

Impact	Impact Summary
	the economy by promoting new renewable projects across the CWO REZ and the (NEM) more broadly. As outlined in **Appendix P (Soil, Land and Agriculture Impact Assessment)**, the Project will reduce primary productivity of agricultural businesses in the areas by up to $291,732 annually (approximately). This is representative of 0.1% of the industry gross value for Dubbo Regional LGA and Warrumbungle Shire LGA respectively. Whilst this is a small impact to agricultural businesses nearby, the Project will be generating economic benefits for the LGAs, primarily through several key drivers, including: • Supporting and securing the National Electricity Market • Bolstering the Renewable Energy Zone • Creating 20 new jobs. While the overall magnitude of economic benefits within the social locality is considered minor due to the likely dispersion of benefits across the broader region. The potential for these impacts to be experienced locally will be possible, resulting in a **medium** (positive) impact. A community shared benefit strategy will be developed to ensure proceeds of the Project are distributed between proponent and the community. This is discussed further in **Section 6.13.5**.
Business	The Proponent will look to source employees locally for operational roles for the Project. The introduction of these jobs will positively influence the local community's capacity to earn an income in the area. The Proponent is also maintaining a level of agricultural activities on the site through sheep that will be grazing. Based on the nature of the above impacts, the magnitude of impact is considered to be moderate. The likelihood of the receptors being affected by the impact are considered to be possible. As such the overall impact will be **medium** (positive).
Cultural	
Aboriginal heritage	There are no anticipated impacts to Aboriginal heritage associated with the operation of the Project. Impacts to Aboriginal heritage and values are considered to be a minimal magnitude and very unlikely in terms of likelihood. As such the overall impact will be **low** (negative).
Non-Aboriginal heritage	There are no anticipated impacts to non-Aboriginal heritage associated with the operation of the Project. The likelihood of negative impacts to non-Aboriginal heritage and values is considered to be a minimal magnitude and will be very unlikely. As such the overall impact will be **low** (negative).
Cumulative Impacts	
Cumulative Impacts	Due to the large number of Projects within the area, there is a chance that the Project my impact the community. Although the Project will reduce greenhouse gas emissions, there may be cumulative impacts to traffic and transport (due to the amount of Projects in the region), visual (due to the location of neighbouring solar farms, wind farms and the Elong Elong Energy Hub) and noise (due to the cumulative operation of these Projects).

Impact	Impact Summary
	The likelihood of impacts due to cumulative impacts Is considered to be moderate and possible. As such the overall impact will be **medium** (negative).

6.13.5 Economic assessment

Benefit-sharing strategy

The Proponent is committed to a Community Shared Benefit Strategy (CSBS), to be developed and implemented in accordance with the Benefit-Sharing Guideline (DPHI, 2024a). The agreement will be developed in collaboration with the local community, Warrumbungle Shire Council and Dubbo Regional Council. These discussions are ongoing at the time of EIS lodgement. Total funding for benefit-sharing will be $850 per megawatt per annum based on installed capacity and paid over the operating life of the development and indexed to the Consumer Price Index.

Construction

The Project will involve approximately $1.38 billion in capital investment. Major investment costs are associated with the purchase of PV panels and associated equipment, battery storage components, and civil, electrical and grid connection works.

The construction of the Project will create investments in local and regional economies, as well as flow-on benefits to local businesses and the local community, through direct and indirect employment and expenditure. This includes:

- Direct employment: 734 FTE employees at the peak and 390 FTE during other times. Approximately 80% of the workforce are anticipated to be sourced from NSW, with targeted measures to maximise local employment and sourcing from local communities such as training, up-skilling and capacity building support, in collaboration with local stakeholders and training providers.
- Indirect employment: In addition to direct employment, employment will be generated indirectly in other related sectors (e.g., manufacturing, distribution, transportation, training, IT)
- Direct expenditure: There will be benefits to local businesses who specialise in activities required for construction such as earthworks, transport, logistics, security, waste management, landscaping, and fencing businesses.
- Indirect expenditure: Construction activity can benefit the local economy with associated economic stimulus from increased expenditure at local businesses through purchases made by construction workers. Although the workforce will be housed in an accommodation camp (to minimise pressure on local housing supply), there is likely to be some movement by workers between the accommodation camp and nearby urban centres. This will likely indirectly assist local businesses in the area in particular after work hours and on weekends, in hospitality venues in local towns such as Dunedoo, Dubbo and Wellington, as well as retail, recreation, and other personal expenses.

Potential economic impacts associated with agricultural productivity during construction are discussed in **Section 6.5**. The assessment assumed that the entire Development Footprint will cease to be used for agriculture, resulting in an estimated reduction of primary productivity of up to $516,329 per annum. This lost agricultural productivity per year is considered a negligible impact in the context of the agricultural industry gross value of the Dubbo Regional LGA and Warrumbungle LGA, representing around 0.3% for each.

The Proponent has committed to providing economic benefits during construction for the community, the region and the NSW as a whole. This commitment takes the form of:

- Investment in the local supply chain (Australia-wide, however it is anticipated that the majority will occur in NSW), valued at:
  - Approximately 40-49% of the solar-related capital expenditure (CAPEX)
  - Approximately 23% of the BESS-related CAPEX.

- Workforce participation goals, such as:
  - The total solar construction workforce (up to 3 years) to include approximately 12% learning workers, 4% apprentices, 15% underrepresented groups, and 4% First Nations participation
  - the total BESS construction workforce (up to 2 years) to include approximately 12% learning workers, 3.6% apprentices, 15% underrepresented groups, and 3.4% First Nations participation.
- Implementing subcontract conditions to include local content contractual requirements, and requirements for subcontractors tendering for larger packages of work to undertake a Local Benefits Test
- Monitoring the status of committed versus actual Local Content outcomes
- Implementing a national Aboriginal and Torres Strait Islander business register, and developing and sustain localised community/state partnerships with a diverse range of Aboriginal and Torres Strait Islander organisations.

Operation

Once operational, the Project will require 20 FTE workers, which will be preferentially sourced locally, where feasible. Permanent operational roles will contribute to reducing unemployment and diversifying the local job market, offering new career pathways and promoting economic resilience in the area.

The Proponent has committed to providing economic benefits to the community, the region and NSW as a whole. This commitment takes the form of:

- Investment in the local supply chain, (Australia-wide, however it is anticipated that the majority will occur in NSW), valued at:
  - Approximately 70-80% of the solar-related operational expenditure (OPEX)
  - Approximately 35% of the BESS-related OPEX.

Potential economic impacts associated with agricultural productivity during operation are discussed in **Section 6.5**. The impact of the Project on productivity of agricultural land during operation is estimated to be $291,732 per year based on the following conservative assumptions. This is considered a negligible impact in the context of the gross value of the agricultural industry in the Dubbo Regional LGA and Warrumbungle LGA, representing 0.1% of each. This will be partially offset by agricultural activities that will carry on within the land in accordance with the Agrisolar Grazing Strategy (refer to Appendix 4 of **Appendix P (Soils, Land and Agriculture Impact Assessment)**).

6.13.6 Management and mitigation measures

Management and mitigation measures to avoid, minimise, or manage potential social and economic impacts as a result of the Project are detailed in **Table 6-79**.

The management of other environmental impacts (such as noise and vibration, traffic and other amenity-related impacts) will contribute to the management of social impacts, due to their interrelated nature. Other mitigation measures identified in the EIS which are relevant to the management of potential social impacts can be found in **Appendix E (Compilation of Mitigation Measures)**.

Table 6-79 Management and mitigation measures – social and economic

ID	Management and mitigation measure	Timing
SE1	A Community and Stakeholder Engagement Plan will be prepared to foster consistent, transparent and proactive consultation with nearby and adjacent landholders, local councils, the local Aboriginal community, Project RAPs and other key stakeholders. This will include: • methods for collaboration and coordination with relevant stakeholders in responding to community issues relating to REZ establishment	Construction, Operation and Decommissioning

ID	Management and mitigation measure	Timing
	• methods and timing for connecting with the community, and principles that will be applied to the engagement • guidance on communication protocols with nearby residents to share information and generate awareness about construction activities and potential periods of disruption, including a responsive and easy-to-access community grievance mechanism.	
SE2	An Aboriginal participation plan (APP) will be developed in consultation with First Nations stakeholders to optimise local capacity and aspirations through targeted participation initiatives within the regional area. The APP will sit under the Proponent's Industry and Aboriginal Participation Plan (IAPP). The IAPP will be contractually binding upon award of Access Rights. Agreed commitments will be measurable, and a report of progress to the local First Nations community will contribute to the measurement of outcomes.	Construction and Operation
SE3	An Accommodation, Employment and Procurement Strategy (AEPS) will be developed in consultation with Warrumbungle Shire Council and Dubbo Regional Council. The AEPS will include targeted measures to maximise local employment and sourcing from local communities such as training, up-skilling and capacity building support, in collaboration with local stakeholders and training providers.	Construction
SE4	The recruitment of local workers for the construction workforce will be maximised where possible.	Construction
SE5	In relation to health services, engagement with Dubbo Regional Council and Warrumbungle Shire Council will be undertaken to identify potential service limitations.	Construction
SE6	A Community Shared Benefit Strategy (CSBS) will be developed in collaboration with Warrumbungle Shire Council and Dubbo Regional Council in accordance with the Benefit-Sharing Guidelines (DPHI, 2024a).	Construction and Operation

6.14 Other issues

6.14.1 Waste management

Secretary's Environmental Assessment Requirements

Table 6-80 sets out the SEARs relevant to waste management and where the requirements have been addressed in this EIS.

Table 6-80 SEARs – Waste

Relevant SEARs	
Waste	**Where addressed**
The EIS must address the following specific matters: • identify, quantify and classify the likely waste streams to be generated throughout all stages of the project, and describe the measures to be implemented to reduce waste generation, manage, reuse, recycle and safely dispose of this waste (in consultation with waste facilities, including Council); and • provide a waste management plan prepared in accordance with the Solar Guideline.	This section identifies likely waste streams and management measures to provide a preliminary approach to the waste management plan. Consultation is discussed in **Chapter**

Relevant SEARs	
	5.0 Stakeholder and community engagement.

Methodology

A qualitative desktop assessment has been carried out to estimate waste types and quantities associated with the Project, identify potential impacts, and to identify appropriate mitigation and management measures. This involved:

- Identifying potential waste generating activities during construction, operation and decommissioning
- Estimating the likely waste streams with reference to the typical activities likely to be undertaken within each phase
- Identifying the likely classification of waste streams in accordance with relevant legislation and guidelines
- Describing how the project will seek to avoid waste generation in the first instance, followed by minimisation, reuse and then recycling and/or disposal, in that order
- Describing the management and handling techniques for key waste stream, including storage and collection.

Waste management framework

The *Protection of the Environment Operations Act 1997* (POEO Act) is the primary piece of legislation regulating waste management and recycling in NSW. The POEO Act establishes the procedures for environmental control, and for issuing environment protection licences (EPLs) covering issues such as waste.

Under the POEO Act 'waste' is defined as:

a. *"any substance (whether solid, liquid or gaseous) that is discharged, emitted or deposited in the environment in such volume, constituency or manner as to cause an alteration in the environment*

b. *any discarded, rejected, unwanted, surplus or abandoned substance*

c. *any otherwise discarded, rejected, unwanted, surplus or abandoned substance intended for sale or for recycling, processing, recovery or purification by a separate operation from that which produced the substance*

d. *any processed, recycled, reused or recovered substance produced wholly or partly from waste that is applied to land, or used as fuel, but only in the circumstances prescribed by the regulations*

e. *any substance prescribed by the regulations to be waste.*

A substance is not precluded from being waste for the purposes of this Act merely because it is or may be processed, recycled, re-used or recovered."

This broad definition under the POEO Act means that waste management is a key issue that affects numerous aspects of construction, operation and decommissioning of the Project.

The *Protection of the Environment Operations (Waste) Regulation 2014* (POEO Waste Regulation) regulates matters such as the obligations of consignors (producers and agents), transporters, and receivers of waste, in relation to waste transport licensing and tracking requirements within NSW.

The aim of the *Waste Avoidance and Resource Recovery Act 2001* (WARR Act) includes "*to encourage efficient use of resources, reduce environmental harm, and reduce waste generation in accordance with the principles of ecologically sustainable development.*" To meet the objectives of the Act, waste management options must be considered and selected in accordance with the following hierarchy:

- Avoidance of unnecessary resource consumption
- Recovery of resources (including reuse, reprocessing, recycling and energy recovery).

To support the waste management hierarchy, the NSW Waste Avoidance and Resource Recovery Strategy 2014 -21 (NSW EPA, 2014a) provides a framework and targets for waste management and recycling. Targets established under this strategy include:

- Avoiding and reducing the amount of waste generated per person in NSW
- Increasing recycling rates to 70% for municipal solid waste, 70% for commercial and industrial waste, and 80% for construction and demolition waste
- Increasing waste diverted from landfill to 75%
- Managing problem wastes better and establishing 86 drop-off facilities and services across NSW.

In NSW, waste is classified in accordance with the Waste Classification Guidelines 2014 (NSW EPA, 2014b) (the 'Waste Classification Guidelines'). Waste classification assists those involved in the generation, treatment and disposal of waste to appropriately manage the environmental and human health risks associated with their waste, in accordance with the POEO Act and its associated regulations. Many waste types are pre-classified under the POEO Act and do not require testing. However, if a waste is not pre-classified, it may need to be tested to determine its classification.

A detailed Waste Management Plan (WMP) will be prepared in accordance with the Solar Guidelines and will describe the measures implemented to manage, reuse, recycle, and safely dispose of waste generated by the Project. Key waste management principles identified in the Solar Guidelines to be integrated into this plan will include:

- *Construction waste must be minimised, and this waste should comprise as much reusable and recyclable material as possible*
- *Impacts on local waste management facilities must be minimised as far as practicable during construction, operation and decommissioning*
- *Recycling of photovoltaic panels and associated equipment should be prioritised and maximised as far as possible to avoid landfill*
- *Applicants should monitor technological and industry advancements over the life of the project should be undertaken and preference given to the most efficient and cost-effective recycling and recovery methods.*

Existing environment

There are two waste and recycling centres and eight waste transfer stations currently operating in Warrumbungle Shire and Dubbo Regional Council LGAs. The closest facility is the Dunedoo Waste Transfer Facility, approximately 20 km east of the Project Area. The accepted waste types relevant to the Project are as follows:

- Green waste
- Domestic waste
- Commercial waste
- Building and demolition waste
- Asbestos waste.

The two waste and recycling centres, Whylandra Waste and Recycling Centre and Coonabarabran Landfill, are located about 65 km east and 100 km north, respectively. Coonabarabran Landfill accepts all waste streams including asbestos. Whylandra Waste and Recycling Centre does not accept all

waste streams (prohibited waste is listed on the Dubbo Regional Council webpage). The Proponent will consult with local councils prior to the commencement of construction and decommissioning to identify suitable waste disposal locations across both LGAs.

There is also a large solar panel recycling business located in Parkes, NSW. If required, investigations into waste and recycling options in broader NSW will be undertaken to ensure there is capacity at facilities to support the Project.

Impact assessment

Construction

Construction of the Project has the potential to produce, but is not limited to, the following key waste streams:

- Excess spoil through site clearance activities and earthworks
- Vegetation from the removal of shrubs and trees
- Packaging materials associated with items, such as pallets, crates, cartons, plastics and wrapping materials
- Waste produced from the maintenance of construction equipment and machinery, including liquid wastes from cleaning, repairing and maintenance
- Waste produced from construction works including metal offcuts, excess concrete, excess cabling, broken panels and other material
- Sewage wastes generated through the use of worker's facilities and accommodation, such as toilets
- General office and domestic wastes, such as paper and food wastes.

A summary of the anticipated construction waste types and quantities is provided in **Table 6-81**, along with the likely waste classifications and the proposed handling, treatment and disposal methods.

Table 6-81 Potential construction waste types, classifications, approximate volumes and management methods

Waste type	NSW EPA Waste Classification	Approximate volume to be removed	Proposed handling, treatment and/or disposal method
Clean soil	General solid waste (non-putrescible)	No major cut and fill works are required. All material expected to be reused	Onsite re-use. Spoil may be stockpiled within the Development Footprint prior to re-use.
Contaminated soils	To be classified subject to results of testing	None expected (no potentially contaminative locations have been identified)	N/A. However, an unexpected finds procedure for handling and storing potentially contaminated material will be included in the SWMP.
Green waste	General solid waste (non-putrescible) (garden waste)	All material expected to be reused	Separated, some chipped and stored on-site for landscaping.
General construction waste	General solid waste (non-putrescible)	5,000 tonnes	Off-site recycling and disposal.
Fuels, lubricants and chemicals	Hazardous waste	14,000 L	Offsite disposal at a licenced facility
Sewage	Liquid waste	95,000 m^3	Septic system will be periodically emptied by a licensed contractor

Waste type	NSW EPA Waste Classification	Approximate volume to be removed	Proposed handling, treatment and/or disposal method
			and disposed of at an appropriately licensed facility.

Adverse waste outcomes that have the potential to occur during construction include:

- Clean spoil directed to landfill due to inadequate re-use and recycling
- Waste being unnecessarily directed to landfill due to inadequate handling classification
- Excess waste being generated from mismanagement of ordering quantities (i.e. over estimating)
- Contamination of soil, surface and/or groundwater from the inappropriate excavation, storage, transport and/or disposal of liquid or solid waste
- Risks to human health from the handling, storage, transport and/or disposal of contaminated waste
- Increased presence of pests due to incorrect storage, handling and transport of wastes.

As shown in **Table 6-81** all waste generated during construction will be appropriately managed. In order to avoid potential issues associated with odour generation, decreased visual amenity and creating environments that attract animals/pest species (e.g. rats and mice), waste removal will occur at regular intervals, or more frequently, if required.

With the implementation of the proposed waste management and mitigation measures provided in **Table 6-84**, there will be no material impact in relation to the management of construction waste.

Operation

Waste generated during operation will include:

- Domestic waste such as office and food waste
- Maintenance and operations waste consisting of replaced equipment, packaging materials, scrap and excess materials and liquids such as transformer oils
- Sewage from the toilets and the kitchen on-site.

These wastes will be generated at variable quantities over the full expected 35 year life of the Project depending on the stage.

The waste generated by the Project during this phase will be minimal and can be managed using conventional waste collection, handling and disposal procedures in compliance with regulatory requirements.

Waste generated from equipment replacement is likely to be low. The Project layout has been designed considering flood and bushfire risk, and the tracking system automatically stows the panels into a horizontal position during storm events, reducing the risk of damage to equipment.

Replacement of transformer oils will be carried out in accordance with the OEMP which will detail handling, collection, storage, transportation and disposal measures in compliance with regulatory requirements. Maintenance of site vehicles will be carried out at specialised facilities in nearby towns and not within the Project Area.

A summary of the anticipated operation waste types and quantities generated during operation is provided in **Table 6-81**, along with the likely waste classifications and the proposed handling, treatment and disposal methods.

Table 6-82 Potential operation waste types, classifications, approximate volumes and management methods

Waste type	NSW EPA Waste Classification	Approximate volume to be removed	Proposed handling, treatment and/or disposal method
Domestic waste	General waste (putrescible)	8 tonnes per annum	Recycled, if not possible dispose at suitable facility.
Maintenance waste consisting of replaced equipment, packaging materials, scrap and excess materials	General waste (non-putrescible)	10 m^3 per annum	Reuse and recycle where possible. Residual to landfill.
Transformer oils from operation and maintenance activities	Hazardous waste	1,500 L per annum	Offsite disposal at a licenced facility
Sewage from the toilets on-site.	Liquid waste	200 m^3 per annum	Septic system will be periodically emptied by a licensed contractor and disposed of at an appropriately licensed facility.

Decommissioning

Decommissioning waste will be largely associated with the removal of the primary Project infrastructure from the Project Area. Recycling and re-use options, particularly for PV modules and associated equipment, will be investigated approaching the end of life of the Project. This material will be reused or recycled as far as is practical at the time to avoid generating landfill waste.

A summary of the waste types and quantities anticipated to be generated during decommissioning is provided in **Table 6-81**, along with the likely waste classifications and the proposed handling, treatment and disposal methods.

Table 6-83 Potential decommissioning waste types, classifications, approximate volumes and management methods

Waste type	NSW EPA Waste Classification	Approximate volume to be removed	Proposed handling, treatment and/or disposal method
Green waste	Green waste	All material expected to be reused	On-site reuse.
Waste oils, lubricants and liquids	Hazardous waste	450 tonnes	Transport by a licensed contractor and disposed of at an appropriately licensed facility
Sewage from the toilets on-site	Liquid waste	200 m^3	Septic system will be periodically emptied by a licensed contractor and disposed of at an appropriately licensed facility.
Above ground infrastructure such as solar panels, steel posts, electrical cabling, lithium	General waste (non-putrescible)	About 1.3 million panels 50,000 tonnes of steel 20,000 tonnes of copper wiring	Reuse and recycled where possible. Residual to landfill.

Waste type	NSW EPA Waste Classification	Approximate volume to be removed	Proposed handling, treatment and/or disposal method
phosphate iron battery, inverters			
Site office and access roads	General waste (non-putrescible)	Negligible.	Remain in situ, reuse or recycled.
Security fencing	General waste (non-putrescible)	50 tonnes	Recycled, if not possible dispose at suitable facility.
Domestic waste	General waste (non-putrescible)	25 tonnes	Recycled, if not possible dispose at suitable facility.

Management and mitigation measures

Management and mitigation measures that will be implemented for the Project to address potential waste impacts are listed in **Table 6-84**.

Table 6-84 Management and mitigation measures – waste

ID	Management and mitigation measure	Timing
OW1	A Waste Management Plan (WMP) will be developed and implemented outlining the measures and strategies to be implemented on site to manage, reuse, recycle and safely dispose of waste.	Construction and Operation
OW2	All waste will be assessed, classified, managed and disposed of in accordance with the Waste Classification Guidelines (NSW EPA, 2014). Where appropriate, a waste classification letter will be prepared to allow for materials to be disposed off-site to a licensed landfill in accordance with NSW EPA guidelines.	Construction
OW3	On-site waste management will include the appropriate separation and storage of waste streams to enable recycling and reuse wherever possible to reduce associated environmental impacts and impact to the capacity of local waste management facilities.	Construction
OW4	Wood pallets will be reused if in good condition, returned to the supplier if practicable, or sold for wood chip if damaged or recycled.	Construction
OW5	Hazardous waste (e.g. waste oil, paint, septic wastewater, asbestos, etc) will be collected by a licenced waste contractor for disposal at a licenced facility.	Construction and Operation
OW6	Portable toilet facilities will be available for construction workers within the Development Footprint.	Construction
OW7	All generated and regulated waste records will be retained for waste tracking purposes.	Construction
OW8	Solar panels will be recycled at all stages of the project. If required, investigations into waste and recycling options in broader NSW will be undertaken to ensure there is capacity at facilities to support the Project.	Construction, Operation and Decommissioning
OW9	A Waste Management Plan will be prepared as part of the Decommissioning plan will have a WMP.	Decommissioning
OW10	The Proponent will engage with EnergyCo and other developers on a strategy to minimise impact to local waste facilities, where possible.	Construction, Operation and Decommissioning

6.14.2 Air quality

Secretary's Environmental Assessment Requirements

No specific SEAR requirements were provided for air quality, however an assessment for this environmental aspect has been provided below.

