Environmental Impact Statement

Calala Battery Energy Storage System

SSD-52786213

57 Burgess Lane, Calala

also known as 474 Calala Lane, Calala

PREPARED FOR EQUIS ENERGY (AUSTRALIA) PROJECTS (NGUMI 4) PTY LTD
AS TRUSTEE FOR EQUIS ENERGY (AUSTRALIA) NGUMI 4 ASSET TRUST

OCTOBER 2023
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REVISION	REVISION DATE	STATUS	AUTHORISED: NAME & SIGNATURE
REV A	29 August 2023	DRAFT	Adam Coburn 
REV B	1 September 2023	FINAL	Adam Coburn 
REV C	3 October 2023	FINAL	Adam Coburn 

* This document is for discussion purposes only unless signed and dated by the persons identified.
This document has been reviewed by the Project Director.

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EIS Declaration

PROJECT DETAILS	
Project Name	Calala BESS
Application Number	SSD-52786213
Project Address	• 57 Burgess Lane, Calala (also known as 474 Calala Lane, Calala) – Lot 17 DP629969 • 57 Burgess Lane, Calala – Lot 16 DP629969 • Burgmanns Lane, Calala – Lot 3 DP244399 • Burgess Lane, Calala – Lot 4 DP244399 • 707 Burgmanns Lane, Calala – Lot 6 DP219993
APPLICANT DETAILS	
Applicant	Equis Energy (Australia) Projects (Ngumi 4) Pty Ltd (ABN: 80 353 224 865) as trustee for the Equis Energy (Australia) Ngumi 4 Asset Trust
Applicant Address	36 Esplanade, Brighton, Melbourne, VIC 3186
DECLARATION BY REGISTERED ENVIRONMENTAL ASSESSMENT PRACTITIONER (REAP)	
Name	Adam Coburn
Address	Level 2, 3 Horwood Place, Parramatta NSW 2150
Professional Qualifications	M. Planning, B. Environmental Planning, RPIA
Registration number	10163
Registration Organisation	Planning Institute Australia
Declaration	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	3 October 2023

Executive Summary

Purpose of report

This Environmental Impact Statement (**EIS**) has been prepared on behalf of Equis Energy (Australia) Projects (Ngumi 4) Pty Ltd (ABN: 80 353 224 865) as trustee for the Equis Energy (Australia) Ngumi 4 Asset Trust (**Equis**) to accompany a State Significant Development application (**SSDA**) (SSD- 52786213) for a standalone battery energy storage system (**BESS**) with storage capacity up to 300MW and 1200MWh discharge capacity, and connection to the existing Tamworth substation via underground transmission cable, and ancillary works. The primary project address is 57 Burgess Lane, also known as 474 Calala Lane, Calala (Lot 17 DP629969), but the development also includes works on portions of Lot 16 DP629969, Lot 3 DP244399, Lot 4 DP244399, and Lot 6 DP219993 (**the site**).

The project is characterised as State Significant Development as the proposal is for the purpose of electricity generating works with a capital investment value in excess of $30 million, pursuant to Section 20 of Schedule 1 of *State Environmental Planning Policy (Planning Systems) 2021*. This SSDA is made and submitted to the Minister for Planning under Part 4, Division 4.7 of the Environmental Planning and Assessment Act 1979 (**EPA Act**), and this EIS has been prepared in accordance with Part 8, Division 5 of the *Environmental Planning and Assessment Regulation 2021* (**EPA Regulation**).

The Department of Planning and Environment (**DPE**) issued the Secretary's Environmental Assessment Requirements (**SEARs** SSD-52786213**)**) for the project on 30 January 2023. This EIS has been prepared in response to the project SEARs.

Overview of the proposal

The BESS site is approximately 36.24ha in area and has a frontage of approximately 420m to Calala Lane. The surrounding development to the north, east, and south consists largely of agricultural uses and primary production, as well as residential dwellings situated on large allotments.