Methodology

A qualitative desktop assessment has been carried out to estimate the potential air quality impacts associated with the construction and operation of the Project. This involved:

- Reviewing legislation for air pollution and air quality in NSW
- Identifying potential air pollution generating activities during construction and operation
- Describing the proposed mitigation and management techniques for key air pollutants during construction and operation.

Existing environment

Air Quality Index

The background air pollution at the Project Area has been characterised through ambient monitoring undertaken by DPHI. The monitoring station closest and most representative of the Project Area is the Dubbo Bureau of Meteorology (BOM) monitoring site approximately 55 km west of the Project Area. The monitoring site is, despite the distance, an appropriate source of data as the landscape of Dubbo is similar to that of the Project Area's landscape, with the exception of the Project Area's landscape having less in the way of built infrastructure.

The following relevant pollutants are monitored by the Dubbo monitoring:

- Fine particles less than 2.5 micrometres in diameter ($PM_{2.5}$)
- Fine particles less than 10 micrometres in diameter (PM_{10}).

Data from the Dubbo monitoring station have been summarised in **Table 6-85**. The results of the fine particles from the monitoring site, are all of 'good' air quality.

Table 6-85 Dubbo monitoring station air quality data (NSW Government, 2025b)

Pollutant	Averaging period	Concentration (µg/m^3)			
		1 August 2024	1 September 2024	1 October 2024	1 November 2024
$PM_{2.5}$	1 hour average	2.5	2	2	1.5
PM_{10}	1 hour average	4	5	5	4.5

National Pollutant Inventory

The air quality within the CWO region is generally considered to be good (NSW Government, 2025a). This is due to the area being predominantly agricultural, having a dispersed population and the absence of major air polluting industries such as large mines. There are no facilities registered on the National Pollution Inventory within 5 km of the Project Area. Existing air pollution sources will be predominantly from agricultural activities and vehicle emissions along nearby roads.

Sensitive receptors

The Project is located in a rural agricultural setting. The nearest receptors are residential dwellings on agricultural properties. A total of 31 non-associated dwellings have been identified within a 4 km radius of the Project Area (refer to **Figure 2-2**). The nearest residential receptor is approximately 68 m from the Project Area.

Impact assessment

Construction

During the construction phase, dust will be generated by earthworks and vehicle movements on unsealed roads during dry weather.

The supporting framework for the solar panels will be attached onto posts that will be driven or screwed into the ground. Bulk earthworks will be restricted to levelling and grading for the construction of the solar trackers, trenching for cable installation, and levelling the ground for the PCUs, substations, control building and BESS. Due to the relatively flat terrain of the Project Area, there will be no major cut and fill works or significant stockpiling of earth.

Air emissions will be generated from vehicles transporting workers to and from the Project Area, trucks delivering construction materials and construction machinery such as piling rigs, excavators, graders and diesel generators. The emissions will be highest during peak construction but will be temporary in nature. These emissions will be expected to be dispersed by prevailing winds and are unlikely to significantly affect local air quality.

Based on this likely impact and the standard air quality mitigation measures proposed below, the air quality impacts during construction are not considered to be significant.

Operation

Localised dust will be generated from vehicles travelling on the internal roads during routine inspection works and maintenance activities. The air quality (dust) impact of these movements on local and regional air quality throughout the operational phase is expected to be negligible.

Emissions will be generated by workers vehicles when travelling to and from the Project Area each day, as well as during periodic maintenance activities and occasional unscheduled repair works. Emissions associated with grass cutting will be reduced through the application of sheep grazing throughout the Project Area. As such, air emissions throughout the operation phase are considered to be negligible.

A key environmental benefit of Project is the generation of electricity without the emissions of greenhouse gases that will otherwise be generated from non-renewable power generation options. The reduction in greenhouse gas emissions will have a positive impact on reducing the intensity of climate change.

Management and mitigation measures

Management and mitigation measures that will be implemented for the Project to address potential waste and air quality impacts are listed in **Table 6-86**.

Table 6-86 Management and mitigation measures – air quality

ID	Management and mitigation measure	Timing
OA1	Equipment engines will be properly maintained and switched off when not in use for prolonged periods, where practicable.	Construction
OA2	Working practices (location and scale of activities which generate dust emissions) will be modified during periods of adverse weather (hot, dry, and windy conditions)	Construction
OA3	Vehicle loads entering and leaving sites will be covered to prevent escape of materials during transport.	Construction

6.15 Cumulative impacts

6.15.1 Secretary's Environmental Assessment Requirements

Table 6-87 sets out the SEARs relevant to cumulative impacts and where the requirements have been addressed in this EIS.

Table 6-87 SEARs – Cumulative

Relevant SEARs	
Cumulative	**Where addressed**
In particular, the EIS must include: • an assessment of the likely impacts of all stages of the development (which is commensurate with the level of impact), including any cumulative impacts of the site and existing, approved or proposed developments in the region, and impacts on the site and any road upgrades, in accordance with the Cumulative Impact Assessment Guideline (DPIE, 2022a), including but not limited to Spicers Creek Wind Farm, Dunedoo Solar Farm, Tallawang Solar Farm, Birriwa Solar Farm and Barneys Reef Wind Farm, taking into consideration any relevant legislation, environmental planning instruments, guidelines, policies, plans and industry codes of practice	This section (**Section 6.15**)
Biodiversity	**Where addressed**
The EIS must address the following specific matters: • a cumulative impact assessment of biodiversity values in the region from nearby developments	**Section 6.15.3** and **Appendix G (Biodiversity Development Assessment Report)**
Transport	**Where addressed**
The EIS must address the following specific matters: • a cumulative impact assessment of traffic from nearby developments including but not limited to Spicers Creek Wind Farm, Dunedoo Solar Farm, Birriwa Solar Farm, Tallawang Solar Farm and Barneys Reef Wind Farm	**Section 6.15.3** and **Appendix H (Traffic and Transport Impact Assessment)**
Land	**Where addressed**
The EIS must address the following specific matters: • an assessment of the potential impacts of the development on existing land uses on the site and adjacent land, including: - a cumulative impact assessment of nearby developments	**Section 6.15.3** and **Appendix P (Soils, Land and Agriculture Impact Assessment)**
Noise	**Where addressed**
The EIS must address the following specific matters: • an assessment of the construction noise impacts of the development in accordance with the Interim Construction Noise Guideline (ICNG), operational noise impacts in accordance with the NSW Noise Policy for Industry (2017), cumulative noise impacts (considering other developments in the area)	**Section 6.15.3** and **Appendix I (Noise and Vibration Impact Assessment)**

6.15.2 Methodology

Cumulative impacts occur when the impacts from a project interact or overlap with impacts from other projects. This can result in a larger overall effect on environmental, social, economic values that people value or are important to sustaining environmental function. This may occur even when impacts of the contributing projects are not significant or substantial in their own right.

The Cumulative Impact Assessment Guideline (CIA Guidelines) (DPIE, 2022a) define two broad assessment approaches, incremental and cumulative. This assessment follows the latter approach, and

is an ‘issue-specific cumulative impact assessment’, where the cumulative impacts of the Project on key matters is assessed with other relevant future projects. The CIA Guidelines identifies this approach as effective where there is potential for material cumulative impacts with other relevant future projects.

This chapter has been prepared to assess potential cumulative impacts associated with the construction and operation of the Project when considered together with other developments and activities occurring in the nearby area.

The preparation of the cumulative impact assessment involved:

- Scoping the cumulative impact assessment, using the ‘Key questions to answer in scoping the cumulative impact assessment’, as outlined in the CIA Guidelines (DPIE, 2022a). This included screening relevant projects and assessment matters (residual impacts) to be assessed further in the CIA (**Table 6-89**)
- Assessing the extent and consequence of cumulative impacts on each environmental relevant aspect from the Project alongside multiple other projects
- Recommending additional measures to manage and mitigate potential cumulative impacts.

A search of publicly available information has been undertaken to identify current and future projects in the vicinity of the Project. These projects are shown on **Figure 6-29**. This included large scale projects identified on the Major Projects website as these are more likely to result in cumulative impacts. Very small scale projects that are typically subject to local development applications have not been considered. Projects that are operational have not been considered for cumulative impacts, as they form part of the existing environmental baseline for each environmental matter assessed in this EIS.

Identified projects were then screened for physical and temporal overlap and the availability of data (**Table 6-88**). The level of assessment was determined by the certainty of physical and temporal overlap between project impacts and data availability for each environmental aspect:

- Overlap is likely and there is potential for substantial cumulative impacts – quantitative assessment of cumulative impacts has been undertaken.
- Potential for overlap however unlikely to result in substantial cumulative impacts – qualitative assessment of cumulative impacts has been undertaken.
- Unlikely to overlap – project has been screened out.

The screening process is documented in **Table 6-89**.

Table 6-88 Screening criteria

	Criteria
Physical overlap	Physical overlap represents the spatial zone of influence of the Project where potential impacts may overlap with those of other developments. Given the nature of cumulative impact assessments, the physical overlap is not fixed and varies depending on the environmental aspect being assessed. Cumulative impact study areas include: • Visual: 5km • Traffic and transport: Projects proposing to use the Golden Highway and Spring Ridge Road • Noise and vibration: 5km • Biodiversity: 30km • Aboriginal heritage: 5km • Land use and agriculture: CWO REZ • Socio-economic: Mudgee Surrounds – West SA 2 and Dubbo Surrounds – SA2 (described in **Section 6.13.2**).
Temporal overlap	Only projects likely to be built concurrently or consecutively, or operate concurrently, with the Project have been screened in. The potential for cumulative impacts has been assessed for the following periods: • Construction (including commissioning): Approximately 47 months commencing late 2027

	Criteria
	• Operation: Approximately 35 years for the solar array infrastructure and 25 years for the BESS, reflecting the expected lifespan on this infrastructure. Although information on proposed project construction timeframes is publicly available for most projects, several of these timeframes had lapsed or were inconsistent with remaining approval process. Accordingly, a precautionary approach was taken and assumed to overlap temporally.
Data uncertainty	Projects at a conceptual or pre-approval stage have been considered; however, they are generally not assessed in detail due to an absence of project and/or environmental impact details or development timeframes.

EnergyCo in conjunction with Premier's Department, Department of Environment, Energy, Climate Change and Water, Regional NSW, Infrastructure NSW, DPHI, Office of Local Government, Transport, Education (Skills), Treasury, Aboriginal Affairs and Enterprise Investment & Trade is concurrently involved in preparing a study of cumulative impacts for the CWO REZ. While EnergyCo's study will have no material impact on the Project's assessment process, it will provide valuable insights for State and local governments. The outcomes of the study will allow State and local governments to make informed decisions on matters such as population growth and change, housing supply, infrastructure delivery, waste management, access to local water resources and other measures that might be needed to address cumulative impacts of development on communities within the CWO REZ.

Similarly, in January 2024, Mid-Western Regional Council prepared a study to assess the impacts of additional population on services, infrastructure and housing as a result of SSD projects. Given the proximity to the Mid-Western Region LGA, the Project was included in this study, which is available on Council's website.

The Proponent understands that there may be a cumulative impact on community services (e.g. health services, supermarkets) and that is an area of community concern (**Chapter 5.0 Stakeholder and community engagement**). By providing workforce accommodation, the Project seeks to be as self-sufficient as possible so as to not rely or place pressure on nearby community services. The provision of a first aid station with an onsite nurse has been included in the workers accommodation. Cumulative impacts on community services are therefore not directly assessed in the sections below, and are considered to form part of the broader CWO REZ cumulative impact studies identified above.

6.15.3 Cumulative impact assessment

Identified projects and overlaps

The screening of developments relevant to cumulative impacts and the potential physical and temporal overlap of impacts is documented in **Table 6-89**.

Likely overlaps between projects were identified for visual amenity, and this has been assessed quantitatively. Potential overlaps between projects were identified for biodiversity, traffic and transport, noise and vibration, Aboriginal heritage, waste and socio-economic. These have been assessed qualitatively.

Table 6-89 Identified projects

Project	Detail	Potential overlap of impacts
Approved projects		
Central-West Orana REZ Transmission (Elong Elong Energy Hub) New twin double circuit 500 kV transmission lines between Wollar and the proposed substations at Merotherie and Elong Elong, and connections from these lines to renewable energy generation and storage projects in the CWO REZ	• Adjacent to the south of the Project. • Construction is anticipated to commence late 2024, and will overlap with the Project. • Operations will overlap, and given the proximity of the projects, operational cumulative impacts are anticipated.	• Traffic and Transport - construction • Noise and vibration – construction and operation • Biodiversity – construction • Socio-economic – construction and operation
Spicers Creek Wind Farm 700 MW wind farm, 400 MW BESS and associated infrastructure	• Approximately 1 km from the Project. • Construction is anticipated to commence between 2025 and 2029, and may overlap with the Project. • Operations will overlap, and given the proximity of the projects, operational cumulative impacts are anticipated.	• Traffic and Transport - construction • Noise and Vibration – construction and operation • Biodiversity- construction • Socio-economic – construction and operation
Birriwa Solar Farm 600 MW solar farm, 600 MW BESS and associated infrastructure	• Approximately 25 km from the Project. • Construction is anticipated to commence late 2026, and may overlap with the Project. • Operations will overlap, however, given the distance between projects, operational cumulative impacts are not anticipated.	• Traffic and transport - construction • Socio-economic – construction and operation
Liverpool Range Wind Farm 1,320 MW wind farm and associated infrastructure	• Approximately 59 km from the Project. • Construction timings are unknown, and may overlap with the Project. • Operations will overlap, however, given the distance between projects, operational cumulative impacts are not anticipated.	• Traffic and transport- construction

Project	Detail	Potential overlap of impacts
Under assessment		
Sandy Creek Solar Farm 700 MW solar farm, 700 MW BESS and associated infrastructure	• Adjacent to the south-west of the Project. • Construction is anticipated to commence 2026, and may overlap with the Project. • Operations will overlap, and given the proximity of the projects, operational cumulative impacts are anticipated.	• Visual - operation • Traffic and Transport - construction • Noise and Vibration – construction and operation • Biodiversity- construction • Socio-economic – construction and operation
Tallawang Solar Farm 500 MW solar farm, 200 MW BESS and associated infrastructure	• Approximately 23 km from the Project. • Construction timings are unknown, and may overlap with the Project. • Operations will overlap, however, given the distance between projects, operational cumulative impacts are not anticipated.	• Traffic and Transport - construction • Biodiversity- construction • Socio-economic – construction and operation
Valley of the Winds Wind Farm 800 MW wind farm, 320 MW BESS and associated infrastructure	• Approximately 35 km from the Project. • Construction timings are unknown, and may overlap with the Project. • Operations will overlap, however, given the distance between projects, operational cumulative impacts are not anticipated.	• Traffic and Transport - construction
Response to submissions (RtS)		
Mayfair Solar Farm 60 MW solar farm, 500 MW BESS and associated infrastructure	• Approximately 25 km from the Project. • Construction timings are unknown, and may overlap with the Project. • Operations will overlap, however, given the distance between projects, operational cumulative impacts are not anticipated.	• Traffic and Transport - construction
Beryl BESS 100 MW BESS and associated infrastructure	• Approximately 26 km from the Project. • Construction timings are unknown, and may overlap with the Project. • Operations will overlap, however, given the distance between projects, operational cumulative impacts are not anticipated.	• Traffic and Transport - construction • Biodiversity - construction
Burrendong Wind Farm 400-500 MW wind farm and associated infrastructure	• Approximately 43 km from the Project. • Construction timings are unknown, and may overlap with the Project. • Operations will overlap, however, given the distance between projects, operational cumulative impacts are not anticipated.	• Traffic and Transport - construction

Project	Detail	Potential overlap of impacts
Currently preparing EIS		
Dapper Solar Farm 300 MW solar farm and associated infrastructure	• Approximately 2 km from the Project. • Construction timings are unknown, and may overlap with the Project. • Operations will overlap, and given the proximity of the projects, operational cumulative impacts are anticipated.	• Visual - operation • Traffic and Transport - construction • Noise and Vibration – construction and operation • Biodiversity - construction
Orana Wind Farm 524 MW wind farm, two 100 MW BESS and associated infrastructure	• Approximately 11 km to the east of the Project. • Construction timings are unknown, and may overlap with the Project. • Operations will overlap, and given the proximity of the projects, operational cumulative impacts are anticipated.	• Traffic and Transport - construction • Biodiversity - construction
Avonside Solar Farm 180 MW solar farm, 400 MW BESS, and associated infrastructure	• Approximately 13 km from the Project. • Construction timings are unknown, and may overlap with the Project. • Operations will overlap, however, given the distance between projects, operational cumulative impacts are not anticipated.	• Traffic and Transport - construction • Biodiversity - construction
Mavis Solar Farm 250 MW solar farm, 100 MW BESS and associated infrastructure	• Approximately 25 km from the Project. • Construction timings are unknown, and may overlap with the Project. • Operations will overlap, however, given the distance between projects, operational cumulative impacts are not anticipated.	• Traffic and Transport - construction
Piambong Wind Farm 551 MW wind farm, 100 MW BESS and associated infrastructure	• Approximately 29 km from the Project. • Construction timings are unknown, and may overlap with the Project. • Operations will overlap, however, given the distance between projects, operational cumulative impacts are not anticipated.	• Traffic and transport - construction
Narragamba Solar Farm 320 MW solar farm and associated infrastructure	• Approximately 37 km from the Project. • Construction timings are unknown, and may overlap with the Project. • Operations will overlap, however, given the distance between projects, operational cumulative impacts are not anticipated.	• Traffic and Transport - construction

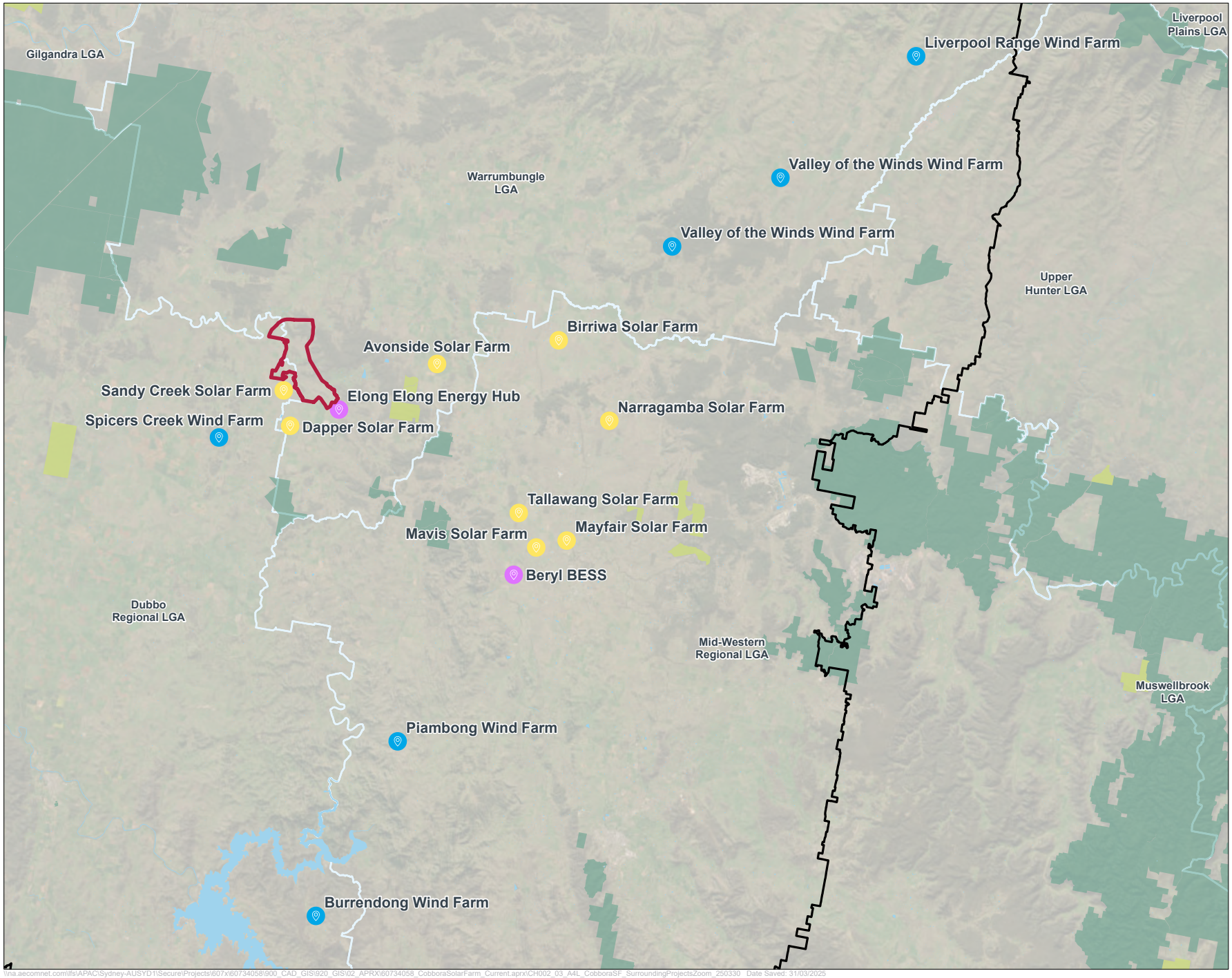

FIGURE 6-29: SURROUNDING RENEWABLE ENERGY PROJECTS NEAR THE PROJECT AREA

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Visual

Projects scoped in:

- Dapper Solar Farm
- Sandy Creek Solar Farm

The above projects were included on the basis of being located within a 5 km buffer of the Project, as 'proposed or approved solar energy projects' in accordance with the Technical Supplement - Landscape and Visual Impact Assessment (version 1.1) (DPHI, 2024e).

A quantitative viewshed analysis (based on topography alone) was run assuming a worst-case scenario where each project is developed to their site boundary (given lack of available public information), showing the areas where the Project may be viewed simultaneously alongside the two other projects. It was identified that both projects have the potential to be viewed consecutively and/or simultaneously with the Project, despite the low horizontal scale of the nearby solar projects and the surrounding landscape's undulating topography. A simple assessment was undertaken for each of the 11 non-associated dwellings where the viewshed identified a potential line of sight to multiple projects.

Cumulative visual impacts on public roads are anticipated to be limited and fleeting, given the presence of existing roadside vegetation which will screen views to the projects. The local rural fire station, located adjacent to the Project, may experience simultaneous westward views of Sandy Creek Solar Farm and the Project. However, given the low sensitivity of the fire station, cumulative visual impacts are considered low impact.

Cumulative visual impacts on private receptors are anticipated to be limited, as the majority of receptors that may experience simultaneous views of multiple projects are dwellings associated with the assessed projects. Simultaneous visibility from non-associated dwellings was found to be screened by existing vegetation, with assessments determining a low cumulative impact on private receivers from the projects. The Project was found to contribute to potential cumulative impacts at one private receptor (PR_15, this receiver is associated with Spicers Creek Wind Farm). A wireframe identified that the Project is likely to make a minor contribution to the total cumulative visual impact to PR_15. It is anticipated existing intervening vegetation will reduce potential views to the Project from this dwelling. A detailed assessment of PR_15 will be undertaken to further assess the potential cumulative visual impact associated with Dapper Solar Farm and Sandy Creek Solar Farm, and determine the additional screen planting to be implemented, in consultation with the landowner.

Traffic and transport

Projects scoped in:

- Sandy Creek Solar Farm
- Elong Elong Energy Hub

The above projects were included on the basis of potentially overlapping construction periods and both projects proposing to use the Golden Highway and Spring Ridge Road. Construction overlap between the Project, Sandy Creek Solar Farm and the Elong Elong Energy Hub is likely to occur at or near the end of the construction periods of the Sandy Creek Solar Farm and Elong Elong Energy Hub (based on indicative timelines outlined in the respective EISs). Typically, the end of a construction period is associated with low traffic movement. However, cumulative traffic impacts may arise during the peak construction period if the construction timelines of nearby projects align with the Project.

Cumulative traffic impacts may include localised increases in congestion, reduced intersection performance, and longer travel times due to the combined traffic generated by these projects. Transportation of materials for all overlapping projects is anticipated to originate from Newcastle, with routes overlapping the Project's haulage route, particularly between the Port of Newcastle and the Golden Highway/Castlereagh Highway intersection, east of Dunedoo.

TfNSW and EnergyCo are currently planning necessary upgrades to the OSOM haulage route from the Port of Newcastle to the CWO REZ, including the Golden Highway/Spring Ridge Road intersection. These upgrades are expected to reduce cumulative traffic impacts along the proposed OSOM haulage route.

Despite the cumulative increase in traffic associated with this and the identified cumulative projects, the Golden Highway is expected to have sufficient capacity to accommodate the increased traffic due to:

- Low existing traffic volumes
- Construction traffic mainly occurring outside network peak hours
- Upgrades as part of the Port to REZ project planned to be completed prior to the commencement of the construction periods for these projects.

Spring Ridge Road will be utilised by the Project as well as both identified cumulative projects and may require further upgrades to support the traffic generated and specific project access needs. Widening of Spring Ridge Road is recommended in accordance with Austroads standards; however, this is not due to any impact of the projects but rather an existing deviation from Austroads standards. Moderate cumulative impacts may be expected along Spring Ridge Road in the event that peak construction periods overlap.

Noise and vibration

Projects scoped in:

- Spicers Creek Wind Farm
- Sandy Creek Solar Farm
- Elong Elong Energy Hub

The above projects were included on the basis of likely overlapping construction and operation periods and being located within a 5 km buffer of the Project. Dapper Solar Farm has been screened out on the basis on data uncertainty, with no publicly available noise assessment due to the project phase.

A qualitative cumulative noise impact assessment has been undertaken for construction, which assumes that the noisiest construction stage for any other construction project coincides with the construction of the Project. It is noted that construction noise contours have not been provided for Sandy Creek Solar Farm or Spicers Creek Wind Farm, limiting opportunities to assess an overlap of impacts. Spicers Creek Wind Farm states that construction will achieve the general intent of the NSW policies and is not assessed further. Sandy Creek Solar Farm identified five locations where predicted levels exceed the ICNG noise affected noise management level, none of which appears to overlap the Project construction noise contours. However, in the event of an overlap, under the assumed scenario:

- Where the Project is the dominant source of construction noise, the greatest increase in noise levels from either project at any receiver will be a maximum of 3 dB(A) on the levels presented in **Section 6.7.4**.
- Where receivers are impacted to a greater extent by other construction projects, overall construction noise levels at any receiver could be increased by as much as 3 dB(A) from those projects' noise levels.

The Project-related construction noise levels at all receivers for all construction scenarios are predicted to be well below the 'highly noise affected' level of 75 dB(A). Any cumulative impacts experienced by surrounding receivers is likely to remain below this level. Nonetheless, the cumulative noise impacts of nearby major projects will be further considered by the construction contractor when a detailed construction schedule becomes available for the Project.

Operational noise emissions from the Project have been modelled using worst-case conditions (e.g. adverse meteorological conditions, inverters modelled at 100% load and fan speed). Based on this worst-case scenario, operational noise associated with the Project was found to only have the potential to result in exceedances of evening noise criteria for three nearby receptors (exceedances between 3 dB and 5 dB). Of these three receivers with potential exceedances, one is an associated landowner of the Sandy Creek Solar Farm (PR_06). There is no physical overlap between noise contours above 35 dBA (the Project specific noise criteria) for the Project and the Spicers Creek Wind Farm and Sandy Creek Solar Farm. Therefore, no cumulative operational noise impacts are anticipated.

When operational equipment has been detailed and confirmed, a further operational noise assessment, including that of tonality and low frequency noise, will be undertaken to confirm the likelihood and extent

of cumulative impacts. It is noted that several receptors that may experience cumulative noise are associated with various projects and may be demolished as part of these developments. This will be confirmed in the further operational noise assessment.

Biodiversity

Projects scoped in:

- Sandy Creek Solar Farm
- Dapper Solar Farm
- Spicers Creek Wind Farm
- Orana Wind Farm
- Avonside Solar Farm
- Tallawang Solar Farm
- Beryl BESS

The above projects were included on the basis of being located within a 5 km buffer of the Project. Dapper Solar Farm has been screened out on the basis on data uncertainty, with no publicly available noise assessment due to the project phase.

A cumulative impact assessment of proposed and current projects within similar PCTs and habitats within 30 kilometres of the Project was undertaken using publicly available information (e.g. published BDARs). This assessment is presented in **Appendix G (Biodiversity Development Assessment Report)**.

Table 6-90 presents a summary of PCTs that will be affected by multiple projects, including Cobbora Solar Farm. The combined effects of these direct impacts may lead to habitat loss and fragmentation, reduced species populations, and long-term ecological changes within the region.

Table 6-90 Potential direct biodiversity cumulative impacts

Project, description and location	Potential biodiversity impacts
Cobbora Solar Farm	As stated in **Section 6.2**: • Direct impact on Box-Gum Woodland 108.44 ha BC Act, 9.35 ha EPBC Act. • Direct Impacts on Fuzzy Box Woodland, 8.64 ha BC Act. • Direct Impacts on Grey Box Woodland, 31.44 ha BC Act, 6.55 ha EPBC Act. • Direct impacts to Pine Donkey Orchid – 4.5 ha.
Sandy Creek Solar Farm	• Direct impact on Box-Gum Woodland 1.17 ha BC Act, 0.97 ha EPBC Act. • Direct Impacts on Fuzzy Box Woodland, 0.64 ha BC Act. • Direct Impacts on Grey Box Woodland, 1.5 ha BC Act, 1.39 ha EPBC Act. • Spotted Harrier, Speckled Warbler, Pine Donkey Orchid species credits. • Direct impacts to PCT 81 1.5 ha, PCT 201 14.81, PCT 266 1.15 ha, PCT 281 0.00 ha, PCT 468 0.74, PCT 599 1.22 HA
Spicers Creek Wind Farm	• The Project proposes to remove 269.2 ha of native vegetation of which 269.2 ha meets the offsetting threshold under the Biodiversity Offset Scheme (BOS). Of this, 96.9 ha conforms to Threatened Ecological Communities (TECs) under the BC Act. • 2.7 ha PCT 81, 16.7 ha PCT 266, 48.2 ha PCT 267, 76.7 PCT 272, 27.6 PCT 281, 93.2 ha PCT 467, 4 ha PCT 468. • Superb Parrot, Glossy Black-cockatoo, Barking Owl breeding habitat species credit impacts.

Project, description and location	Potential biodiversity impacts
Orana Wind Farm	• 744 ha of vegetation mapped under SM across 21 Potential PCTS. • Potential Box-Gum Woodland, Grey Box Woodland and Fuzzy Box Woodland TEC. • Potential threatened species habitat.
Avonside Solar Farm	• Two PCTs identified on SVM mapping, PCT 468 and PCT 437. • Potential Box-Gum Woodland TEC.
Tallawang Solar Farm	• Direct impact to 58.4 ha PCT 81, 121.85 ha PCT 281, 0.92 ha PCT 318. • Southern Myotis, Bluegrass species credits.
Beryl BESS	• Direct impacts to 4.07 ha PCT 281.

The Project will add to a cumulative impact on Box Gum Woodland TEC and Grey Box Woodland TEC through adding to a net loss of these TECs, however this loss is small within the local landscape, and within NSW, with steps undertaken to avoid and minimise impacts with view to ensuring the long-term viability of this TEC within the subject land.

Aboriginal heritage

It is recognised that the increasing number of projects being planned and developed in the CWO REZ is leading to a rise in the disturbance of Aboriginal sites, contributing to cumulative impacts on the region's Aboriginal cultural heritage. For the purposes of this discussion, projects located with a 5 km buffer of the Project were screened in to demonstrate the extent of potential cumulative impacts.

Projects scoped in:

- Spicers Creek Wind Farm
- Sandy Creek Solar Farm
- Elong Elong Energy Hub

Dapper Solar Farm has been screened out on the basis on data uncertainty, with no publicly available noise assessment due to the project phase.

Twenty-two of the 137 Aboriginal sites within the Project Area have the potential to be harmed by the Project. Of the Aboriginal sites being impacted by the Project, 20 have been assessed as being of low scientific value, and one of moderate scientific value. The remaining site has been assessed as being of high scientific value, and will be subject to partial impact.

Approximately 96 Aboriginal sites will be impacted by the surrounding projects, including at Sandy Creek Solar Farm (30), Spicers Creek Wind Farm (57) and Elong Elong Energy Hub (9).

These cumulative impacts, when extrapolated to the broader region, have the potential to result in a significant loss of cultural material. However, it is also noted that multiple developments in the region have the potential to generate cumulative benefits for Aboriginal heritage, including:

- Enhanced archaeological and scientific understanding of previously under-researched landscapes
- Improved recognition and documentation of contemporary Aboriginal cultural values in the region
- Greater opportunities for Aboriginal communities to engage in heritage interpretation, develop narratives, and visually represent Aboriginal values, stories, and places – addressing a current gap in the region
- Increased awareness and appreciation of Aboriginal cultural heritage among the broader community.

Land use and agriculture

The Solar Guidelines note that, at the scale of NSW, the cumulative risk to agricultural land and productivity attributable to large-scale solar development is very low (DPHI, 2024d). The Australian Energy Market Operator estimates that NSW will need approximately 20,000 MW of large-scale solar generation by 2050. This will require approximately 40,000 ha of land or only 0.06% of rural land in NSW. Even in the highly unlikely scenario that all of NSW's solar generation were located on important agricultural land (this land covers around 13.8% of the state and is 6-7 times more agriculturally productive than the remaining 86.2% of the state) only 0.4% of this land will be required (DPHI, 2024d).

A potential cumulative impact of the Project is the availability of employees and contractors, which may be reduced due to the considerable workforce demands of multiple concurrent renewable energy projects in the CWO REZ. This increased competition for labour has the potential to drive higher demand for agricultural workers, contractors, and support services, potentially leading to increased costs for agricultural businesses. However, this cumulative impact is expected to be temporary as it will be limited to the overlapping construction phases of renewable energy developments in the CWO REZ.

The integration of renewable energy projects with ongoing agricultural activities (such as livestock grazing) supports dual land use opportunities. This approach allows for the colocation of solar and wind developments while maintaining some established agricultural industries, such as grazing, and infrastructure. Changes to agricultural land use and productivity are anticipated to be minor for each individual wind and solar project, and the continuation of agricultural activities alongside these developments is expected to minimise broader regional impacts. The overall cumulative impact on agriculture is expected to be low.

Socio-economic

Potential cumulative social impacts during construction could include:

- Safety risks arising from increased traffic – cumulative traffic impacts on Spring Ridge Road during construction may cause delays or changes in access arrangements, potentially leading to community anxiety and concern.
- Health and wellbeing impacts from construction fatigue – several of the projects noted in **Table 6-89** will be under construction at the same time as the Project. This could induce construction fatigue in people living and working in the social locality. This can arise from the combined impacts of different projects (e.g. traffic impacts from one project and noise impacts from another), or simply from the concurrent or consecutive nature of disruptions in the area. Noting the proposed construction periods for each, as well as their proximity, this impact is likely to be most felt by residents and businesses in the proximity of the township of Cobbora.
- Potential increased pressure on local health services in Dunedoo and Dubbo by medical needs from the construction workforce and potential increased demand for access to basic supplies at the supermarket - accessibility for residents to local health services and basic supplies at supermarkets is not anticipated to be affected as the Project aims to be self-sufficient. There will be on-site accommodation, and catering will be provided for construction workers. The provision of a first aid station with an onsite nurse has been included in the workers accommodation to reduce pressure on local health service providers.

In terms of benefits, nearby projects will provide employment opportunities to the local community through labour for trades people, and business opportunities from supplying materials or renting construction equipment. The Proponent is committed to a benefit sharing agreement paid over the operating life of the development, to be developed and implemented in accordance with the Benefit-Sharing Guideline (DPHI, 2024a) (**Section 6.13.5**).

The severity of the cumulative social impacts has the potential to be significant, particularly if multiple projects in the region lead to community anxiety, concern, and fatigue.

Other potential cumulative impacts

Environmental aspect	Assessment
Waste management	Waste management cumulative impacts has been considered as a broad CWO REZ issue (i.e. all projects), and have not been assessed for specific projects. Cumulative impacts associated with strain placed on waste management facilities in the region could occur if the construction or decommissioning phases of several nearby projects overlap. Limited cumulative impacts on waste management are anticipated from operation. EnergyCo has been engaging with local councils within the CWO REZ to discuss the capacity of waste infrastructure to accept the anticipated waste volumes of the CWO REZ projects. EnergyCo has undertaken a series of studies to guide how cumulative impacts in the CWO REZ will be managed, including a dedicated study on waste management. EnergyCo will continue to engage with local councils about the management of potential cumulative waste management impacts.
Flooding	Project-related changes in flooding conditions are considered minor relative to existing conditions. Given the minor nature of these impacts, cumulative impacts are unlikely.
Surface water, groundwater and water use	Project-related changes to water quality, riparian land and water supply are considered negligible to minor relative to existing conditions for the Project. Given the minor nature of these impacts, cumulative impacts are unlikely.
Non-Aboriginal heritage	No items of local or state heritage significance will be affected by the Project. Therefore, there will be no cumulative impacts on non-Aboriginal heritage from the Project in combination with other nearby developments.
Hazard and risk	Overall, the risk of identified hazardous materials and hazardous events propagating off-site is considered rare. Given the rare nature of a Project-related impact, cumulative impacts are unlikely. Additionally, given the nominated separation distances between all projects electric and magnetic field producing equipment from sensitive receivers, and the low levels of EMFs expected to be produced by the Project, cumulative risks to human health from EMFs are considered unlikely.
Bushfire	The Bushfire Threat Assessment identified that there is no cumulative impact on bushfire risk if other solar farms implement the requirements of the RFS Planning for Bushfire Protection, and associated APZ.
Air quality	The EIS has considered the impact of construction, operation and decommissioning of the Project upon air quality. During the construction and decommissioning phases, dust will be generated by earthworks and vehicle movements on unsealed roads during dry weather. Cumulative impacts could occur if the construction or decommissioning phases of several nearby projects overlap. Project-related air quality impacts during construction are not considered to be significant and cumulative impacts are not anticipated. Air emissions throughout the operation phase are considered to be negligible, and cumulative impacts are not anticipated.

7.0 Justification of the Project

7.1 Justification

7.1.1 Recognised need

Reducing carbon emissions is a critical component of the global effort to combat the catastrophic effects of climate change. This is the focus of numerous international and national commitments, supported by specific government plans and policies. Most notably, Australia has enacted legislation to achieve net-zero emissions by 2050, in line with the country's commitments to the Paris Agreement (AOFM, 2024). The transition to an electricity system that is based primarily on renewable energy is essential for reducing Australia's overall carbon emissions.

Electricity generation and storage presents an opportunity to provide a secure, affordable and modern energy system for NSW, thereby placing a downward pressure on energy prices. Furthermore, battery storage technologies are anticipated to be key to the development of renewable energy zones under the NSW Government's *Transmission Infrastructure Strategy 2018*.

The Project would help support the transition to renewable energy and provide infrastructure required to facilitate a growth in renewable energy infrastructure and development. The Project would align with key strategic energy policy for NSW, including the NSW Government's *Central West and Orana Regional Plan 2041* and *Transmission Infrastructure Strategy 2018*. Delivery of the Project would provide greater network stability in the Central West Orana region, and more broadly across the NSW electricity grid.

In recognition of the need for renewable energy projects, the Commonwealth DCCEEW has established the National Renewable Energy List (Priority List). Cobbora Solar Farm has been identified as a priority renewable energy project on the Priority List.

7.1.2 Suitability of the Project site

The Project Area has been selected within the CWO REZ, which was designated by the NSW Government based on a thorough statewide geospatial mapping exercise conducted in 2018 (EnergyCo, 2021). This analysis identified optimal locations for renewable energy generation, focusing on areas with strong resource potential, proximity to existing electrical infrastructure, and careful consideration of land use interactions, including agriculture and biodiversity conservation (EnergyCo, 2021).

The Project Area is deemed highly suitable for a large-scale solar farm due to:

- Favourable topography for solar farm construction
- No biophysical strategic agricultural land mapped on the Project Area
- Limited views of the Project Area from neighbouring properties
- Good access to the Project Area from a suitable road network capable of sustaining the volume and types of vehicles proposed for construction
- Favourable solar resource for generation
- Permissibility (with consent) of the Project under existing land zoning.

However, the Development Footprint has undergone refinements to avoid and minimise impacts (**Section 7.1.3**).

7.1.3 Actions to avoid or minimise the impacts of the project

The Project has been developed with the objective of minimising potential impacts on the local and regional environment and community. The Project has undergone refinements to enhance its suitability to the site. This includes adjustment of the solar array area to avoid or minimise impacts to:

- Large contiguous vegetated areas
- Aboriginal heritage sites and PADs

- Areas subject to flooding.

Other important landscape features taken into consideration when developing the general arrangement included:

- Waterways (notably, Laheys Creek, which runs through the middle of the Project Area) – these have been avoided, with the exception of three proposed waterway crossings
- Local roads that traverse the Project Area – consideration of access points to minimise impacts on local roads
- Nearby residential houses and associated buildings or infrastructure – assessment of potential impacts for avoidance or for proposed mitigation
- Existing utilities (including the high-pressure gas pipeline) – avoided through Project design.

The remaining land was identified as the indicative 'Developable Area' for the Project. This developable area was then used to design the layout of the solar farm infrastructure.

The design and construction methodology would continue to be developed with the above objectives in mind, including the consideration and integration of input from stakeholders and the local community.

7.1.4 Consideration of community views

An overview of community and stakeholder consultation undertaken, any concerns raised and where they have been addressed in this EIS is provided in **Chapter 5.0 Stakeholder and community engagement**. Key concerns raised included hazards and risk, impacts on agricultural land and biodiversity, visual impacts, and accommodation for construction workers. These concerns have been assessed within this EIS and, as necessary, addressed through the Project's committed mitigation and management measures.

During community engagement activities in late 2024 and early 2025, some community members also made a request to rename the Project. Alternative project names are being considered through engagement with the local community and stakeholders. This process will continue, with a final project name to be determined at a future time.

Stakeholder and community engagement will continue during the EIS exhibition stage, as outlined in the CSEP. The results of both the formal EIS exhibition and the ongoing community consultation activities will be summarised in the submissions report for the Project, which will be submitted prior to DPHI's assessment of the development.

7.1.5 Consistency of the Project with relevant statutory requirements and government policies

The development of the Project is supported by Commonwealth, State, regional and local plans and policies (as described in **Chapter 2.0 Strategic context** and **Chapter 4.0 Statutory context**) and would support the government aspirations with respect to greenhouse gas (GHG) emission reduction targets.

7.1.6 Future monitoring and communication

Specific future monitoring and communication protocols will be developed as part of the Project's management plans (**Appendix E**), and in accordance with conditions of consent. These plans will incorporate specific measures to monitor performance of the Project.

The Project's environmental performance during construction will be monitored through the specific actions outlined in the Construction Environmental Management Plan (CEMP), and its associated sub-plans. The Project would also implement a range of other plans to govern environmental and social performance during construction. These plans would be designed to comply with relevant legislation and conditions of consent and would include a range of mitigation measures developed during and following the environmental assessment documented in this EIS.

The operation performance of the Project would be governed by an Operational Environmental Management Plan (OEMP), and associated sub-plans.

A Decommissioning Plan will be prepared and implemented for the Project, in line with the applicable legislative requirements and best practice guidelines existing at that time. A Traffic Management Plan specific to the decommissioning phase will be prepared prior to decommissioning.

7.1.7 Key uncertainties

Key uncertainties are outlined in each chapter and technical report of this EIS. Technical studies have considered uncertainties and documented assumptions, and mitigation measures have been proposed to address potential impacts.

7.2 Objects of the EP&A Act

Consideration has been given to the consistency of the Project with the objects of the EP&A Act as outlined in **Table 7-1**.

Table 7-1 Consistency with the objectives of the EP&A Act

Object	Response
a. to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources	The Project provides electricity generation, storage and firming capacity to the NEM as well as additional services to assist grid stability, including frequency control services. During construction, economic benefits are anticipated for local businesses due to increased demand for goods and services. Benefits would also be associated with direct and indirect employment opportunities. During operation, the Project would benefit communities, businesses, and industry by increasing the reliability in the NEM. The Project may provide an overall downward pressure on energy prices by shifting use of lower cost renewable generation from times of peak generation to times of peak demand. This in turn may support reduced electricity costs for households, businesses and industry over the medium to long term while supporting the transition to a low carbon energy future. The Proponent is committed to a Community Shared Benefit Strategy (CSBS), to be developed and implemented in accordance with the Benefit-Sharing Guideline. This will be developed in collaboration with the local community, Warrumbungle Shire Council and Dubbo Regional Council. These discussions are ongoing at the time of EIS lodgement. In total, funding for benefit-sharing will be $850 per megawatt per annum based on installed capacity and paid over the operating life of the development and indexed to the Consumer Price Index. An Agrisolar Strategy has been prepared for the Project to facilitate the continuation of agricultural activities, such as sheep grazing across the Project Area where possible. Technical specialists have been engaged to assess and report on the potential for the Project to impact upon the natural and other resources of the State and local areas. Impacts have been assessed and discussed in **Chapter 6.0 Assessment of impacts**.

Object	Response
b. to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment	This EIS describes the potential environmental, economic and social impacts of the Project and has used these results to inform the preparation of the development application, specifically the Projects' design and the proposed mitigation measures. The Project would contribute to the continued growth of sustainable renewable energy generation and storage capacity, as well as providing a secure, affordable and modern energy system for NSW, thereby assisting to place a downward pressure on energy prices. The design, assessment, mitigation, management and monitoring decision made on behalf of the Project during its development and in response to this EIS, have incorporated the principles of ecologically sustainable development. The Project's consistency with the principles of Ecologically Sustainable Development (ESD) is further outlined in **Section 7.4**.
c. to promote the orderly and economic use and development of land	The Project comprises a permissible development, which is consistent with the statutory context and planning controls at the subject site. The Project represents a suitable, economic and orderly use of the subject land. The Project is located within close proximity to key power utility infrastructure, namely the proposed Elong Elong Energy Hub, thereby not requiring additional land use to connect to transmission infrastructure. As detailed in this EIS, the Project would result in positive economic impacts, with appropriate mitigation measures and management strategies being proposed to reduce adverse environmental and social impacts.
d. to promote the delivery and maintenance of affordable housing	This object is not applicable to the Project.
e. to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats	A comprehensive BDAR was undertaken to assess any the Project's potential impacts on biodiversity within the site or in the vicinity of the site. The BDAR considered the potential biodiversity impacts of the Project in accordance with the BAM, including the degree to which biodiversity impacts have been avoided in the first instance, and then mitigated. Most impacts on biodiversity will occur during construction from the clearing of native vegetation and removal of habitat for a range of flora and fauna. Identified direct and indirect impacts, and relevant management and mitigation measures are described in **Section 6.2**. Where residual impacts remained, the BDAR prescribes the number of biodiversity offset credits that must be obtained on behalf of the Project. These credits will be obtained and retired prior to the commencement of construction. The mitigation measures would allow for the protection of the environment, including the protection and conservation of native animals and plants, threatened species, populations and ecological communities, and their habitats.