The proposed development seeks consent for a battery energy storage system with storage capacity up to 300MW and 1200MWh discharge capacity. The plans prepared for the development are provided in **Appendix E** of this EIS. The key components of the development comprise the following:

- Site establishment including earthworks and installation of erosion and sediment control measures,
- Construction of a BESS with storage capacity up to 300MW and 1200MWh discharge capacity comprising the following:
    - Battery modules,
    - Substation,
    - Inverter stations,
    - Distribution kiosks,
    - Control rooms and switchroom, and
    - Warehouse
- Installation of an underground transmission cable from the BESS to the Transgrid 330kV Tamworth substation,
- Vehicular access from Calala Lane,
- Tree removal and landscaping works, and
- Installation of a noise barrier on the northern and western elevations and security fencing.

The BESS will operate 24 hours a day, 7 days a week. The project will be operated remotely with occasional maintenance activities undertaken between 7am and 6pm Monday to Friday or 8am to 1pm Saturday, with no work undertaken on Sunday or public holidays (except where urgent emergency maintenance is required).

Project background and need

The Project was initiated after a comprehensive assessment of electrical supply and demand across NSW, which included a review of *AEMO's 2022 Integrated System Plan* (**AEMO 2022 ISP**) and future demand expectations.

Once a suitable substation had been identified (i.e., Tamworth Substation), Equis carried out a constraints and opportunities assessment for all land within 2km of the substation. This included a review of flora and fauna constraints, existing land use and zoning, distance from dwellings, land availability, transmission line availability, and flooding. This assessment also included a review of the strategic planning objectives of Tamworth and Calala to ensure the site was not identified as being needed for future urban growth.

Once a suitable site was identified, the applicant engaged specialist consultants to design the facility and carry out detailed assessments of environmental, economic and social impacts. This process has led to the project as presented in this EIS.

The following key strategies have been adopted to avoid, minimise or offset the impacts of the project:

- locate the facility away from sensitive receivers;
- provide suitable acoustic screening around the facility;
- provide suitable landscape screening around the facility;
- provide suitable Asset Protection Zones around the facility; and
- implement appropriate management measures during construction and operation.

Consultation

Pre-lodgement consultation was conducted with various stakeholders including Tamworth Regional Council, the Department of Planning and Environment, adjoining and surrounding landowners, and local Aboriginal stakeholders. Comments provided by these stakeholders have been instrumental in the preparation of the EIS. Section 5 describes the consultation activities undertaken.

Planning context

The EIS has been prepared in accordance with the relevant legislative requirements of the EPA Act and *Environmental Planning and Assessment Regulation 2021* (**the Regulation**). Section 4 of the EIS considers all applicable legislation in detail.

State Environmental Planning Policy (Planning Systems) 2021 (**Planning Systems SEPP**) nominates certain types of development as SSD. Under Clause 20 of Schedule 1 of the Planning Systems SEPP, development for the purpose of electricity generating works with a Capital Investment Value (**CIV**) of greater than $30 million is categorised as SSD. The proposed BESS has a CIV in excess of $30 million and is therefore classified as SSD.

Tamworth Local Environmental Plan 2010 (**TRLEP**) applies to the site. The site is zoned RU4 Primary Production Small Lots under the TRLEP. *Electricity generating works* are permissible in the zone with consent. The proposal is consistent with all other provisions of the LEP.

Environmental impacts and mitigation measures

Section 6 of the EIS provide an assessment of the environmental impacts of the proposal in accordance with the SEARs. A range of mitigation measures have been recommended based upon the input of specialists. Appendix D of the EIS sets out a summary of the mitigation measures. Subject to the implementation of the identified mitigation measures, the potential environmental impacts of the proposal will be acceptable and manageable. The key matters considered are briefly discussed below.

<u>Biodiversity</u>

The direct impacts of the project on biodiversity include vegetation clearing as a result of the BESS, transmission line, roads, and other physical works. The direct impacts include the removal of 1.33 ha of *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 (BC Act) and White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (EPBC Act)*, 0.06 ha of native vegetation comprising PCT

84_DNG, and 1.08 ha of habitat for Bluegrass, Finger Panic Grass, Belson's Panic, Hawkweed and Austral Toadflax (which are assumed to be present).

The risk to nearby vegetation and habitats is generally considered to be very low. The risk is mitigated by containing construction within clearly defined boundaries and using trenchless construction methods in the PCT 599_Woodland, which has the highest degree of native vegetation and biodiversity values. Although indirect impacts from the BESS development such as noise, light, and dust spill may impact areas of native vegetation and high biodiversity values, significant impacts such as the inadvertent clearing of PCT 599_Woodland are considered to be unlikely.

To mitigate the impacts on biodiversity, the bulk of the BESS development is situated on Category 1 land. Furthermore, the development will implement a Construction Environmental Management Plan (**CEMP**) that will include measures to monitor predicted and uncertain impacts to allow for adaptable, effective, and prompt responses. Where the impacts on biodiversity cannot be avoided or minimised, the appropriate offsets are provided, comprising 29 ecosystem credits and 86 species credits.

Aboriginal Heritage

A study to determine the Aboriginal heritage significance of the development site and surrounds was undertaken in accordance with the *Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW*, the Burra Charter, and the *Guide to Investigating and Reporting on Aboriginal Heritage*. The site did not reveal any aboriginal sites or objects. Consultation with the Aboriginal community revealed that the study area has high cultural significance. However, the background research and survey confirmed that the study area has been heavily disturbed by previous and current land uses. The ACHA concludes that there is “no archaeological significance within the study area”.

However, a heritage induction ‘unexpected find procedure’ will be implemented for all workers on development to ensure a standard procedure is followed in the event that an Aboriginal artefact is found. Moreover, the applicant will continue to inform the registered Aboriginal parties about the management of Aboriginal cultural heritage sites for the life of the project.

European Heritage

The site is not known to contain any evidence of items, activities, or events occurring within the study area that are historically significant, either to the local area or NSW. Archaeological remains that may be present within the study area are likely to include fence lines, post holes, agricultural marks and farming sheds which hold no research potential and are unlikely to provide information that is of importance in the pattern of NSW’s cultural history at a state or local level. The study area is not associated with a significant figure or community group within the local area and possesses low aesthetic value due to disturbances.

However, should unanticipated historical archaeology be discovered during the course of the project, work in the vicinity must cease and an archaeologist contacted to make a preliminary assessment of the find. Heritage NSW will require notification if the find is assessed as a relic.

Land Use Conflict

The area is presently utilised for horse grazing and comprises mostly of cleared rural land. The land in the surrounding areas is mainly occupied by rural residential properties, with some areas being used for extensive agriculture and public use, and some irrigated crop farming on the Peel River flats. Calala village is situated 500m to the west along Calala Lane. The most prominent land use in the vicinity is rural residential.

Unlike typical agricultural land use, which can present various issues like noise, odour, spray drift, dust, surface water and sediment runoff, traffic and access, and visual impact, the BESS poses few specific conflicts. These conflicts are limited to noise emissions and visual impact. The acoustic impact mitigation measures employed include noise attenuation walls on the north and western boundaries, and the visual impact mitigation measures include using a colour palette for the BESS that blends in with the rural landscape as well as the use of landscaping.

Soils

A soil survey was undertaken to determine the soil characteristics of the site, survey results are discussed in the Land and Soil Capability Assessment (LSCA) prepared by ENV Solutions in Appendix W of this EIS. The LSCA considers the various biophysical features of the land and soil including slop, drainage, climate, landform, soil types and soil characteristics against a range of land and soil hazards. The hazards include wind erosion, soil erosion, soil structure decline, soil acidification, salinity, waterlogging, shallow soils and mass movement. These hazards are given a Land and Soil Capability (LSC) class rating between 1 and 8, with 1 being the highest capability and 8 being the lowest capability.

Based on an assessment of each of the hazards, the site has a Land and Soil Capability rating of 4 which is defined by the Office of Environment and Heritage as:

"Moderate capability land: Land has moderate to high limitations for high-impact land uses. Will restrict land management options for regular high-impact land uses such as cropping, high-intensity grazing and horticulture. These limitations can only be managed by specialised management practices with a high level of knowledge, expertise, inputs, investment and technology."

The LSCA also considers the Biophysical Strategic Agricultural Land (BSAL) classification of the site based on the Central Recourse for Sharing and Enabling Environmental Data in NSW (SEED). Based on a review of the information available from SEED, the site is not classified as BSAL. The site is not considered fertile land and has a moderate to high limitation for high impact agricultural uses.