Object	Response
f. to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage)	An ACHAR has been undertaken by qualified specialists to assess the Aboriginal values within the Site and surrounds. The Project would result in 22 of the 137 AHIMS registered sites being impacted. Additionally, three PAD sites would be partially impacted by electrical infrastructure installation, though the detailed design would aim to avoid harm to these where possible. Overall, the ACHAR concluded that there would be a moderate impact to Aboriginal cultural heritage values within the Project Area. Management and mitigation measures would be implemented for the Project to address potential impacts to Aboriginal heritage (described in **Section 6.3**). A HHAR has been undertaken by qualified specialists to assess potential impacts of the Project on non-Aboriginal heritage. Two historic heritage items are located within the Project Area (one within the Development Footprint and one outside the Development Footprint). Both items were assessed as being of no heritage significance and are not protected under the NSW *Heritage Act 1977*. Accordingly, there are no impacts proposed to historic heritage (described in **Section 6.4**).
g. to promote good design and amenity of the built environment	Land surrounding the Project is characterised by undulating cleared land used primarily for sheep and cattle grazing or dry land cropping. The design of the Project has been developed in direct response to this landscape context. Potential visual, noise, air quality and cumulative impacts on sensitive receivers and the broader community have been assessed and described in **Sections 6.6**, **6.7**, **6.14** and **6.15**, respectively. With the implementation of proposed management and mitigation measures, the Project will not adversely affect the amenity of the surrounding environment.
h. to promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants	The Project would be constructed and maintained in accordance with the Building Code of Australia and other relevant statutory requirements. All components of the Project have been designed to incorporate and comply with relevant electrical and building safety standards. Over the life of the Project, infrastructure would be maintained, or upgraded, to ensure it operates in a safe and efficient manner.
i. to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State	The Project is being assessed as SSD under Part 4 of the EP&A Act. The Project would comply with all relevant local, state and federal environmental planning requirements. As summarised in **Chapter 5.0 Stakeholder and community engagement**, a wide range of government agencies have been consulted regarding the Project, including relevant State government departments and local councils. Ongoing consultation would occur with these agencies regarding the Project, and would continue through its implementation and operation, as required.

Object	Response
j. to provide increased opportunity for community participation in environmental planning and assessment.	As described in **Chapter 5.0 Stakeholder and community engagement**, there have been a range of engagement activities to inform the community about the Project and seek community (and other stakeholder) feedback. The community and other stakeholders will continue to be engaged throughout the EIS process. This EIS will be placed on public exhibition in accordance with the requirements of the EP&A Act. During the exhibition period community members and stakeholders have the opportunity to submit feedback to DPHI. Community engagement will also be maintained throughout the construction of the Project.

7.3 Summary of project impacts

This EIS has considered all relevant potential environmental, social and economic impacts associated with the Project, as well as the need for the Project and alternative development options. This section summarises these factors.

Despite the Project's design seeking to avoid adverse environmental and social impacts, some impacts associated with construction and operation are inevitable. These impacts will, however, be subject to mitigation and management measures outlined throughout the EIS such that any residual impacts are not expected to be significant.

7.3.1 Environmental impacts

This EIS has assessed potential impacts to the biophysical environment which are summarised in **Table 7-2**.

Table 7-2 Summary of environmental impacts

Matter	Summary
Biodiversity	The primary direct impact of the Project to biodiversity would be the clearing of native vegetation within the Development Footprint. This would affect approximately 250 ha of native vegetation and 1,349 ha of Category 1 – Exempt land, including up to 166 scattered trees, 75 of which include hollows. A range of indirect and prescribed impacts were also assessed as part of the BDAR including edge effects, reduction in habitat and connectivity, introduction of weeds and pathogens and impacts on water bodies. Overall, potential indirect impacts during the construction of the Project have been assessed as low to moderate. The offset requirement for the Project was calculated using the BAM Calculator. The Project requires a total of 3,918 ecosystem credits to compensate for impacts on native PCTs, scattered trees and ecosystem credit species. In order to secure the required biodiversity offsets, the Proponent has commenced investigations into the establishment of local Biodiversity Stewardship Sites.
Aboriginal heritage	Impacts on heritage items have been either avoided or mitigated by altering the Development Footprint to conserve identified Aboriginal sites or the proposed implementation of an Aboriginal Cultural Heritage Management Plan. However, 22 of the 137 AHIMS registered sites would still be impacted. This includes nine isolated finds and 13 artefact scatters, with 18 sites entirely within the Development Footprint, resulting in a total loss of value, and four sites partially within the Development Footprint, resulting in a partial

Matter	Summary
	loss of value. Additionally, three PAD sites would be partially impacted by electrical infrastructure installation, though detailed design would aim to avoid harm to these where possible. If avoidance is not possible, test excavation of the discreet areas would likely be required. The ACHAR concluded that there will be a moderate impact to Aboriginal cultural heritage values within the Project Area.
Historic heritage	Two historic heritage items (Mechanical seeder (HS01) and a House and outbuildings (HS04)) were identified within the Project Area. HS01 is located outside of the Development Footprint and would not be impacted and HS04 is located partially within the Development Footprint and will be demolished as part of the Project. Using the *Guidelines for assessing places and objects against the Heritage Council of NSW criteria* (DPE 2023), both items were assessed as being of no heritage significance and are not protected under the NSW *Heritage Act 1977*. Accordingly, there are no impacts proposed to historic heritage.
Geology, soil and land use	The land and soil capability (LSC) assessment classified the Development Footprint as: • LSC class 3: high capability land (873 ha) • LSC class 4: moderate capability land (437 ha) • LSC class 5: moderate low capability land (298 ha). It is anticipated there would be no permanent impacts on LSC classes within the Development Footprint as a result of the Project, providing the recommended soil management and mitigation measures are implemented. Agricultural land use in the Dubbo Regional LGA and Warrumbungle LGA would be reduced by the Project temporarily during construction by 0.3% and 0.1% respectively, once operational. There would be no permanent decrease in land available for agriculture use. The impacts on LSC 3, agricultural land use and primary productivity are considered a minor impact in the context of existing presence within the Dubbo and Warrumbungle LGAs.
Visual	Two LCZs were identified within and surrounding the Project Area. The operational impacts on the two LCZs was assessed as being low. A total of 31 non-associated private (dwelling) viewpoints with a line of sight of the Project were identified within 4 km. Thirteen representative viewpoints with a line of sight to the Project from public locations such as roads were identified within 2.5 km. One public viewpoint will be subject to a moderate impact, with all other viewpoints assessed as having a low to very low visual impact. Glint and glare impacts were also considered for the Project. No impact was identified for residential viewpoints and low impacts which do not require mitigation were identified for Spring Ridge Road, Sweeneys Lane and Tallawonga Road. Overall, the existing landscape has the ability to absorb the Project with a low degree of visual impact.
Noise and vibration	Noise from construction activities is predicted to comply with the recommended NMLs at all but three receivers. No receivers would be subject to noise levels exceeding the ‘highly noise affected’ level of 75 dB(A).

Matter	Summary
	Noise levels are predicted to comply with the most stringent (evening time) operational noise criteria at all locations. However, with the application of a conservative assumption of equipment tonality (applied through a 5dB correction factor), noise levels may exceed the Project-specific noise limits at three receivers (exceedances between 3 dB and 5 dB), in a rare worst-case scenario. In the event that noise modelling at detailed design indicates that exceedances persist, the Project has identified an alternative layout option with four solar farm inverters relocated away from receivers. Modelling indicates that this alternative layout option would reduce noise levels to within Project-specific noise limits, except for negligible (1 dB) exceedances predicted at two receivers. Noise generated by the BESS during the evening and night-time periods is predicted to be compliant for all receivers. Compliance with safe working distances for vibration-intensive equipment would ensure that no vibration impacts occur. Mitigation measures are proposed to address residual noise impacts. Overall, noise impacts on surrounding receivers are considered to be minor.
Traffic and transport	During the peak construction period, it is expected that up to 14 light vehicle movements (two-way) and 88 heavy vehicle movements (two-way) per day, and 34 shuttle bus movements (two-way) per fortnight would be undertaken. Up to two OSOM vehicle movements (two-way) per day may also be undertaken, as required. The Golden Highway and Spring Ridge Road were found to have sufficient capacity to accommodate the expected increased traffic volumes. As such, overall, traffic impacts as a result of the Project are considered minor. To monitor and manage the impact of Project construction traffic pre-construction pavement condition assessments are proposed along Spring Ridge Road. Consultation with nearby projects, including Sandy Creek Solar Farm and Elong Elong Energy Hub, and Dubbo Regional and Warrumbungle Shire councils will be undertaken to coordinate any other potential upgrades.
Flooding	The operational phase of the Project may result in changes to surface conditions due to the installation of impervious solar panels. The panels could also reduce hydraulic roughness by reducing vegetation growth underneath. Other infrastructure, such as the BESS and substations, may cause minor rerouting and disruption of shallow flows. The overall impact on flooding is expected to be minor. Three bridge crossings are proposed to support the Project: two along Sandy Creek and one along Laheys Creek. It was identified that the proposed creek crossings may be overtopped during all modelled Annual Exceedance Probability events (i.e. 20%, 1%). In the floodplain and surrounding areas, the model shows that flood depths slightly decrease in the locations planned for solar panel arrays and internal roads. These areas also experience little to no change in water velocity.
Surface water, groundwater and water use	Most of the Project has been designed to maintain a separation of at least 50 m from Sandy and Laheys Creeks, reducing the potential for construction activities to affect these waterways. To manage direct impacts to riparian land when constructing the new creek crossings, crane platforms would be constructed at least 20 m from riparian land, where possible, with pre-cast bridges being lifted into place. No removal of riparian vegetation would be required for the construction of these crossing, with sites selected to avoid disturbance.

Matter	Summary
	Water demand for construction of the Project is estimated to be approximately 410 megalitres (ML) over the 36-month construction period (excluding commissioning works). It is anticipated that non-potable water (e.g. for construction and toilets) would be trucked to site or sourced from onsite licenced groundwater bores. Potable water would also be trucked to site by a commercial water tanker from a licensed source and stored in tanks on site until needed. Water use during operation is minimal, primarily for module cleaning. This water would be sourced from licensed groundwater bores or trucked to site under commercial arrangement and stored in tanks until needed. Overall, the impact on surface water quality and groundwater resources is considered to be effectively mitigated using standard management measures.
Hazard and risk	The Project involves the storage and transport of hazardous materials such as lithium-ion batteries, coolant mixtures, petroleum products, and compressed refrigerant gases. The Project is not considered potentially hazardous based on the storage and transport of these materials as they are not expected to exceed relevant risk screening thresholds. Potential hazards from the Project are associated with 'other types of hazards', with five hazardous incident scenarios being identified. It was found that the Project can be managed in accordance with the established risk criteria and in accordance with "as low as reasonably practicable" (ALARP) principles. Provided the recommendations in the PHA are adhered to, the risk profile for the Project was assessed as follows: • Off-site risk: Acceptable. • On-site risk: ALARP, except for exposure to electromagnetic field (EMF) which is Acceptable.
Bushfire	The Project Area and surrounds are mapped as Category 1 and Category 2 Bushfire Prone Land. The Project meets and exceeds the NSW APZ requirements under PBP. These measures mitigate against a fire occurring onsite spreading to surrounding areas. A comprehensive Bushfire Emergency Management and Operations Plan (BEMOP) will be developed of the Project's operation, in consultation with local emergency services. It was concluded that the Project Area is suitable for the development and operation of a solar farm and BESS.
Social and economic	Potential social impacts resulting from amenity changes (such as noise and vibration, air quality, visual impacts, and traffic) during construction will be largely managed through mitigation and management specified for those topics. On this basis, the SIA concluded that the adverse impacts of the Project would be addressed appropriately.
Other issues: waste management	Typical waste types generated during construction include general construction waste (approximately 5,000 tonnes), fuels, lubricants and chemicals (approximately 14,000 litres) and sewage (approximately 95,000 m^3). The waste generated during operation will be minimal and can be managed using conventional waste collection, handling and disposal procedures in compliance with regulatory requirements.

Matter	Summary
	A Waste Management Plan (WMP) will be developed to address waste during construction, operation and decommissioning. The WMP would prioritise minimising construction waste, recycling solar panels and monitoring technological advancements for efficient recycling methods.
Other issues: air quality	The Project is located in a predominantly agricultural area, with dispersed populations and no major air-polluting industries. During construction, dust emissions from earthworks and vehicle movements, and emissions from machinery and transport vehicles are anticipated. These impacts would be temporary and are not considered likely to be significant. During operation, localised dust emissions from internal road traffic and emissions from maintenance activities are anticipated but considered negligible. A key environmental benefit of the Project is the generation of electricity without significant greenhouse gas emissions, contributing positively to climate change mitigation.

7.3.2 Economic impacts

The Project would result in the following economic benefits for the State and the local community:

- Improved security of energy supply within NSW
- Increased electricity affordability
- Support for regional development and industry
- Creation of up to approximately 734 jobs during the Project's construction phase, and up to approximately 20 full-time equivalent positions during operation
- Increased expenditure at local and regional businesses through purchases by construction workers
- Direct expenditure associated with onsite construction activities
- Indirect employment and expenditure through the provision of goods and services required for construction.

7.3.3 Social impacts

The social impacts of the Project have been comprehensively assessed in **Appendix J (Social Impact Assessment)** and summarised in **Section 6.13**.

Potential social outcomes of the Project during construction include:

- Potential minor changes on the makeup of the local community in the region
- Minor adverse impacts to local amenity, particularly through noise and visual amenity
- Economic benefits during construction arising from increased expenditure at local businesses.

Potential social impacts resulting from amenity changes (such as noise and vibration, air quality, visual impacts, and traffic) during construction will be largely managed through mitigation and management specified for those topics. On this basis, the SIA concluded that the adverse impacts of the Project will be addressed appropriately.

Mitigation and management strategies have been proposed for each of the identified potential social impacts to minimise negative consequences and to maximise social benefits for the local community (refer to **Section 6.13.6**).

7.3.4 Cumulative impacts

The environmental, social and economic impacts associated with a development may be assessed as minor when considered in isolation, but may be more substantial when considered cumulatively alongside other nearby projects.

Several other renewable energy projects are proposed nearby, including Sandy Creek Solar Farm, Elong Elong Energy Hub, Spicers Creek Wind Farm and Dapper Solar Farm. No other large developments are proposed.

There is potential for cumulative impacts associated with: loss of sensitive or threatened biodiversity values; increased traffic volumes on the surrounding road network; noise impacts from simultaneous construction activities and operations; changes to the surrounding landscape and visual impacts; and impacts to registered heritage items. Additionally, an influx of out of area workers across several projects can have a cumulative impact on the social environment of nearby towns and the use of social infrastructure.

Overall, it is considered that the Project's design, committed mitigation measures and careful planning of Project construction would address these challenges effectively. Additionally, EnergyCo, in conjunction with a range of NSW Government Agencies, is currently preparing a study of cumulative impacts for the CWO REZ. The outcomes of the study will allow State and local governments to make better informed decisions on matters such as population growth and change, housing supply, infrastructure delivery, waste management and access to local water resources. Improved management of these issues at a strategic level will help to address cumulative impacts on communities within and around the CWO REZ.

7.4 Ecologically sustainable development

7.4.1 The principles

This section provides a review of the Project, its impacts, and associated safeguards with respect to the principles of ESD. These are provided in accordance with the requirements of the EP&A Regulation and the *Protection of the Environmental Administration Act 1991* (NSW). The principles, as listed in part 8, division 5 section 193 of the EP&A Regulation, are as follows:

1. *The principles of ecologically sustainable development are the following—*
    a. ***the precautionary principle**,*
    b. ***inter-generational equity**,*
    c. ***conservation of biological diversity and ecological integrity**,*
    d. ***improved valuation, pricing and incentive mechanisms**.*
2. *The precautionary principle is that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.*
3. *In applying the precautionary principle, public and private decisions should be guided by—*
    a. *careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and*
    b. *an assessment of the risk-weighted consequences of various options.*
4. *The principle of inter-generational equity is that the present generation should ensure the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.*
5. *The principle of the conservation of biological diversity and ecological integrity is that the conservation of biological diversity and ecological integrity should be a fundamental consideration.*
6. *The principle of improved valuation, pricing and incentive mechanisms is that environmental factors should be included in the valuation of assets and services, such as—*

a. *polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement, and*

b. *the users of goods and services should pay prices based on the full life cycle of the costs of providing the goods and services, including the use of natural resources and assets and the ultimate disposal of waste, and*

c. *established environmental goals should be pursued in the most cost effective way by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.*

The following sections provide an overview of the principles and how they have been applied to the Project.

7.4.2 Precautionary principle

The precautionary principle deals with certainty in environmental and technical decision-making. It provides that where there is a threat of serious or irreversible environmental damage, the absence of full scientific certainty should not be used as a reason to postpone measures to prevent environmental degradation.

An EIS is a public process which examines the potential effects of the Project. Therefore, the EIS process is considered precautionary in nature. The requirement to assess the impacts of the Project is a form of regulation designed to identify and address uncertainty about the effects of these activities.

This EIS has been prepared by suitably experienced and qualified professionals in their respective fields and has identified and assessed the potential environmental impacts of the Project. The assessment of the potential impacts of the Project is considered to be consistent with the precautionary principle. The assessments undertaken in the EIS are consistent with accepted scientific and assessment methodologies and have considered relevant statutory and agency requirements. Where there has been uncertainty in the prediction of impacts through the EIS process, a conservative approach was adopted to ensure the worst-case scenario was predicted in the assessment of impacts. For example, for all construction scenarios assessed in the noise and vibration assessment, all equipment was modelled as operating at the same time, which is unlikely, and a conservative assumption. Similarly, a conservative estimate of equipment type, quantities, and noise levels were considered for operational noise sources and it is likely that the Project will comprise less equipment.

The Project has evolved to avoid impacts where possible, and to reflect the findings of the assessments undertaken (refer to **Section 1.4.3**). Appropriate management and mitigation measures have been developed to minimise potential environmental impact. Taking these measures into account, it is considered that there would be no threat of serious or irreversible damage to the environment as a result of the Project.

7.4.3 Inter-generational equity

Inter-generational equity requires that the present generation pass onto the next generation an environment that does not limit the ability of those future generations to attain a quality of life at least equal to that of the current generation.

Renewable energy generation and storage has emerged as a key enabler for the decarbonisation of the Australian electrical system. The Project would contribute directly to the share of renewable energy generation on the NEM, with its associated BESS providing for greater penetration of intermittent renewable energy sources while maintaining network stability and security. By providing these grid services, the Project would help support greater renewable investment, delivery, and integration, and help reduce the economy's reliance on conventional fossil fuel sources. These benefits would contribute to reducing GHG for the benefit of current and future generations.

This EIS has assessed the type and extent of relevant potential impacts that may be caused by the Project. The Project incorporates a range of management and mitigation measures that aim to maintain the environmental conditions within and surrounding the Project such that detrimental impacts do not affect the future health, diversity and productivity of the environment.

7.4.4 Conservation of biological diversity and ecological integrity

Biological diversity relates to the breadth and variety of life. Ecological integrity refers to maintenance of the relationships, dependencies and services supplied by all lifeforms and the physiochemical environment to each other. The conservation of these elements is critical to the proper functioning of natural environments and the biosphere in general. This principle asks that conservation of biological diversity and ecological integrity should be a fundamental consideration for a project.

During the development of the Project measures were taken to avoid potential impacts on biodiversity which would help maintain biological diversity and ecological integrity. These included adjusting the Development Footprint to avoid large contiguous vegetated areas and areas identified as highly sensitive from initial surveys undertaken as part of the BDAR.

The BDAR has been undertaken by qualified specialists to assess the ecological values within the Site and surrounds, to determine whether the Project is likely to have an impact on threatened biodiversity (refer to **Appendix G (Biodiversity Development Assessment Report)** and **Chapter 6.2**). There are direct impacts to approximately 250 ha of native vegetation and 1,349 ha of Category 1 – Exempt land due to the Project. These impacts will be compensated through the implementation of biodiversity offsets.

Management and mitigation measures have been prescribed to minimise, manage and offset residual biodiversity impacts (**Section 6.2.5**). Avoidance of clearing impacts would continue to be a key focus during the detailed design process.

7.4.5 Improved valuation and pricing of environmental resources

This principle is premised on an assumption that all resources should be appropriately valued and that the value of environmental resources should be considered alongside any economic or cost benefit analysis for the life of the Project.

Project benefits are considered to outweigh the costs. The Project would generate up to 734 jobs during construction and would continue to provide economic benefits to the local community through potentially assisting the smoothing of energy spot prices. The Project would also improve the penetration of renewable energy in the grid, supporting transition away from fossil fuel (coal and gas) generation, thereby contributing to a net reduction in GHG emissions.

The Project incorporates a range of management and mitigation measures to minimise potential impacts on the environment. The costs associated with these measures have been incorporated into the capital investment and operating costs of the Project.

7.4.6 Compatibility with the Principles of ESD

In preparing the Project, emphasis has been placed on the avoidance of impacts through careful design as well as management and mitigation measures to minimise potential adverse environmental, social and economic impacts. As such, the Project is considered to be compatible with the principles of ESD.

The design and construction methodology would continue to be developed with these principles in mind and would continue to consider the input of stakeholders and the local community.

7.5 Conclusion

The Project involves the development on a large-scale solar PV generation facility with the capacity to generate up to 700 MW (AC) of electricity and would also include a 400 MW / 1,600 MWh BESS. The Project would connect to the CWO REZ grid infrastructure via up to four onsite substations, connecting to the Elong Elong Energy Hub.

The development of the Project is consistent with Commonwealth, State, regional and local plans and policies and would support the government aspirations with respect to achieving long term GHG emission reduction targets.

Despite the Project's design seeking to avoid adverse environmental and social impacts, some impacts associated with construction and operation are inevitable. These impacts will however be subject to mitigation and management measures outlined throughout the EIS such that any residual impacts are not expected to be significant.

Overall, this EIS concludes that the Project should proceed as:

- it aligns with Australia's commitments under the Paris Agreement and the Net Zero Plan, aiming to achieve net-zero emissions by 2050;
- the Project Area was strategically chosen within the CWO REZ due to several favourable site characteristics, including suitable topography, the lack of biophysical strategic agricultural land, limited flooding potential, limited potential views from neighbouring properties, proximity to a robust road network and favourable solar resource;
- it will provide for the advantageous, orderly and economic use of land;
- It will deliver economic benefits to the local region, including the provision of social and economic benefits to both the local community and surrounding region throughout the Project's construction and ongoing operation; and
- it satisfies the principles of ESD as described in the EP&A Regulation.

Considering the ability of the identified adverse impacts to be suitably mitigated or managed, the Project's benefits are deemed to outweigh the potential impacts, and the Project is considered to be in the public interest. Based on the findings detailed within this EIS, the Project is considered justified and recommended for development consent.

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Appendix A

SEARs Table

Appendix A SEARs Table

Secretary's Environmental Assessment Requirements	Where addressed
General Requirements	
The Environmental Impact Statement (EIS) must be prepared in accordance with, and meet the minimum form and content requirements as prescribed by Part 8 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation) and must have regard to the State Significant Development Guidelines and Large-scale Solar Energy Guideline (2022) (Solar Guideline) and any relevant planning circulars.	This EIS has been prepared in accordance with the requirements of the EP&A act, State Significant Development Guidelines and the Solar Guideline.
In particular, the EIS must include: • a stand-alone executive summary; • a full description of the development, including: - details of construction, operation and decommissioning; - a high quality site plan at an adequate scale showing all infrastructure and facilities (including any infrastructure that would be required for the development, but the subject of a separate approvals process); - the Project Area (as per Table 1 of the SSD guidelines - preparing an environmental impact statement) and Development Footprint (disturbance area including but not limited to areas for infrastructure, road works, access tracks, defendable space, fencing and temporary laydown); - a high quality detailed constraints map identifying the key environmental and other land use constraints that have informed the final design of the development; - confirmation if the project is designated development in accordance with the *Environmental Planning and Assessment Act 1979* (EP&A Act) and the Regulation; • consistency in information presented in the EIS and all technical reports, including distances, development footprint, project design and infrastructure proposed, construction time frames and receiver numbers; • a strategic justification of the development focusing on site selection and the suitability of the proposed site with respect to potential land use conflicts with existing and future surrounding land uses (including existing land use, other proposed or approved solar and major projects, rural/residential development, Crown lands within and adjacent to the project site and subdivision potential) having regard to the Solar Guideline; a risk assessment of the potential impacts of the development, identifying the key issues for further assessment;	• An executive summary is provided at the start of this EIS. • A full description of the Project is provided in **Chapter 3.0** and includes: - details of construction (**Section 3.3**), operation (**Sections 3.2** and **3.4**) and decommissioning (**Section 3.5**) - a high quality site plan showing all infrastructure required for the development in **Appendix B** - a map showing key environmental and other land use constraints that have informed the latest design in **Appendix B**. Spatial data has been provided as part of the SSD application. - The Project is State Significant Development, and is not designated development. • A strategic justification of the Project, including site suitability, is provided in **Chapter 2.**0 and **Chapter 7.0** • A risk assessment of the potential impacts that identifies key issues for further assessment is provided in **Section 6.1.**
• an assessment of the likely impacts of the development on the environment, and any other significant issues identified in the above risk assessment focusing on the specific issues identified below, including:	• An assessment of the likely impacts of the Project on the environment is provided in **Chapter 6.0** and includes:

Secretary's Environmental Assessment Requirements	Where addressed
- a description of the existing environment likely to be affected by the development using sufficient baseline data; - an assessment of the likely impacts of all stages of the development (which is commensurate with the level of impact), including any cumulative impacts of the site and existing, approved or proposed developments in the region, and impacts on the site and any road upgrades, in accordance with the Cumulative Impact Assessment Guideline (DPIE, October 2022), including but not limited to Spicers Creek Wind Farm, Dunedoo Solar Farm, Tallawang Solar Farm, Birriwa Solar Farm and Barneys Reef Wind Farm, taking into consideration any relevant legislation, environmental planning instruments, guidelines, policies, plans and industry codes of practice; - a description and assessment if staging of the project is proposed including any site mobilisation or pre-construction works; - a description of the measures that would be implemented to avoid, mitigate and/or offset the impacts of the development (including draft management plans for specific issues as identified below); and - a description of the measures that would be implemented to monitor and report on the environmental performance of the development;	- a description of the existing environment - assessment of the likely impacts of all stages of the Project - a list of measures proposed to mitigate, manage, and/or offset these likely impacts • a list of measures to monitor and report on the environmental performance of the Project would be prepared as part of detailed design and construction and operation environmental management plans.
• a consolidated summary of all the proposed environmental management and monitoring measures, including a table identifying all commitments made to mitigation measures within the EIS;	A consolidated summary of proposed management and mitigation measures is provided in **Appendix E**.
• a detailed evaluation of the merits of project as a whole having regard to: - the requirements in Section 4.15 of the *Environmental Planning and Assessment Act 1979*, including the objects of the Act and how the principles of ecologically sustainable development have been incorporated in the design, construction and ongoing operations of the development; - the suitability of the site with respect to potential land use conflicts with existing and future surrounding land uses; and - feasible alternatives to the development and its key components, including siting and project design alternatives to avoid areas of biodiversity value, opportunities for shared infrastructure with proposed developments in the region, and the consequences of not carrying out the development;	A detailed evaluation of the merits of the Project as a whole is provided in **Chapter 7.0**
a detailed consideration of the capability of the project to contribute to the security and reliability of the electricity system in the National Electricity Market, having regard to local system conditions and the Department's guidance on the matter.	A detailed consideration of the capability of the project to contribute to the security and reliability of the electricity system in the National Electricity Market is provided in **Chapter 2.**0 and **Chapter 7.0**

Secretary's Environmental Assessment Requirements	Where addressed
Estimated Development Cost and Employment • Provide the estimated development cost (EDC) of the development prepared in accordance with the relevant planning circular using the Standard Form of EDC Report; and • Provide an estimate of the retained and new jobs that will be created during the construction and operational phases of the proposed development including details of the methodology to determine the figures provided.	• An EDC has been provided in the standard form as part of the SSD Application. It has not been made publicly available as it contains confidential Project information. • An estimate of the retained and new jobs is provided in **Section 3.3.5** (construction), **Section 3.4.1** (operation), and **Section 6.13.5** (economic assessment).
The development application must be accompanied by • a declaration from a Registered Environmental Assessment Practitioner that the EIS includes the information specified in the Department's Registered Environmental Assessment Practitioner Guidelines. The development application must be accompanied by the consent of the owner/s of the land (as required in clause 23(1) of the EP&A Regulation)	A REAP declaration has been provided for this EIS.
Biodiversity	
The EIS must address the following specific matters: • an assessment of the biodiversity values and the likely biodiversity impacts of the project in accordance with Section 7.9 of the *Biodiversity Conservation Act 2016* (NSW), in accordance the Biodiversity Assessment Method (BAM) 2020 and documented in a Biodiversity Development Assessment Report (BDAR). The BDAR must; - be prepared using the approved BDAR template; - document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the BAM; - assess the impacts associated with all ancillary infrastructure, including the transport route road upgrades; - include an assessment for serious and irreversible impacts (SAII) in accordance with Section 9.1 of the BAM; - include a strategy to offset any residual impacts of the development in accordance with the BC Act; and - be finalised by an accredited assessor as BAM-compliant within 14 days of submission.	A BDAR has been prepared and is attached as Appendix G (Biodiversity Development Assessment Report)
• unless BCS and DPHI determine the proposed development is not likely to have any significant impacts on biodiversity values.	Not applicable
• an assessment of the likely impacts on listed aquatic threatened species, populations or ecological communities, scheduled under the *Fisheries Management Act 1994*, and a description of the measures to minimise and rehabilitate impacts, including potential impacts on Sandy Creek and Laheys Creek.	Potential impacts to listed aquatic threatened species is discussed in **Section 6.2.4** and **Appendix G (Biodiversity Development Assessment Report)**

Secretary's Environmental Assessment Requirements	Where addressed
• a cumulative impact assessment of biodiversity values in the region from nearby developments.	Cumulative impacts are discussed in **Section 6.15**
• if an offset is required, details of the measures proposed to address the offset obligations.	Biodiversity offsets are discussed in **Section 6.2.4** and **Appendix G (Biodiversity Development Assessment Report)**
Heritage	
The EIS must address the following specific matters: • an Aboriginal Cultural Heritage Assessment Report (ACHAR) prepared in accordance with the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011) and the Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW (DCCEEW, 2010), identifying, describing, and assessing any impacts to any Aboriginal cultural heritage sites or values associated with the site and adjoining haulage routes (including impacts from any proposed earthworks, construction works, and road works), and including results of archaeological test excavations (where required), undertaken in accordance with the relevant standards and requirements;	An ACHAR has been prepared and is attached as **Appendix K (Aboriginal Cultural Heritage Assessment Report)**
• evidence of consultation with Aboriginal communities in determining and assessing impacts, identifying and selecting options for avoidance of Aboriginal cultural heritage and identifying appropriate mitigation measures (including the final proposed measures), having regard to the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DCCEEW, 2010b) including the consultation process outlined within.	Consultation with Aboriginal communities is discussed in the ACHAR and in **Section 6.3.2**
• assess the impact to historic heritage having regard to the Guidelines for Preparing a Statement of Heritage Impact.	An assessment of potential impacts to historic heritage is detailed in **Section 6.4.4** and **Appendix L – Historic Heritage Assessment Report.**
Land	
The EIS must address the following specific matters: • a detailed justification of the suitability of the site and that the site can accommodate the proposed development having regard to its potential environmental impacts, permissibility, strategic context and existing site constraints	Site suitability is discussed in **Section 2.2.2** and **Section 7.1**.
• an assessment of the potential impacts of the development on existing land uses on the site and adjacent land, including: - consideration of agricultural land, flood prone land, Crown lands, mining, quarries, mineral or petroleum rights (if relevant); - a soil survey to determine the soil characteristics and consider the potential for erosion to occur; and - a cumulative impact assessment of nearby developments	• Potential impacts on existing land uses and agriculture are discussed in **Section 6.5.4** and **Appendix P (Soils, Land and Agriculture Impact Assessment)**. • Flood prone land and other potential flood impacts are discussed in **Section 6.9** • Soil characteristics, including soil survey results, are

Secretary's Environmental Assessment Requirements	Where addressed
	discussed in **Section 6.5.3** and potential impacts to soil are discussed in **Section 6.5.4**. This is also documented in **Appendix P (Soils, Land and Agriculture Impact Assessment)**. • Potential cumulative impacts are discussed in **Section 16.15**.
• an assessment of the compatibility of the development with existing land uses, during construction, operation and after decommissioning, including: - consideration of the zoning provisions applying to the land, including subdivision (if required); - completion of a Land Use Conflict Risk Assessment (LUCRA) in accordance with the Department of Industry's Land Use Conflict Risk Assessment Guide; - assessment of the impact on agricultural resources and agricultural production on the Project Area and region in accordance with the Solar Guideline; and - details of how the proposed development would implement and achieve agrisolar activities on the Project Area.	• Zoning provisions are discussed in **Section 6.5.3** • A LUCRA has been prepared for the Project and is attached in **Appendix P (Soils, Land and Agriculture Impact Assessment)**. The results are discussed in **Section 6.5.4** • The assessment has been conducted in accordance with the Solar Guidelines, as discussed in **Section 6.5.2** • Agrisolar activities are discussed in **Section 3.4.4** and an Agrisolar Strategy is provided in **Appendix P (Soils, Land and Agriculture Impact Assessment)..**
Landscape and visual	
The EIS must address the following specific matters: • a landscape and visual impact assessment (LVIA), prepared in accordance with the Solar Guideline and the Technical Supplement – Landscape and Visual Impact Assessment;	A LVIA has been prepared and is attached as **Appendix F (Landscape and Visual Impact Assessment)**
• a detailed assessment of the likely visual impacts (including night lighting) of all components of the project (including transmission lines, substations and any other ancillary infrastructure) on surrounding residences (including approved developments, lodged development applications and dwelling entitlements), and key locations, scenic or significant vistas and road corridors in the public domain and on the Siding Spring Observatory in accordance with the Dark Sky Planning Guideline (2023); and	Potential visual impacts are discussed in **Section 6.6.4**
• details of measures to mitigate and/or manage potential impacts (including a draft landscaping plan for on-site perimeter planting, with evidence it has been developed in consultation with affected landowners);	Appropriate management and mitigation measures are discussed in **Section 6.6.5**
Glint and Glare	
provide a glint and glare assessment prepared in accordance with the Solar Guideline.	A glint and glare assessment is provided as part of **Appendix F (Landscape and Visual Impact Assessment)**.

Secretary's Environmental Assessment Requirements	Where addressed
Noise	
The EIS must address the following specific matters: • an assessment of the construction noise impacts of the development in accordance with the Interim Construction Noise Guideline (ICNG), operational noise impacts in accordance with the NSW Noise Policy for Industry (2017), cumulative noise impacts (considering other developments in the area), including (where appropriate):	The NVIA has been prepared in accordance with the relevant guidelines as detailed in Section 1.6 of **Appendix I (Noise and Vibration Impact Assessment)**.
- identification of impacts associated with construction, site emission and traffic generation at noise affected sensitive receivers, including the provision of operational noise contours;	• An assessment of construction and operational noise, and construction vibration impacts is provided in **Section 6.7.4**. • Noise contours are provided in **Appendix I (Noise and Vibration Impact Assessment)**.
- details of noise monitoring survey, background noise levels and amenity noise levels at the most-affected residential receivers;	Details of the existing noise environment and amenity noise levels are presented in **Section 6.7.2** and **Section 6.7.3**. Survey details are presented in **Appendix I (Noise and Vibration Impact Assessment)**.
- details of manufacturer specifications for plant and equipment and noise source inventory (demonstrating worst-case modelling of plant and equipment);	Details of manufacturer specifications for plant and equipment utilised in the assessment are presented in **Appendix I (Noise and Vibration Impact Assessment)**.
- an assessment of 'worst case' noise emission scenarios; - consideration of annoying characteristics of noise and prevailing meteorological conditions in the study area; and	An assessment of 'worst case' construction and operational noise and construction vibration impacts is provided in **Section 6.7.4**, including consideration of the site's prevailing meteorological conditions.
- details and analysis of the effectiveness of proposed management and mitigation measures to adequately manage identified impacts, including a clear identification of residual noise and vibration impacts following application of these mitigation measures and details of any proposed compliance monitoring programs.	Analysis of the effectiveness of measures, identification of residual impacts and details of proposed compliance monitoring programs are addressed within the mitigation measures presented in **Section 6.7.5**
Transport	
The EIS must address the following specific matters: • an assessment of the peak and average traffic generation, including light vehicles, shuttle buses, heavy vehicles and heavy vehicles requiring escort, construction worker transportation and transport of materials by rail	• A Traffic and Transport Impact Assessment **(Appendix H)** has been prepared for the Project. • Peak and average traffic generation is discussed in **Section 6.8.4**.
• an assessment of the likely transport impacts to the site access route (including, but not limited to, Golden Highway, Spring Ridge Road, Danabar Road, Sandy	Transport impacts on the site access route is discussed in **Section 6.8.4** and **Appendix H – Traffic and**

Secretary's Environmental Assessment Requirements	Where addressed
Creek Road, Sweeneys Lane and Tallawonga Road), site access points, particularly in relation to the capacity and condition of the roads	**Transport Impact Assessment**. Noting that under the revised project description Sandy Creek Road, Sweeneys Lane and Tallawonga Road are no longer being utilised as part of the project.
• an assessment of whether there will be any likely transport impacts to local heritage items which adjoin any proposed haulage routes	Impacts to Aboriginal cultural heritage are discussed in **Section 6.3** and non-Aboriginal heritage in **Section 6.4**.
• a cumulative impact assessment of traffic from nearby developments including but not limited to Spicers Creek Wind Farm, Dunedoo Solar Farm, Birriwa Solar Farm, Tallawang Solar Farm and Barneys Reef Wind Farm	Cumulative impacts from construction and operation are discussed in **Section 6.15** and **Appendix H – Traffic and Transport Impact Assessment**.
• provide details of measures to mitigate and / or manage potential impacts (developed in consultation with the relevant road authorities) including: - a schedule of all required road upgrades (including resulting from heavy vehicle and over mass / over dimensional traffic haulage routes), - clear figures of proposed road upgrades (including the site access point), and - road maintenance contributions, and any other traffic control measures.	• Mitigation and measurement measures are discussed in **Section 6.8.5**. • A schedule of required road upgrades and maintenance is provided in **Section 6.8.4** and **6.8.5**. • Details of consultation undertaken with relevant road authorities is provided in **Chapter 5.0 Stakeholder and community engagement**. • Refer to **Appendix H – Traffic and Transport Impact Assessment.**
Water	
The EIS must address the following specific matters: • an assessment of the likely impacts of the development (including flooding and flood modelling, if required) on surface water and groundwater resources (including Sandy Creek and Laheys Creek traversing the site and surrounding watercourses, drainage channels, wetlands, riparian land, farm dams, groundwater dependent ecosystems and acid sulfate soils), related infrastructure, adjacent licensed water users and basic landholder rights, and measures proposed to monitor, reduce and mitigate these impacts having regard to the Solar Guideline	• Potential impacts associated with flooding are discussed in **Section 6.9.4** including impacts to watercourses, drainage channels and farm dams. • Potential impacts to surface water and groundwater are assessed in **Section 6.10.4** • Appropriate management and mitigation measures are provided in **Section 6.9.5**
• a site water balance for the development	• An initial estimate of water demands and current availability for the Project is provided in **Section 6.10.4** • A site water balance would be undertaken for the Project during detailed design
• details of water requirements and supply arrangements for construction, operation and decommissioning, including licensing requirements and consultation with suppliers;	Water requirements and supply arrangements are discussed in **Section 6.10.4**

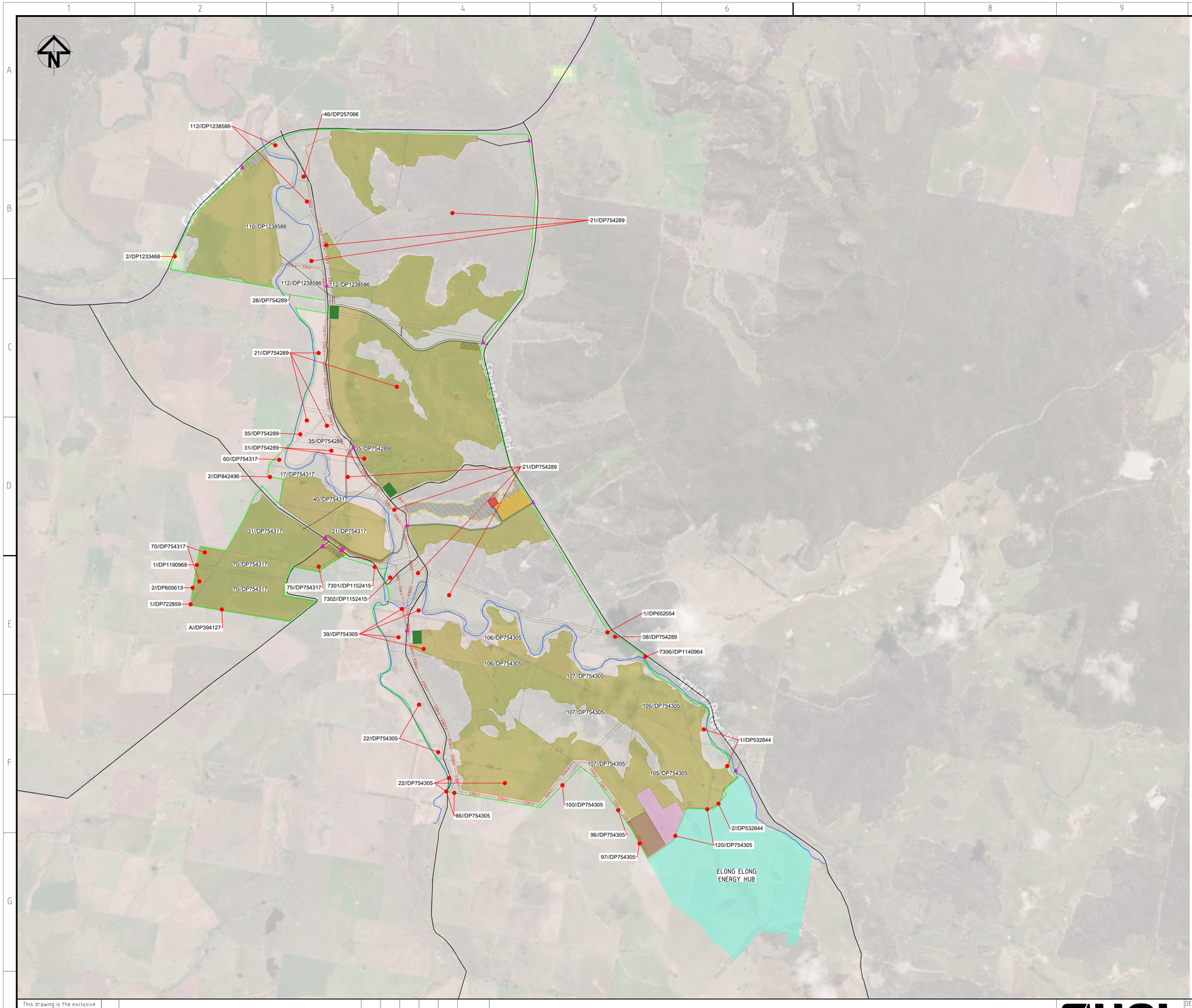
Secretary's Environmental Assessment Requirements	Where addressed
• assessing the impacts of the development, including any changes to flood risk and overland flows on-site or off-site, and detail design solutions and operational procedures to mitigate flood risk where required	• Potential impacts are discussed in **Section 6.9.4** and **Appendix O – Flood Impact Assessment.** • This includes a discussion of preliminary design solutions to mitigate flood risk. Mitigation and management measures are provided in **Section 6.9.5**
• where the project involves works within 40 metres of any river, lake or wetland (collectively waterfront land), identify likely impacts to the waterfront land, and how the activities are to be designed and implemented in accordance with the DPI *Guidelines for Controlled Activities on Waterfront Land* (2018) and (if necessary) *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings* (DPI 2003); and *Policy & Guidelines for Fish Habitat Conservation & Management* (DPI, 2013); and	Potential impacts to waterfront land are assessed in **Section 6.10.4** and relevant management measures are provided in **Section 6.10.5**
• a description of the erosion and sediment control measures that would be implemented to mitigate any impacts in accordance with *Managing Urban Stormwater: Soils & Construction* (Landcom 2004) and *Managing Urban Stormwater: Soils and construction – Volume 2A manual* (Landcom 2008);	A preliminary Erosion and Sediment Control Plan is provided in **Appendix O – Flood Impact Assessment** and summarised in **Section 6.10.5**
• Flood Risk: identification of any flood risk on site having regard to adopted flood studies, the potential effects of climate change and any relevant provisions of the NSW Flood Risk Management Manual; - where the development could alter flood behaviour, affect flood risk to the existing community or expose its users to flood risk, provide a flood impact and risk assessment (FIRA) prepared in accordance with the Flood Impact and Risk Assessment – Flood Risk Management Guide LU01; - detailed design solutions and operational procedures to mitigate flood risk where required.	• The Flood Impact Assessment was undertaken in accordance with the Flood Impact and Risk Assessment – Flood Risk Management Guide LU01. This is provided in **Appendix O – Flood Impact Assessment**. • **Section 6.9** includes a discussion of preliminary design solutions to mitigate flood risk. Detailed solutions would be developed during detailed design. • Mitigation and management measures are provided in **Section 6.9.5**
Hazards	
The EIS must address the following specific matters: • Dangerous Goods – a preliminary risk screening completed in accordance with *State Environmental Planning Policy (Resilience and Hazards) 2021*;	A Preliminary Hazard Analysis, including preliminary risk screening, is available in **Appendix M (Preliminary Hazard Analysis).** The preliminary risk screening is summarised in **Section 6.11.4**
• Battery Energy Storage System – a Preliminary Hazard Analysis (PHA) must be prepared in accordance with the *Hazardous Industry Planning Advisory Paper No. 6, 'Hazard Analysis' and Multi-Level Risk Assessment* (DoP, 2011). The PHA must consider all recent standards and codes and verify separation distances to	The Preliminary Hazard Analysis is available in **Appendix M (Preliminary Hazard Analysis)** and summarised in **Section 6.11.**

Secretary's Environmental Assessment Requirements	Where addressed
on-site and off-site receptors to prevent fire propagation and compliance with *Hazardous Industry Advisory Paper No. 4, 'Risk Criteria for Land Use Safety Planning* (DoP, 2011); and	
• Health – an assessment of potential hazards and risks including but not limited to bushfires, spontaneous ignition, electromagnetic fields or the proposed grid connection infrastructure against the International Commission on Non-Ionizing Radiation Protection (ICNIRP) *Guidelines for Limiting Exposure to Time-varying Electric, Magnetic and Electromagnetic Fields*;	• Potential hazards and risks (including health risks) are assessed in **Section 6.11.4**. • A bushfire threat assessment is detailed in **Section 6.12**
• Bushfire – a bushfire hazard assessment completed by a suitably qualified consultant and identifies potential hazards and risks associated with bushfires including the risks that a solar farm would cause bush fire and demonstrate compliance with Planning for Bush Fire Protection 2019;	A bushfire threat assessment is detailed in **Section 6.12** and **Appendix N (Bushfire Threat Assessment).**
• an assessment of the likely impacts associated with the high-pressure pipeline traversing the site in consultation with APA Group.	Impacts associated with the high-pressure pipeline are detailed in **Section 6.11.4.**
Social impact	
The EIS must address the following specific matters: • including an assessment of the social impacts or benefits of the project for the region and the State as a whole in accordance with Social Impact Assessment Guideline (DPE, 2023) including consideration of any increase in demand for community infrastructure services, consideration of construction workforce accommodation and consideration of potential opportunities for nearby settlements.	Social impacts and benefits are addressed in **Section 6.13.4,** and **Appendix J (Social Impact Assessment)**.
Economic	
• including an assessment of the economic impacts or benefits of the project for the region and the State as a whole and provide details of any proposed voluntary benefit sharing programs in accordance with the Solar Guideline.	Economic impacts and benefits are addressed in **Section 6.13.5**. The Project's benefit sharing framework is also addressed in this section.
Waste	
The EIS must address the following specific matters: • identify, quantify and classify the likely waste streams to be generated throughout all stages of the project, and describe the measures to be implemented to reduce waste generation, manage, reuse, recycle and safely dispose of this waste (in consultation with waste facilities, including Council); and • provide a waste management plan prepared in accordance with the Solar Guideline.	• **Section 6.14** identifies likely waste streams and management measures to provide a preliminary approach to the waste management plan**.** • Consultation is discussed in **Chapter 5.0 Stakeholder and community engagement**.
Plans and Documents	
The EIS must include all relevant plans, diagrams and relevant documentation required under Schedule 1 of the Regulation. Provide these as part of the EIS rather than as separate documents.	High quality plans and diagrams have been provided as part of this EIS.

Secretary's Environmental Assessment Requirements	Where addressed
In addition, the EIS must include high quality files of maps and figures of the subject site and proposal.	
Legislation, Policies & Guidelines	
The assessment of the key issues listed above must take into account relevant guidelines, policies, and plans as identified.	• Legislation relevant to the Project is provided in **Chapter 4.0 (Statutory context)** • Guidelines, policies, and plans relevant to the Project are summarised in **Chapter 2.0 (Strategic context)**
Engagement	
During the preparation of the EIS, you should consult with relevant local, State or Commonwealth Government authorities, infrastructure and service providers, other nearby state significant developments, community groups, affected landowners and any exploration licence and/or mineral title holders. In particular, you must undertake detailed consultation with affected landowners surrounding the development, Warrumbungle Shire Council, Dubbo Regional Council, Crown Lands, NSW Aboriginal Land Council, Transport for NSW and APA Group. The EIS must: • detail how engagement undertaken was consistent with the Undertaking Engagement Guide: Guidance for State Significant Projects (DPIE, 2024); and • describe the consultation process and the issues raised and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, an explanation should be provided.	Consultation is discussed in **Chapter 5.0 Stakeholder and community engagement**.

Appendix B

Detailed Maps and Plans



LEGEND

- PROJECT BOUNDARIES
- LOTS
- SOLAR ARRAY AREA
- CONSTRUCTION & OPERATION SUPPORT AREA
- MAIN SUBSTATION
- SECONDARY SUBSTATION
- BESS AREA
- ACCOMMODATION AREA
- HELIPAD
- ELONG ELONG ENERGY HUB
- 33kV COLLECTOR SYSTEM
- 330kV INTERNAL OHL
- ACCESS POINTS
- PUBLIC ROADS
- INTERNAL ROADS
- CREEKS

PROJECT INFORMATION:

LOCATION	-32.152188°, 149.216450°
DRAWING CO-ORDINATE SYSTEM	MGA1994, Zone 55
INVERTER COUNT	186
INVERTER TYPE	4.4MVA SMA SUNNY CENTRAL 4400UP
TOTAL PV POWER	875MWdc
TOTAL INVERTER CAPACITY (INSTALLED)	840MVA
POWER @ GRID CONNECTION	700MWac

NOTES:

1. THIS DRAWING IS PRELIMINARY.
2. COBBORA SOLAR FARM HAS SECURED LAND TENURE RIGHTS FOR ALL PRIVATE LOTS WITHIN THE PROJECT AREA.
3. CONSTRUCTION AND OPERATION SUPPORT AREA WILL INCLUDE CARPARK, WORKER'S ACCOMMODATION, CONSTRUCTION COMPOUNDS, O&M BUILDING, LAYOVER AREA, AND ANY OTHER SUPPORT BUILDING OR INFRASTRUCTURE REQUIRED.

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AMDT	AMENDMENT DETAILS	DESIGN	CHK'D	DRAWN	CHK'D	APP'D	DATE
D	FOR TENDER - UPDATES AS DIRECTED BY CLIENT	F.C.	T.H.	S.Q.	F.C.	T.H.	27/03/2025
C	FOR TENDER - UPDATES AS DIRECTED BY CLIENT	F.C.	T.H.	S.Q.	F.C.	T.H.	18/02/2025
B	FOR TENDER - GENERAL UPDATE	A.G.	T.H.	S.Q.	A.G.	T.H.	24/05/2024
A	FOR TENDER	A.G.	T.H.	S.Q.	A.G.	T.H.	22/05/2024

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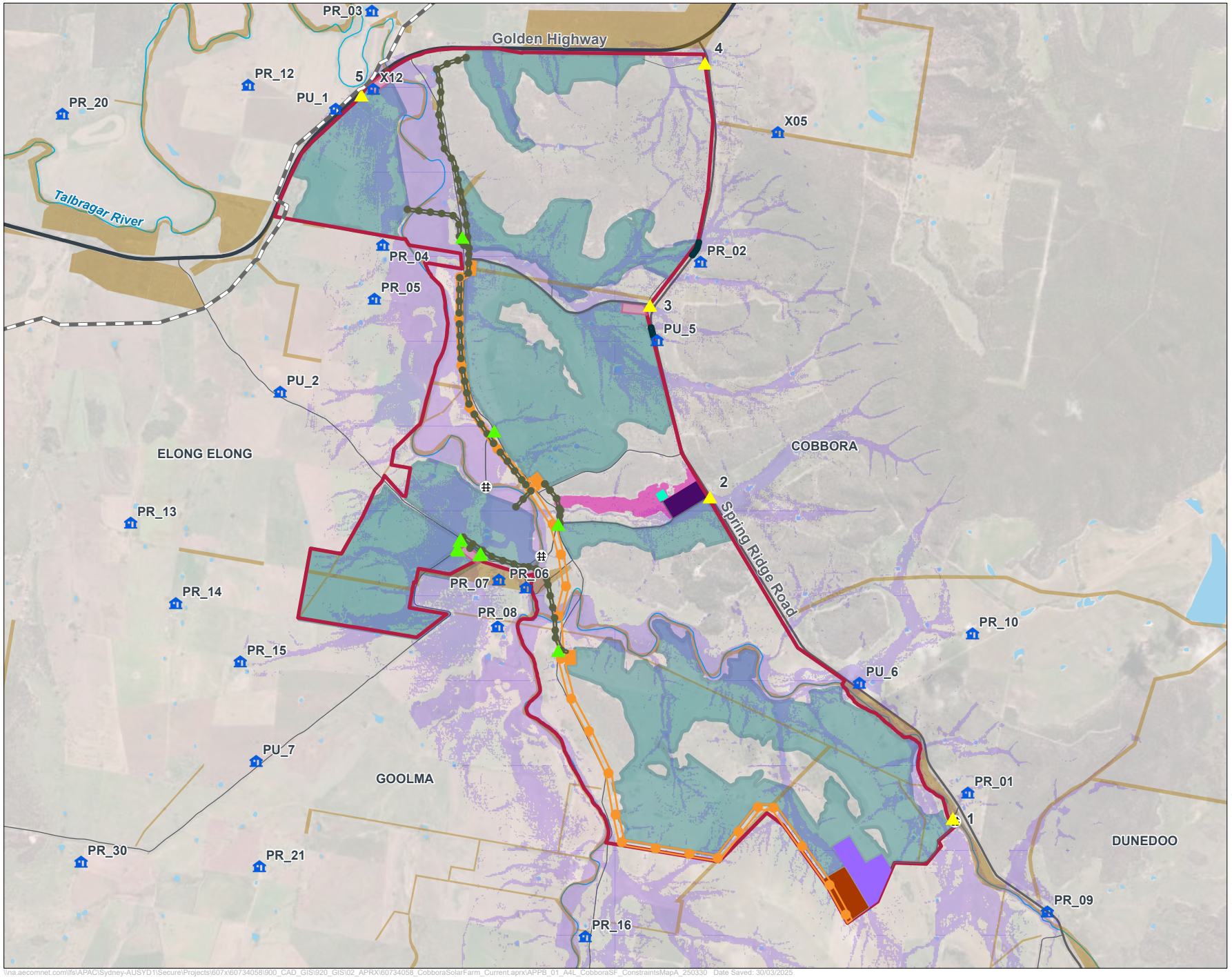
CHECKED	T.HOFFMAN
DRAWN	S.QUIGLEY
CHECKED	T.YALCINKAYA
APPROVED	T.HOFFMAN

A1 | SCALE @ A1 AS SHOWN | CONFIRM SCALE | 100mm ON A1 ORIGINAL

UGL

COBBORA SOLAR FARM
ELECTRICAL
SOLAR FARM
SITE LAYOUT

CLIENT	UGL DRAWING No.	SHEET	AMDT
PACIFIC PARTNERSHIPS	TC-18024-E3-DRG-0001	-	D



AECOM

N

0 0.5 1 km

Legend

- Project Area
- 33 kV easement
- 330 kV easement
- Solar array area
- Main construction area
- Construction areas
- Proposed tree planting locations
- BESS
- Accomodation camp
- Helipoint
- Secondary substations
- Roads
- Main substation
- Waterbody
- Crown land
- Baseline 0.01% AEP flooding
- APA high pressure gas pipeline
- Motorway
- Main road
- Local road
- Watercourses
- Primary access point
- Secondary access point
- 33 kV poles
- 330 kV towers
- Sensitive receivers
- Proposed bridges

ENVIRONMENTAL CONSTRAINTS

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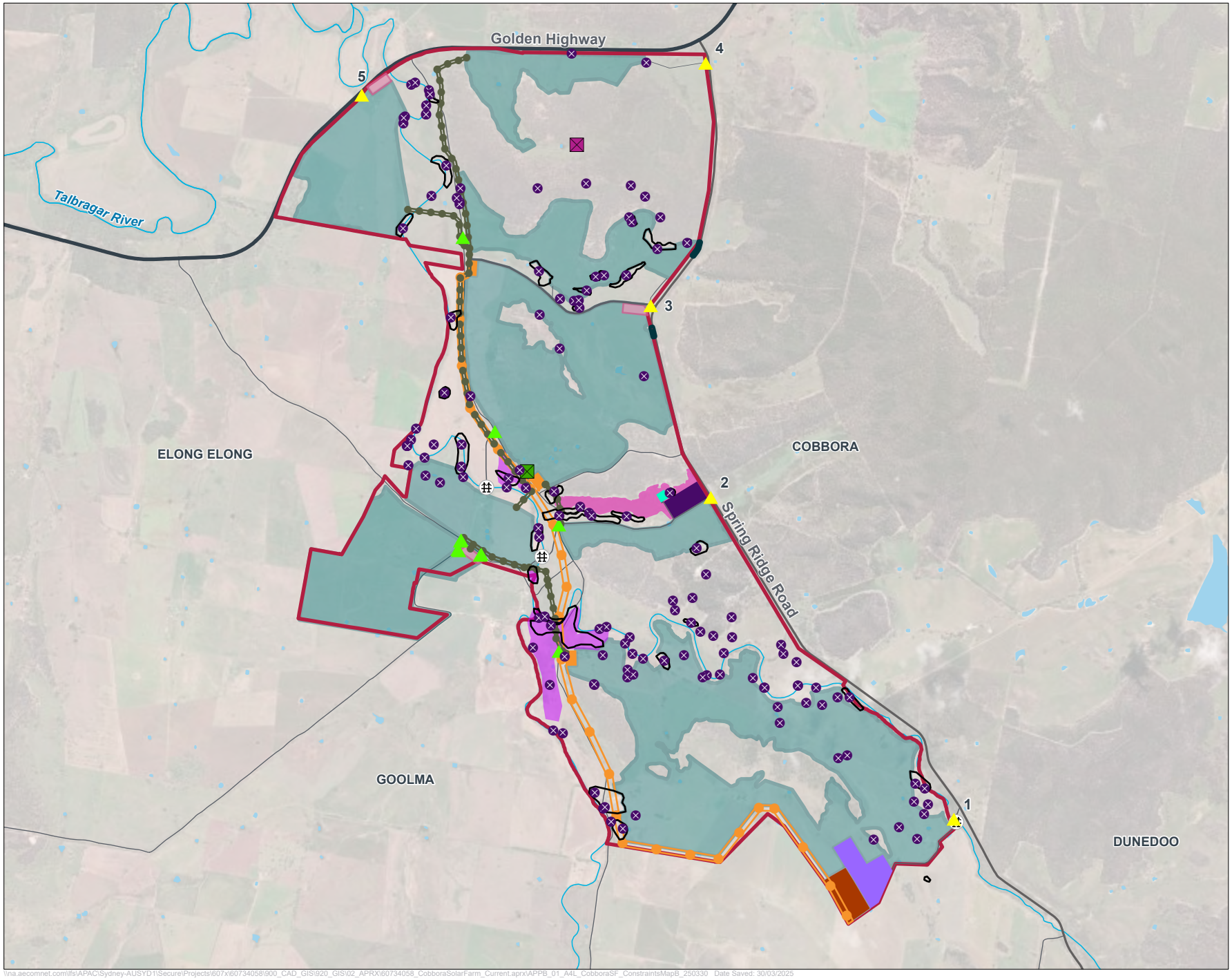
Source: Earthstar Geographics



AECOM

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- Main substation
- Waterbody
- Motorway
- Main road
- Local road
- Watercourses
- Primary access point
- Secondary access point
- Proposed bridges
- 33 kV poles
- 330 kV towers

Aboriginal heritage

- Heritage site extents
- AHIMS sites

Historic heritage sites

- House
- Seeder

ENVIRONMENTAL CONSTRAINTS

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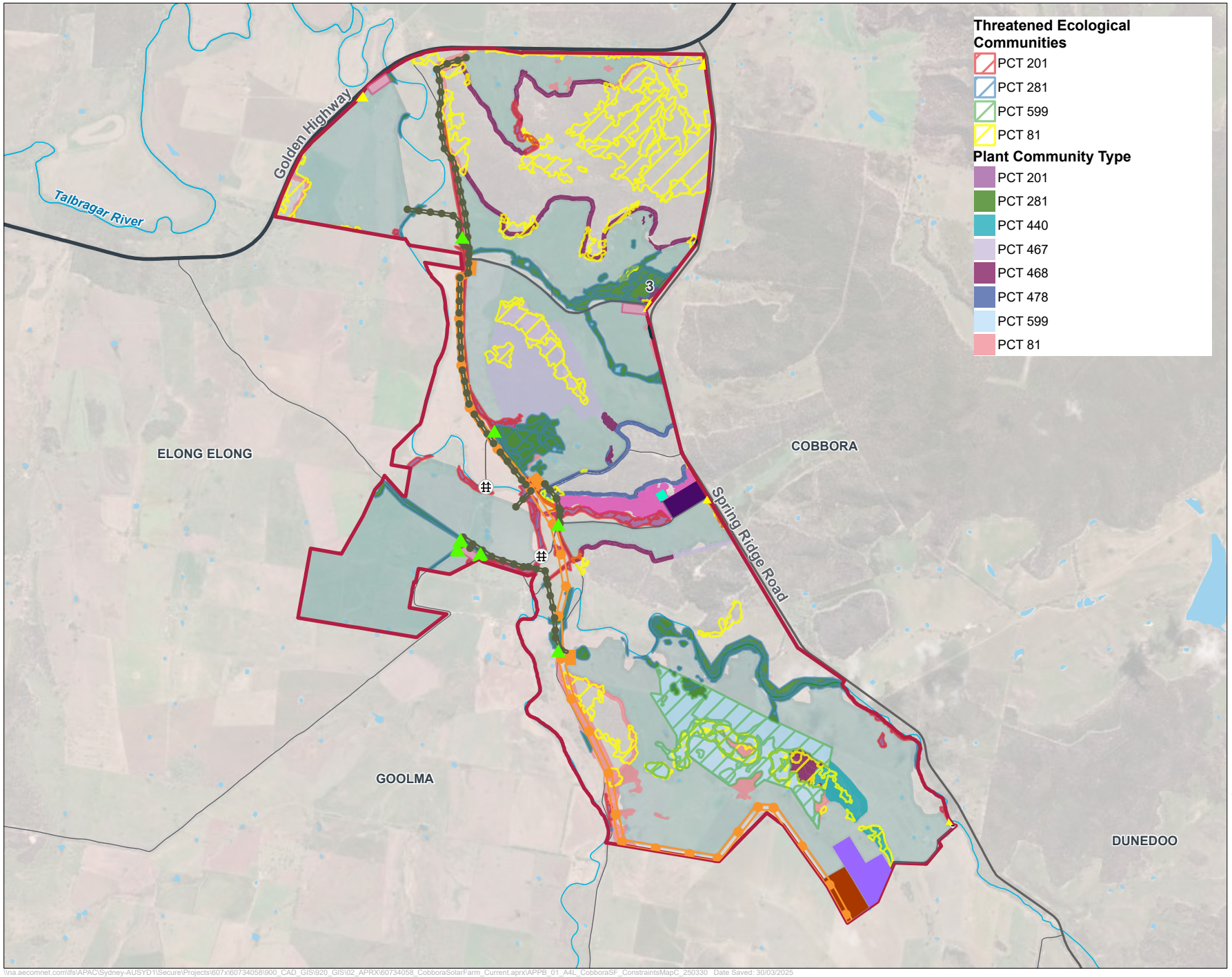

AECOM

N

0 0.5 1 km

Legend

- Project Area
- 33 kV easement
- 330 kV easement
- Solar array area
- Main construction area
- Construction areas
- BESS
- Accomodation camp
- Helipoint
- Secondary substations
- Roads
- Main substation
- Waterbody
- Motorway
- Main road
- Local road
- Watercourses
- Primary access point
- Secondary access point
- Proposed bridges
- 33 kV poles
- 330 kV towers

ENVIRONMENTAL CONSTRAINTS

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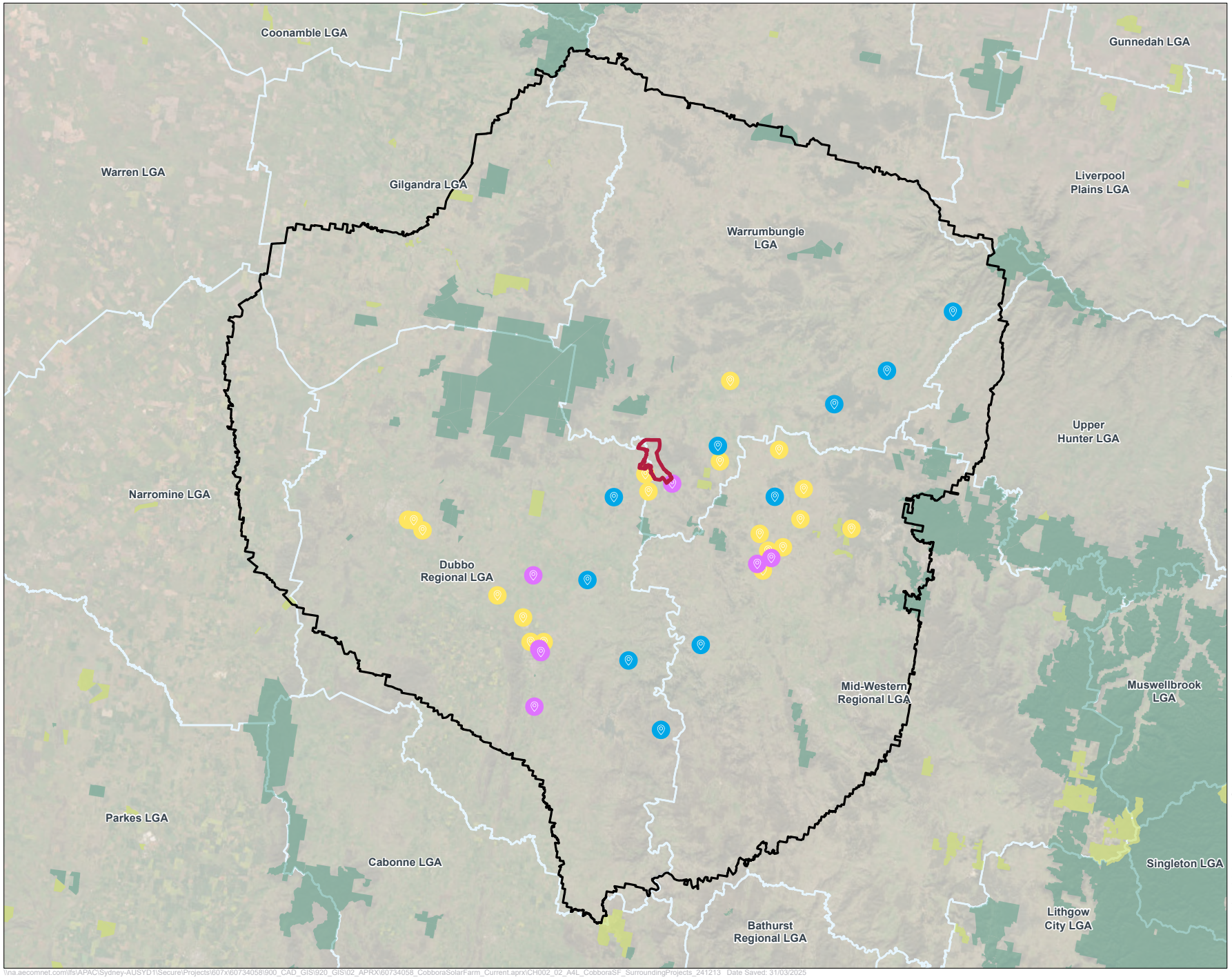

AECOM

N

0 10 20 km

Legend

- Project Area
- Central-West Orana Renewable Energy Zone
- Local government area
- State forest
- National parks and reserves
- Motorway
- Main road

Surrounding renewable projects

- Solar
- Wind
- Battery Energy Storage System

SURROUNDING RENEWABLE ENERGY PROJECTS

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Source: Earthstar Geographics

Appendix C

Statutory Compliance Table

Appendix C Statutory compliance table

Legislation	Purpose/description	Where is this addressed/ considered in the EIS
Environmental Planning and Assessment Act 1979 (EP&A Act) (NSW)	An approval is required. Approval – development consent	This EIS
Aboriginal Land Rights Act 1983 (NSW)	Not required – no active Aboriginal Land Claim over the Project Area	**Section 4.3.3** **Section 6.3** **Appendix K**
National Parks and Wildlife Act 1974 (NPW Act) (NSW)	An Aboriginal Heritage Impact Permit (AHIP) is not required for SSD projects. Potential impacts to Aboriginal objects or places will be managed through an ACHMP.	**Section 4.3.3** **Section 6.3** **Appendix K**
Water Management Act 2000 (WM Act) (NSW)	The Project is not considered to be a 'controlled activity' under section 90 and 91 of the WM Act, and therefore no approvals are required. Being SSD does not exclude the requirement for an aquifer interference approval under Section 91 of the WM Act.	**Section 4.3.3** **Section 6.10**
Protection of the Environment Operations Act 1997 (POEO Act)	An EPL is not required as the Project does not fall under the list of activities outlined in Schedule 1 of the POEO Act.	**Section 4.3.3**
Contaminated Land Management Act 1997 (CLM Act) (NSW)	The Project Area is not listed as a contaminated site under the CLM Act. Therefore, contaminated site investigations are not proposed for this EIS.	**Section 4.3.3**
Biodiversity Conservation Act 2016 (BC Act) (NSW)	An approval is required: Approval – development consent	**Section 4.3.3** **Section 6.2** **Appendix G**

Legislation	Purpose/description	Where is this addressed/ considered in the EIS
Biosecurity Act 2015	General duty to take practical and reasonable steps to prevent, eliminate, or minimise biosecurity risks.	**Section 4.3.3** **Section 6.2** **Appendix G**
Roads Act 1993	Approval for works in a road reserve is required under section 138 of the Roads Act.	**Section 4.3.3** **Section 6.8** **Appendix H**
Heritage Act 1977 (Heritage Act) (NSW)	No approval under the Heritage Act is required for SSD projects. No impacts are proposed to historic heritage items during construction or operation of the Project.	**Section 4.3.3** **Section 6.4** **Appendix L**
Aboriginal and Torres Strait Islander Heritage Act 1984 (Cth)	There are no Commonwealth or national heritage listed places within the Project Area, and as such, the heritage provisions of this Act do not apply.	**Section 4.3.4** **Section 6.3** **Appendix K**
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) (Cth)	The Project was referred under the EPBC Act (EPBC Ref: 2022/09269) and was determined to be a controlled action on 29 September 2022. Supplementary SEARs were issued detailing the requirements for the EIS. An assessment of the impacts of the Project on MNES was under as part of the BDAR.	**Section 4.3.4** **Section 6.2** **Appendix G**
Native Title Act 1993 (Native Title Act) (Cth)	A search of the National Native Title Tribunal Register confirmed that the land is not subject to a Native Title claim.	**Section 4.3.4**

Appendix D

Community Engagement Materials

Appendix D Community Engagement Materials

dailyliberal.com.au Saturday October 12, 2024 DAILY LIBERAL 11

NEWS

Jo and Craig Stewart from the Gourmet Goat Lady. Picture supplied

These cutlets are the GOAT

"THERE'S more to goat than curry."

That's the message The Gourmet Goat Lady's Jo Stewart wants people to understand about goat meat.

The Gourmet Goat Lady, which is based at Collie, has won gold at the Sydney Fine Food Awards for its smoked lamb cutlets.

"It came about because of a problem we had. Lamb racks were really, really popular but people wouldn't buy goat racks. We would eat them and fight over them - they're our favourite - but butchers were resoundingly telling us that was the piece that was left," Ms Stewart said.

Because it's smoked, the goat can be eaten cold as part of a charcuterie board, or pan friend to make it more caramelised.

Ms Stewart and her husband, Craig, try to use as much of the goat meat as possible. As well as the smoked cutlets, they also do a smoked ham, ribs - which Ms Stewart said are so good she "sucks them dry".

The Gourmet Goat Lady sells their products to local butchers and restaurants, as well as to places like the Shangri-La Sydney.

"We want to be the number one suppliers of quality goat meat in Australia. Not for the quantity wise but for quality. We want to set the benchmark," Ms Stewart said.

"The Gourmet Goat Lady name came about because I was getting rung by people and they'd say 'is this the goat lady?'."

Last year the smoked goat cutlets won silver at the food awards, and getting gold this year shows Ms Stewart they're "heading in the right direction".

- ORLANDER RUMING

COBBORA
solar farm

Cobbora Solar Farm and Battery Energy Storage System
Community Information Sessions

The Project team will be available to talk to the community and answer questions about the Project. Registration is not required, you can drop in any time.

Session One:

Date: Tuesday 22 October 2024
Venue: Elong Elong Community Hall
31 Dubbo Street, Elong Elong
Time: 4:00 pm - 6:00 pm

Session Two:

Date: Wednesday 23 October 2024
Venue: Dubbo Square Shopping Mall
177 Macquarie Street, Dubbo
Time: 9:00 am - 12:30 pm

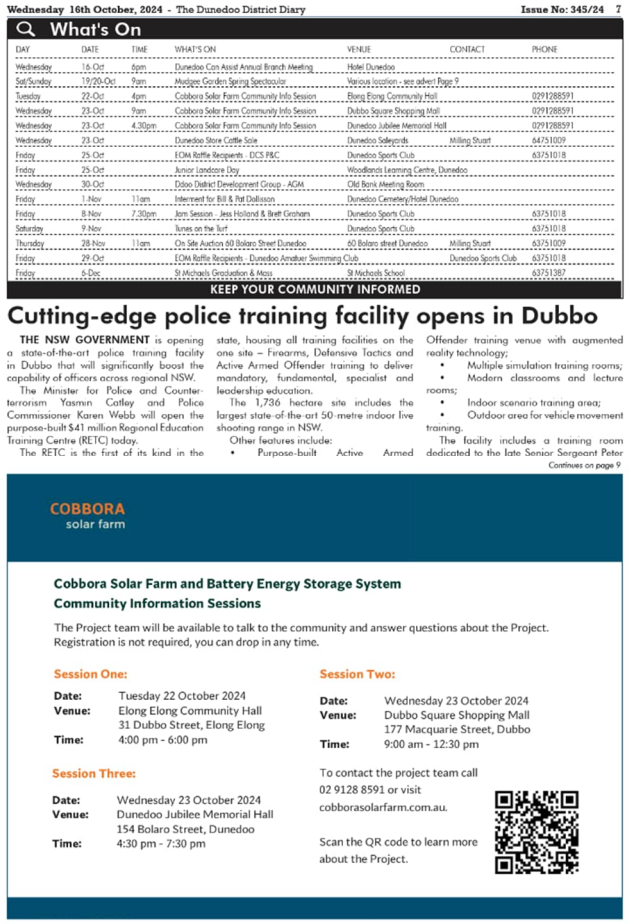
Session Three:

Date: Wednesday 23 October 2024
Venue: Dunedoo Jubilee Memorial Hall
154 Bolaro Street, Dunedoo
Time: 4:30 pm - 7:30 pm

To contact the project team call 02 9128 8591 or email contactus_cobbora@cobborasolarfarm.com.au.

Scan the QR code to learn more about the Project

Advertisement in the Dubbo Daily Liberal



Wednesday 16th October, 2024 - The Dunedoo District Diary Issue No: 345/24 7

What's On

DAY	DATE	TIME	WHAT'S ON	VENUE	CONTACT	PHONE
Wednesday	16-Oct	6pm	Dunedoo Con Assist Annual Branch Meeting	Hotel Dunedoo		
Sat/Sunday	19/20-Oct	9am	Mudgee Garden Spring Spectacular	Various location - see advert Page 9		
Tuesday	22-Oct	4pm	Cobbora Solar Farm Community Info Session	Elong Elong Community Hall		0291288591
Wednesday	23-Oct	9am	Cobbora Solar Farm Community Info Session	Dubbo Square Shopping Mall		0291288591
Wednesday	23-Oct	4.30pm	Cobbora Solar Farm Community Info Session	Dunedoo Jubilee Memorial Hall		0291288591
Wednesday	23-Oct		Dunedoo Store Cattle Sale	Dunedoo Saleyards	Milling Stuart	64751009
Friday	25-Oct		EOM Raffle Recipients - DCS P&C	Dunedoo Sports Club		63751018
Friday	25-Oct		Junior Landcare Day	Woodlands Learning Centre, Dunedoo		
Wednesday	30-Oct		Ddoo District Development Group - AGM	Old Bank Meeting Room		
Friday	1-Nov	11am	Interment for Bill & Pat Dallisson	Dunedoo Cemetery/Hotel Dunedoo		
Friday	8-Nov	7.30pm	Jam Session - Jess Holland & Brett Grohans	Dunedoo Sports Club		63751018
Saturday	9-Nov		Tunes on the Turf	Dunedoo Sports Club		63751018
Thursday	28-Nov	11am	On Site Auction 60 Bolaro Street Dunedoo	60 Bolaro street Dunedoo	Milling Stuart	63751009
Friday	29-Oct		EOM Raffle Recipients - Dunedoo Amateur Swimming Club	Dunedoo Sports Club	Dunedoo Sports Club	63751018
Friday	6-Dec		St Michaels Graduation & Mass	St Michaels School		63751387

KEEP YOUR COMMUNITY INFORMED

Cutting-edge police training facility opens in Dubbo

THE NSW GOVERNMENT is opening a state-of-the-art police training facility in Dubbo that will significantly boost the capability of officers across regional NSW.

The Minister for Police and Counter-terrorism Yasmin Catley and Police Commissioner Karen Webb will open the purpose-built $41 million Regional Education Training Centre (RETC) today.

The RETC is the first of its kind in the state, housing all training facilities on the one site – Firearms, Defensive Tactics and Active Armed Offender training to deliver mandatory, fundamental, specialist and leadership education.

The 1,736 hectare site includes the largest state-of-the-art 50-metre indoor live shooting range in NSW.

Other features include:

- Purpose-built Active Armed Offender training venue with augmented reality technology;
- Multiple simulation training rooms;
- Modern classrooms and lecture rooms;
- Indoor scenario training area;
- Outdoor area for vehicle movement training.

The facility includes a training room dedicated to the late Senior Sergeant Peter

Continues on page 9

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solar farm

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To contact the project team call 02 9128 8591 or visit cobborasolarfarm.com.au.

Scan the QR code to learn more about the Project.

Advertisement in the Dunedoo District Diary

Figure 1 Flyer in the Newspaper Advertisements

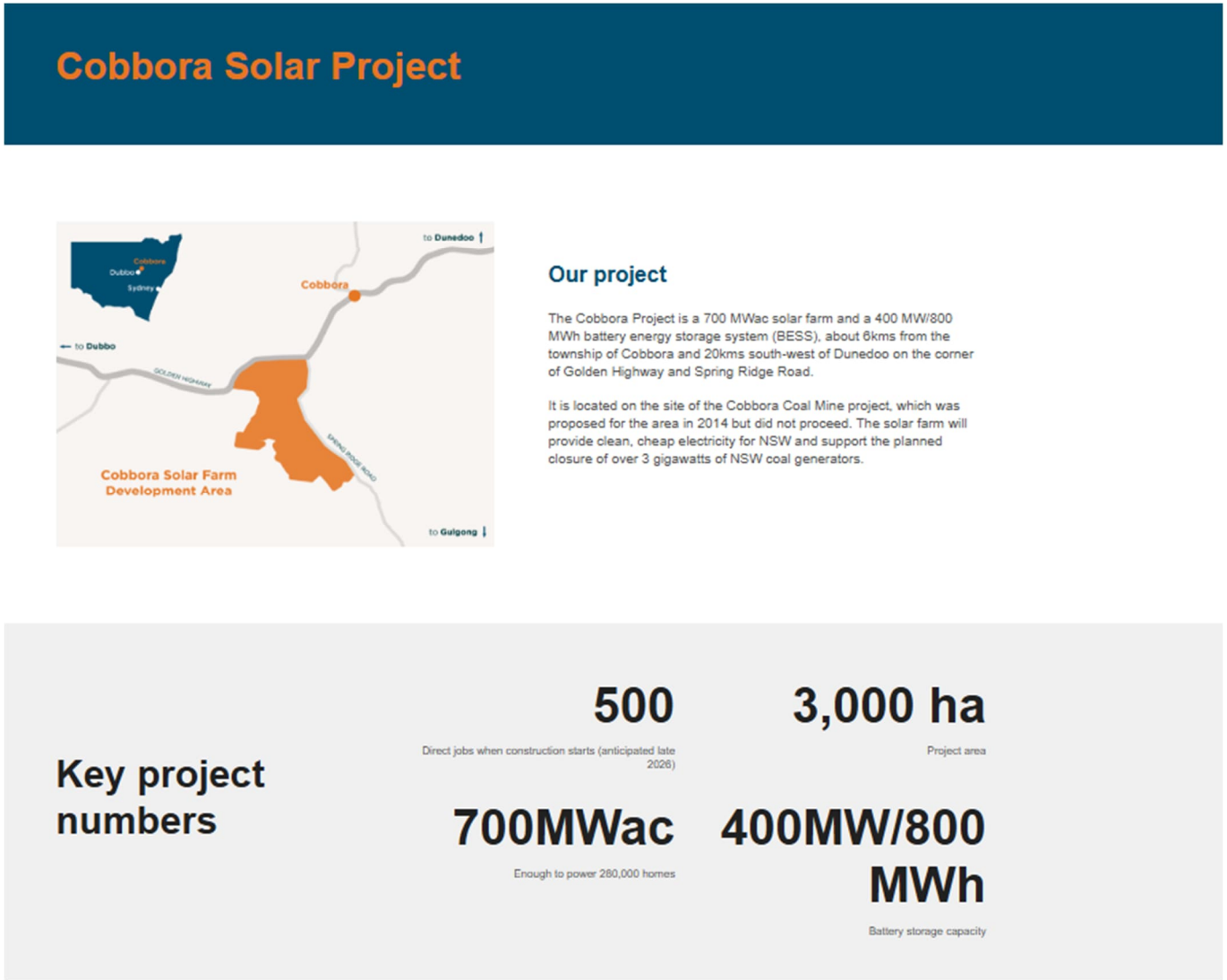

Figure 2 Website Landing Page

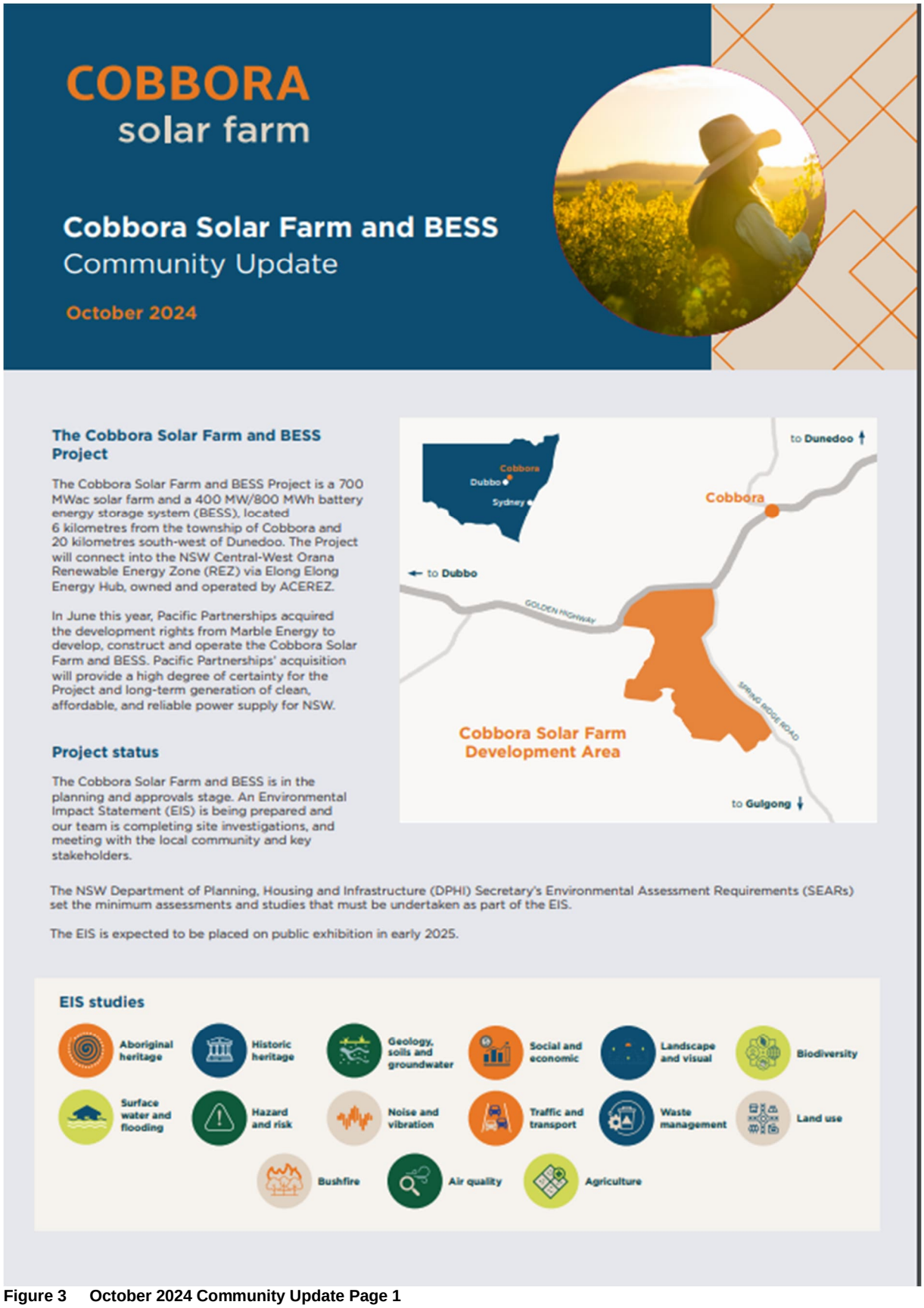

Figure 3 October 2024 Community Update Page 1

Local Benefits

The Cobbora Solar Farm and BESS will provide benefits to the local community and the region by:

- improving network reliability
- generating clean, renewable energy with a low carbon footprint
- allowing grazing to continue around the solar panels once built
- leaving a positive legacy by supporting local community initiatives and businesses
- boosting local economy by providing nearly 500 direct jobs at peak of construction

Your feedback is important

Our values are based on a commitment to being a good and responsible neighbour. That means working in partnership with the community to minimise disruption and manage impacts.

If you would like to give feedback, learn more, or have questions about the Project, please drop-in to one of the community information sessions taking place in October 2024.

Alternatively, send us your feedback or questions by:

- **Email:** contactus_cobbora@cobborasolarfarm.com.au
- **Phone**: 02 9128 8591
- **Mail:** Level 25, 177 Pacific Highway, North Sydney, NSW, 2060, Australia
- Completing the community survey on our website at cobborasolarfarm.com.au or scan the QR code. Survey closes midnight Sunday 3 November 2024.

Community information sessions

Tuesday 22 October 2024, 4pm – 6pm
Elong Elong Public Hall, 31 Dubbo Street, Elong Elong NSW 2831

Wednesday 23 October 2024, 9am – 12:30pm
Dubbo Square, 177 Macquarie Street, Dubbo NSW 2830

Wednesday 23 October 2024, 4:30pm – 7:30pm
Dunedoo Jubilee Memorial Hall, 154 Bolaro Street, Dunedoo NSW 2844

Next Steps

We are aiming for EIS exhibition in early 2025. Subject to approvals, construction will start in late 2026 with operations starting from 2030. We will keep you informed if timing changes.

About us

Pacific Partnerships is the energy development arm of the CIMIC Group, one of Australia's largest contractors. Visit our website to learn more about who we are, our approach, and values.

02 9128 8591
contactus_cobbora@cobborasolarfarm.com.au
cobborasolarfarm.com.au

COBBORA solar farm

PACIFIC PARTNERSHIPS

COBBORA
solar farm

Figure 4 October 2024 Community Update Page 2

Figure 5 Environmental Approvals Factsheet Page 1

Figure 6 Environmental Approvals Factsheet Page 2

Appendix E

Compilation of Mitigation Measures

Appendix E Compilation of mitigation measures

ID	Management and mitigation measure	Timing
General		
G1	A Construction Environmental Management Plan (CEMP) will be prepared and implemented for the Project, identifying all relevant management and mitigation measures for the construction phase as outlined in the EIS. The CEMP will include the following relevant subplans: • Aboriginal Cultural Heritage Management Plan • Agrisolar Grazing Plan • Biodiversity Management Plan • Biosecurity Management Plan • Bushfire Emergency Management and Operations Plan • Community and Stakeholder Engagement Plan • Construction Noise and Vibration Management Plan • Construction Traffic Management Plan • Emergency Response Plan • Landscape Plan • Soil and Water Management Plan • Waste Management Plan.	Construction
G2	An Operation Environmental Management Plan (OEMP) will be prepared and implemented for the Project, identifying all relevant management and mitigation measures for the operation phase as outlined in the EIS. The OEMP will include relevant subplans, such as: • Aboriginal Cultural Heritage Management Plan • Agrisolar Grazing Plan • Biodiversity Management Plan • Biosecurity Management Plan • Bushfire Emergency Management and Operations Plan • Community and Stakeholder Engagement Plan • Emergency Response Plan • Traffic Management Plan • Waste Management Plan.	Operation
G3	A Decommissioning Plan will be prepared and implemented for the Project, in line with the applicable legislative and regulatory requirements and best practice guidelines in force at that time.	Decommissioning

ID	Management and mitigation measure	Timing
G4	All employees, contractors and subcontractors working on site must undertake an environmental site induction prior to commencement of works. The detail of the induction will be developed as part of the CEMP, OEMP and Decommissioning Plan. Specific environmental aspects to be covered by the induction are outlined under respective environmental mitigation measures. Cultural awareness training will also be included as part of the induction.	Construction, Operation and Decommissioning
G5	A site plan will be included in the CEMP and will include: • Environmental constraints and exclusion zones • Extent of approved impact • Any relevant sensitive areas for avoidance (exclusion zones) • Stockpile, material laydown areas, site compounds and parking. The site plan is to be placed in an accessible location to be viewed by all site personnel (site office for example).	Construction
G6	Prior to commencement of construction activities, appropriate communication protocols will be developed to notify potentially affected residences of the Project (duration, types of works, etc.) and relevant contact details for environmental complaints reporting. These protocols will be incorporated into the Community and Stakeholder Engagement Plan.	Construction, Operation and Decommissioning
G7	A complaints logbook (or similar) will be maintained throughout construction and operation which will include all complaints and responses actioned.	Construction and Operation
G8	An Emergency Response Plan will be developed for the construction and operation phases of the Project in consultation with NSW State Emergency Services (NSW SES), Warrumbungle Shire Council and Dubbo Regional Council.	Construction and Operation
Biodiversity		
B1	Exclusion zones will be identified and delineated on site (around the woodland areas, native vegetation and threatened flora).	Construction
B2	Construction areas, not required for operational purposes, will be progressively rehabilitated following completion of construction works.	Construction
B3	Protection for fauna mortality due to entrapment within cable trenching will be minimised by: • Minimising to the extent practicable the period the trench is open • Providing opportunities for fauna to egress the trench, such as trench plugs or other appropriate mechanisms • Regular inspection of open trenches by suitably qualified personnel to remove trapped fauna as required, and prior to commencement of works if trenches were left open overnight.	Construction

ID	Management and mitigation measure	Timing
B4	A Biodiversity Management Plan (BMP) will be prepared and implemented as part of the CEMP including: • Protocols to monitor the vegetation condition and habitat values of any such retained vegetation • Plans showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features and revegetation areas • Protocols for pre-clearance inspections in areas of threatened flora by a suitably qualified ecologist. • Protocols for clearing of woody vegetation with a suitably qualified spotter/catcher present • Protocols for a suitably qualified ecologist or licensed handler to manage and handle unexpected or injured fauna • Provisions for corrective actions should a decline in vegetation or habitat condition be detected • Prescriptions for the protection and ongoing management of the occurrences of Pine Donkey Orchid within the Development Footprint. The BMP will consist of relevant subplans, including but not limited to vegetation management plan, and fauna management plan.	Construction
B5	A Biodiversity Management Plan (BMP) will be prepared and implemented as part of the OEMP including: • Protocols to monitor the vegetation condition and habitat values of any such retained vegetation • Plans showing exclusion zones, protected habitat features and revegetation areas • Provisions for corrective actions should a decline in vegetation or habitat condition be detected • Prescriptions for the protection and ongoing management of the occurrences of Pine Donkey Orchid within the Development Footprint.	Operation
B6	A protection zone will be applied for all watercourses within the Development Footprint to protect remaining riparian vegetation from being impacted by the construction and operation of the Project. Riparian corridor widths and activities permitted within those zones will be in line with the *Water Management Act 2000* (NSW) and relevant guidelines.	Construction and Operation
B7	Earthworks associated with waterway crossing construction will only take place during periods of low/no flow periods to minimise disturbance and prevent poor downstream water quality. Fish passage will be maintained throughout the construction process utilising guidance from DPI Policy and guidelines for fish habitat conservation and management (2013). Waterway crossings will be consistent with relevant guidance including the *Guidelines for watercourse crossings on waterfront land* (DPE 2022).	Construction
B8	A Biosecurity Management Plan will be prepared, including hygiene protocols, material inspections, and monitoring programs.	Construction and Operation

ID	Management and mitigation measure	Timing
Aboriginal heritage		
AH1	The proponent will develop an Aboriginal Cultural Heritage Management Plan (ACHMP), in consultation with the Registered Aboriginal Parties (RAPs) and DPHI (with input from Heritage NSW). The ACHMP will include an unanticipated heritage finds protocol, human remains protocol, and heritage inductions. The ACHMP would include protocols for the long-term management of the Aboriginal sites and/or Aboriginal objects discovered during the course of the Project. The ACHMP must be approved by the DPHI prior to salvage and construction activities occurring.	Construction and Operation
AH2	A protocol will be developed for long-term management of Aboriginal objects, in consultation with the RAPs, including: • The reburial of Aboriginal objects at a location outside of the development footprint. This could include reburying the Aboriginal objects near the location of site 36-2-0490 (Cobbora artefact reburial loc) which contains artefact recovered during previous test excavations. • Movement of the Aboriginal objects from the development footprint to a location within the site extent which will not be impacted by the Project (where applicable) or nearby to the original site location outside of the development footprint. • A RAP group (normally the LALC) nominating themselves to apply for a Care Agreement to be entered into between the RAP group and Heritage NSW.	Construction and Operation
AH3	Employees, contractors and subcontractors will be made aware during site inductions of the unanticipated heritage finds protocol, and that it is an offence under the *National Parks and Wildlife Act 1974* to harm or desecrate an Aboriginal object or an Aboriginal place unless that harm has been subject to approval as part of the necessary approvals process.	Construction
AH4	A test excavation program will be developed following detailed design and prior to construction for potentially impacted PADs, in consultation with RAPs. The methodology for the excavation will be finalised following the preparation of a written assessment methodology which will undergo consultation with RAPs following ACHCR protocols.	Detailed design and pre-construction
AH5	Where avoided sites are located within 20 m of the Development Footprint, the site will be protected during construction using high-visibility temporary fencing (such as bunting) and marked as ‘no-go’ areas on all maps. The temporary fencing must be installed prior to construction commencing and will be supervised by a qualified archaeologist and a representative from the RAPs.	Construction
AH6	A protocol for ongoing consultation with RAPs will be included in the ACHMP, outlining triggers for consultation and for obtaining agreement in relation to ACH issues arising on the Project. This protocol would be developed in consultation with the RAPs.	Construction

ID	Management and mitigation measure	Timing
AH7	Where avoidance of Aboriginal sites is not practicable, recording and salvage of information and artefacts will be undertaken. The methodology for the collection before construction in a particular area commences, will be finalised after the approvals process as part of the ACHMP, and will include the following measures: • All visible surface artefacts will be flagged in the field • The sites will be photographed after flagging and before recording • Artefact information will be recorded and photographed • An Aboriginal Site Impact Recording Form (ASIRF) will be submitted by the archaeologist detailing the salvage process at the sites.	Detailed design and Construction
Historic heritage		
HH1	A procedure will be included in the CEMP to guide the response to the discovery of any previously unknown items of heritage significance (being items of State heritage significance and/or local heritage significance) during construction. This will include guidelines on regulatory consultation, and physical management, include collection and salvage, as relevant.	Construction
HH2	The site induction will include obligations in relation to the relevant provisions of the *Heritage Act 1977* and the protection of items of heritage significance.	Construction
Geology, soil and land use		
S1	A Soil and Water Management Plan (SWMP) will be developed and implemented as part of the CEMP to address temporary and site-specific risks to sediment and erosion risk during construction and describe soil and water management measures to be implemented. The SWMP will include erosion and sediment control measures to: • Be implemented and maintained in accordance with the principles and requirements in Managing Urban Stormwater - Soils and Construction (Landcom 2004) and Volume 2A (NSW Department of Environment, Climate Change and Water 2008), commonly referred to as the “Blue Book”. • Be prepared by a suitably qualified and experienced professional. • Progressively stabilise and rehabilitate disturbed areas throughout construction.	Construction
S2	Prepare and implement an Agrisolar Grazing Plan in consultation with the landowner, in line with the Agrisolar Strategy.	Construction, Operation and Decommissioning
S3	A Decommissioning Plan will be prepared at the end of the Project’s operational life ensuring appropriate environmental management and site restoration. The Development Footprint will be rehabilitated to a condition as near as practicable to the condition that existed prior to the Project and in consultation with stakeholders and landowners.	Decommissioning
S4	If contaminated sites are uncovered during construction, the following measures will be undertaken: • Cessation of ground disturbance at the location and within the immediate vicinity. • Assessment of the site contamination and determination of appropriate remedial action.	Construction

ID	Management and mitigation measure	Timing
S5	When using water for dust suppression, the amount of water applied will not exceed what is required to effectively suppress dust. The application of water for dust suppression will: • Not cause on-site ponding or runoff • Be direct to the area being dust suppressed • Not harm vegetation surrounding the area that is being dust suppressed • Not cause visible salting.	Construction and Operation
S6	Spill kits appropriate to products used on site will be readily available and stored in all vehicles on site. As far as practicable, any spills of hazardous materials occurring on site will be rendered safe (unable to contaminate further) by construction staff as soon as possible after the event, and the site environmental representative informed immediately. The response to the spill, including any testing, treatment and/or disposal will be determined by Project environmental staff in accordance with relevant regulation and policy.	Construction and Operation
Visual		
V1	Lighting will be designed and installed in accordance with *AS4228-1997 - Control of Obtrusive Effects of Outdoor Lighting* and will follow best practice lighting principles identified within the Dark Sky Planning Guidelines (Department of Planning and Environment, 2023)	Detailed design and Construction
V2	Non-reflective surface treatments will be applied to buildings and structures where practical to minimise reflection.	Detailed design
V3	Ancillary components of the Project will be designed to minimise visual impact as much as possible.	Detailed design
V4	A Landscape Plan will be prepared and will detail strategic planting to screen views and glare in accordance with the Landscape and Visual Impact Assessment.	Construction
V5	A detailed assessment of PR_15 will be undertaken to further assess the potential cumulative visual impact associated with Dapper Solar Farm and Sandy Creek Solar Farm, and determine the additional screen planting to be implemented, in consultation with the landowner.	Operation

ID	Management and mitigation measure	Timing
Noise and vibration		
N1	The Noise and Vibration Impact Assessment prepared for the EIS (provided in **Appendix I**) will be re-evaluated based on the detailed design to confirm noise predictions and potential impacts and associated mitigation measures are still valid.	Detailed design
N2	A Construction Noise and Vibration Management Plan (CNVMP) will be prepared as a sub plan to the CEMP. The CNVMP will identify: • Potential significant noise and vibration generating activities associated with the activity, as outlined in the Noise and Vibration Impact Assessment • Noise and vibration sensitive receivers • Measures to be implemented during construction to minimise noise and vibration impacts, such as restrictions on working hours, staging, placement and operation of work compounds, parking and storage areas, temporary noise barriers, haul road maintenance and controlling the location and use of vibration generating equipment • Arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures.	Construction
N3	Sensitive receivers that are likely to be affected by Project construction noise will be notified at least five days prior to commencement of any works that may result in an adverse noise and/or vibration impact upon them. The notification will include details of: • The nature of the construction work • Construction period and construction hours • Contact information for Project staff, both on-site and off-site • Complaint and incident reporting and how to obtain further information.	Construction
N4	Construction will generally be carried out during the standard daytime working hours (as defined in the NSW Interim Construction Noise Guideline). Works generating high noise and/or vibration levels will be scheduled during less sensitive time periods.	Construction
N5	Construction activities proposed for non-standard hours (as defined in the NSW Interim Construction Noise Guideline) and unlikely to satisfy the noise criteria at nearby sensitive receivers will be conducted with approval from relevant authorities and in consultation with affected landholders, except during an emergency where works would be undertaken without consultation.	Construction
N6	High noise generating work (>75 dB(A) L_{Aeq} at receiver) carried out during standard construction hours will be in continuous blocks of no more than three hours with at least one hour respite between each block, where the location of the work is likely to impact the same receiver.	Construction

ID	Management and mitigation measure	Timing
N7	Where high noise generating activities (>75 dB(A) L_{Aeq} at receiver) are required out of standard working hours: • These works will be scheduled before 10:00 pm, where feasible and reasonable • Where the above cannot be achieved, no works will occur after midnight.	Construction
N8	For deliveries to and from the Project Area: • Loading and unloading of materials/deliveries will occur in designated loading or unloading points. Where this is not feasible loading and unloading will take place in areas away from sensitive receivers as far as practicable • Construction sites near sensitive receivers will be designed to minimise the need to reverse vehicles (and hence trigger reversing alarms)	Construction
N9	Non-tonal reversing beepers (or an equivalent mechanism) will be fitted and used on all construction vehicles and mobile plant regularly used on site.	Construction
N10	Consideration will be given to the layout of construction compounds (positioning of site sheds, earth bunds and hoarding) to maximise distance and shielding of fixed and mobile plant and truck movements to nearby receivers.	Detailed design and Construction
N11	Vibration intensive equipment size will be selected to avoid working within the structural damage minimum working distances. The use of less vibration intensive methods of construction or equipment will be considered where feasible and reasonable.	Detailed design and Construction
N12	Where vibration intensive works cannot be avoided within minimum working distances, vibration monitoring should be undertaken to determine site specific minimum working distances and to ensure that appropriate thresholds are not exceeded.	Detailed design and Construction
Traffic and transport		
T1	A Construction Traffic Management Plan (CTMP) will be prepared as a sub plan to the CEMP, and in consultation with Warrumbungle Shire Council, Dubbo Regional Council and Transport for NSW. The CTMP will include a Drivers Code of Conduct and will be designed to minimise the impact of Project construction traffic (including OSOM vehicles) on the external road network.	Detailed design and Construction
T2	A Traffic Management Plan will be prepared, as required, prior to large-scale maintenance activities with the potential to impact traffic.	Operation
T3	Where required, Project accesses will be upgraded to a Typical Rural Property Access standard in consultation with Transport for NSW, Warrumbungle Shire Council and Dubbo Regional Council.	Detailed design and Construction
T4	Vehicle access to and from the Development Footprint will be via the designated access points (unless agreed with the relevant road authority). Access points will be designed and managed to minimise safety risks to motorists and other road users.	Construction

ID	Management and mitigation measure	Timing
T5	All trucks will enter and exit the Development Footprint in a forward direction. Provision will be made within the Development Footprint to allow vehicles to turn around without the need for reversing.	Detailed design and Construction
T6	Appropriate signage, line marking and/or traffic control measures will be used near access points to direct and guide motorists past the Project Area, if required.	Detailed design and Construction
T7	Sufficient designated parking will be provided within the Development Footprint for all construction vehicles (light and heavy vehicles), and no parking or storing of materials will occur on the public road network in the vicinity of the Project Area.	Construction
T8	A maximum speed limit of 20 km/h will be enforced throughout the Development Footprint.	Construction
T9	An independent dilapidation survey will be undertaken to assess the condition of the pavement and drainage and bridge structures along the proposed construction route(s) (between the Golden Highway/Spring Ridge Road intersection and site access points) prior to and following construction or decommissioning activities.	Construction
T10	Over-dimensional vehicles will only travel to the Project once an Over Size Over Mass (OSOM) Permit from the National Heavy Vehicle Regulator and any required approvals/permits from the relevant road authorities have been obtained.	Construction
T11	A Traffic Management Plan specific to the decommissioning phase will be prepared prior to decommissioning which reflects changes in background traffic volumes and work procedures, and in consultation with Warrumbungle Shire Council, Dubbo Regional Council and Transport for NSW.	Decommissioning
T12	The Central West Cycling Trail (CWCT) route will be highlighted within the site induction and driver's code of conduct to increase awareness of cyclists' presence in the area. Drivers will be instructed to respect the safety of cyclists using local and regional roads, including complying with legal passing separation distances.	Construction

ID	Management and mitigation measure	Timing
Flooding		
F1	Site planning during detailed design will: • Adopt appropriate placement of temporary works, plant, materials and workforce facilities, giving due consideration to overland flow paths and mainstream flood risk • Ensure that temporary works minimise offsite flooding impacts as far as practical.	Detailed design
F2	Waterway crossings will be designed and constructed to: • Consider the appropriate level of serviceability and flood immunity required for the Project • Consider local hydraulic conditions and minimise scour potential • Minimise local flooding impacts • Be consistent with all relevant guidelines including the *Guidelines for watercourse crossings on waterfront land* (DPE 2022) and *Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway* Crossings (Fairfull, S. and Witheridge, G. 2003)	Detailed design and Construction
Surface water, groundwater and water use		
W1	The use of bore water during construction and operation would be agreed with bore water users in the area. A Water Access Licence (WAL) would be obtained prior to extraction commencing if required.	Construction and Operation
W2	A Water Sourcing Strategy will be developed and included as part of the CEMP. This will: • Identify suitable water sources to support construction activities. This will be undertaken in consultation with water suppliers and • Aim to minimise impacts to the water supplies of adjacent landowners and/or other relevant stakeholders during construction	Detailed design
W3	Potable water storages will be managed and maintain in accordance with the Australian Drinking Water Guidelines (ADWG) (National Health and Medical Research Council, 2011).	Construction and Operation
W4	Wastewater generated by amenities will be collected in tanks and periodically removed by a suitably licensed waste contractor. During operation wastewater will be managed by either collection in tanks and periodic removal by a suitably licensed waste contractor or by the use of a small on-site aerated wastewater treatment system.	Construction and Operation
W5	Waterway crossings will be designed and constructed to: • Consider the appropriate level of serviceability and flood immunity required for the Project • Consider local hydraulic conditions and designed to minimise scour and erosion potential • Minimise local flooding impacts • Be consistent with relevant guidance including the *Guidelines for watercourse crossings on waterfront land* (DPE 2022) and *Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway* Crossings (Fairfull, S. and Witheridge, G. 2003).	Detailed design and Construction

ID	Management and mitigation measure	Timing
W6	A bore census will be undertaken to confirm if the Cobbora mine exploration bores have been decommissioned, repurposed, or could be used for water supply.	Detailed design
W7	Groundwater drawdown impacts to landholder bores will be assessed using test production bores. Information will support development of the Water Sourcing Strategy.	Detailed design
Hazard and risk		
HR1	Solar farm equipment and systems will be designed and tested to comply with the relevant Australian Standards and Codes and/or with at least one major International Code.	Detailed design
HR2	The BESS will be certified under internationally recognised test methods such as the Underwriters Limited (UL) 9540A Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage System.	Detailed design
HR3	An electrical isolation protocol will be put in place during construction as well as during commissioning and operation of the electrical equipment.	Detailed design, Construction and Operation
HR4	Preventative maintenance practices will be put in place, including maintenance schedules and calibration of equipment, instruments and sensors, APZ, vegetation control within the Development Footprint, and Non-Destructive Testing as recommended by manufacturer(s).	Operation
HR5	Warning signs will be installed and maintained as per Code and Standards requirements, including Dangerous Goods signage and High / Medium voltage warnings (including arc flash).	Detailed design, Construction and Operation
HR6	Earthing of electrical equipment will be established.	Detailed design and Construction
HR7	Lightning protection will be determined in accordance with Australian Codes at the detailed design stage. This protection will be implemented into the design and constructed.	Detailed design and Construction
HR8	The BESS and high voltage equipment will be housed within a secure fenced area. On-site security protocols will be developed and implemented.	Detailed design, Construction and Operation
HR9	The risk of seismic activity, dust storm and severe winds will be integrated into the design of the BESS, through the application of the relevant Australian Standards.	Detailed design
HR10	The detailed design for the Project will consider the ARPANSA Standard (2016) and ICNIRP guideline (2020) [as part of the electrical design.	Detailed design
HR11	Procedures in relation to high voltage installation and operation will be adhered to throughout the life of the Project.	Construction and Operation

ID	Management and mitigation measure	Timing
HR12	Public access to the work areas within the Development Footprint will be restricted throughout the life of the Project and all facilities will be kept locked.	Construction and Operation
HR13	The Preliminary Hazard Analysis prepared for the EIS (provided in **Appendix M**) will be re-evaluated based on detailed design to ensure that aspects considered (i.e. control measures, clearances between BESS units, separation distance) and associated mitigation measures are still valid.	Detailed design
Bushfire		
BF1	Fire protection at the BESS will be determined during detailed design and in consultation with FRNSW and RFS	Detailed design
BF2	The Development Footprint will be progressively managed in accordance with NSW Rural Fire Service's Standards for Asset Protection Zones (APZ) and Appendix 4 of 'Planning for Bushfire Protection 2019'.	Construction and Operation
BF3	Vulnerable buildings and/or critical assets would be constructed in accordance with 'Planning for Bushfire Protection 2019' and AS3959.	Detailed design and Construction
BF4	All internal tracks and trails are to be constructed and maintained to a minimum standard suitable for Category 1 Tanker operation per the RFS NSW Fire Trail Standards (2023).	Detailed design and Construction
BF5	A Fire Safety Study (FSS) will be prepared in accordance with HIPAP No. 2 Fire Safety Study Guidelines (DoP, 2011) in consultation with FRNSW. The FSS will determine the requirements for any fire safety systems (e.g. provision of fire water tanks and hydrant booster sets) on site during construction and operation.	Detailed design
BF6	A Bushfire Emergency Management and Operations Plan (BEMOP) is to be developed prior to the commencement of construction/operation and in consultation with local emergency services. This is to include a Bushfire Emergency Response Plan (BERP) sub-plan and a site specific pre-incident plan (PIP). The bushfire evacuation procedures within the BEMOP would be prepared in accordance with the *Guide to Developing A Bushfire Emergency Management Plan* (NSW Rural Fire Service, 2014).	Construction and Operation
Socio-economic		
SE1	A Community and Stakeholder Engagement Plan will be prepared to foster consistent, transparent and proactive consultation with nearby and adjacent landholders, local councils, the local Aboriginal community, Project RAPs and other key stakeholders. This will include: • methods for collaboration and coordination with relevant stakeholders in responding to community issues relating to REZ establishment • methods and timing for connecting with the community, and principles that would be applied to the engagement • guidance on communication protocols with nearby residents to share information and generate awareness about construction activities and potential periods of disruption, including a responsive and easy-to-access community grievance mechanism.	Construction, Operation and Decommissioning

ID	Management and mitigation measure	Timing
SE2	An Aboriginal participation plan (APP) will be developed in consultation with First Nations stakeholders to optimise local capacity and aspirations through targeted participation initiatives within the regional area. The APP would sit under the Proponent's Industry and Aboriginal Participation Plan (IAPP). The IAPP would be contractually binding upon award of Access Rights. Agreed commitments will be measurable, and a report of progress to the local First Nations community would contribute to the measurement of outcomes.	Construction and Operation
SE3	An Accommodation, Employment and Procurement Strategy (AEPS) will be developed in consultation with Warrumbungle Shire Council and Dubbo Regional Council. The AEPS will include targeted measures to maximise local employment and sourcing from local communities such as training, up-skilling and capacity building support, in collaboration with local stakeholders and training providers.	Construction
SE4	The recruitment of local workers for the construction workforce will be maximised where possible.	Construction
SE5	In relation to health services, engagement with Dubbo Regional Council and Warrumbungle Shire Council will be undertaken to identify potential service limitations.	Construction
SE6	A Community Shared Benefit Strategy (CSBS) will be developed in collaboration with Warrumbungle Shire Council and Dubbo Regional Council in accordance with the Benefit-Sharing Guidelines (DPHI, 2024).	Construction and Operation
Other issues – waste		
OW1	A Waste Management Plan (WMP) will be developed and implemented outlining the measures and strategies to be implemented on site to manage, reuse, recycle and safely dispose of waste.	Construction and Operation
OW2	All waste would be assessed, classified, managed and disposed of in accordance with the Waste Classification Guidelines (NSW EPA, 2014). Where appropriate, a waste classification letter will be prepared to allow for materials to be disposed off-site to a licensed landfill in accordance with NSW EPA guidelines.	Construction
OW3	On-site waste management will include the appropriate separation and storage of waste streams to enable recycling and reuse wherever possible to reduce associated environmental impacts and impact to the capacity of local waste management facilities.	Construction
OW4	Wood pallets will be reused if in good condition, returned to the supplier if practicable, or sold for wood chip if damaged or recycled.	Construction
OW5	Hazardous waste (e.g. waste oil, paint, septic wastewater, asbestos, etc) will be collected by a licenced waste contractor for disposal at a licenced facility.	Construction and Operation
OW6	Portable toilet facilities will be available for construction workers within the Development Footprint.	Construction
OW7	All generated and regulated waste records will be retained for waste tracking purposes.	Construction

ID	Management and mitigation measure	Timing
OW8	Solar panels will be recycled at all stages of the project. If required, investigations into waste and recycling options in broader NSW would be undertaken to ensure there is capacity at facilities to support the Project.	Construction, Operation and Decommissioning
OW9	A Waste Management Plan will be prepared as part of the Decommissioning plan will have a WMP.	Decommissioning
OW10	The Proponent will engage with EnergyCo and other developers on a strategy to minimise impact to local waste facilities, where possible.	Construction, Operation and Decommissioning
Other issues – air quality		
OA1	Equipment engines will be properly maintained and switched off when not in use for prolonged periods, where practicable.	Construction
OA2	Working practices (location and scale of activities which generate dust emissions) will be modified during periods of adverse weather (hot, dry, and windy conditions)	Construction
OA3	Vehicle loads entering and leaving sites will be covered to prevent escape of materials during transport.	Construction