Landscape Character and Visual Impact

The site is identified as having a low sensitivity to being visually impacted by the BESS, as the site is not located in a designated scenic landscape area and is not recognised as having national or regional scenic landscape value. However, the magnitude of change of the BESS on the landscape character is identified as being moderate due to its scale, removal of vegetation, and the lifecycle of the BESS. Moreover, an assessment of view impact to surrounding residences finds that the highest visual impact is 'moderate' at one residence and 'moderate-low' at three residences. The remaining viewpoints experience an impact assessed as 'low'.

To reduce impact on visibility, the noise attenuation wall colour will be tested for visual compatibility and contrast with affected viewpoints. Highly reflective materials and light colours will be avoided, and neutral colours with low-reflexivity and matte finishes will be used. Obtrusive signage will not be installed at the project entrance and the site will be kept neat and orderly during construction. Perimeter screen planting will reduce the visual impact on the development footprint, especially along northern and western boundaries. A detailed landscape plan provided at the construction stage will be considered and aim to align with community preferences.

The BESS will minimally impact on the existing night-time appearance of the area as the operation of the BESS does not necessitate major light-emitting activities. To avoid impacts on the night sky, the design and installation of lighting for the project will adhere to good lighting design principles, as outlined in the *Dark Sky Planning Guidelines*.

Noise and Vibration

The BESS will include noise-generating components such as the inverter, the battery unit, the DC Combiner, the Auxiliary Transformer, and the HV Transformer. As the operation of the BESS will continue throughout a 24-hour period, a conservation approach to assessing noise impact was undertaken. The noise modelling for the BESS facility without any mitigation measures shows that the predicted noise level exceeds the threshold for residential receivers identified as R2, R4, R5, R6, and R16 by up to 5dB. However, with suitable noise controls, including noise attenuation walls and nearfield HV transformer barriers, the acoustic impact of the BESS does not exceed the noise threshold for all receivers.

The anticipated acoustic impact of construction activities aligns with similar medium-sized infrastructure projects in a semi-rural setting. In terms of vibration impact, the project isn't anticipated to cause continuous vibration impacts that surpass the criteria in the *NSW RMS Construction Noise & Vibration Guideline*, given the 200m+ distance between the construction site and the nearest receivers. To reduce construction noise and vibration, it is

proposed to limit construction activities to standard working hours to minimise noise disturbances. Where certain activities necessitate work outside standard hours, all feasible noise-reducing measures are to be employed and, if the noise threshold exceeds 5 dB or more above the acceptable level, negotiations with the affected community must be undertaken.

Transport

The construction of the BESS is expected to generate around 67 vehicles (one-way) per day, comprising around 60 light vehicles and seven trucks, during the peak construction period. Additionally, four Oversize Overmass vehicles will attend site during construction. Calala Lane is considered acceptable to accommodate the anticipated traffic movements.

The operation of the BESS is not expected to result in any change to traffic conditions in and around the site and the proposal could not be expected to compromise the safety or function of the surrounding road network. Onsite parking is available for maintenance staff.

Bushfire

The site is situated in bushfire-prone land. The appropriate asset protection zones, access arrangements, and static water sources (two water tanks with a capacity of approximately 100,000) are provided to meet the requirements of *Planning for Bushfire Protection 2019*. Additionally, a bushfire emergency management and operations plan will be prepared for the BESS.

Water

The site flows into Calala Creek, which flows into the Calala Anabranch (approximately 5.8km downstream of the site), and which flows into the Peel River 2.2km further downstream. The primary impact of the BESS during construction and operation is stormwater runoff management. For construction, appropriate sediment and erosion controls measures are identified in the accompanying civil engineering concept plans. The operation of the BESS will manage the impacts of sediment, primarily generated by the unsealed gravel access roads. The basins installed during the construction phase will be cleaned and modified for operational use and are anticipated to effectively remove most of the sediment that would otherwise enter the waterways. The overflow from the basins will then enter a swale or level spreader which would further remove sedimentation before the runoff enters the waterways.

In the case of ruptured batteries, the contents of the batteries may be exposed to water runoff as a result of firefighting efforts. Should this occur, the contents of the battery (including heavy metals) are likely to leak out and be flushed out with the water used for firefighting, which would then enter the basin. If this situation were to occur, the removal of the contents of the basin would occur and would be treated as a contamination incident.

No effluent will be generated onside and as such no effluent management system is proposed. Water used for construction or operation will be trucked in. A culvert crossing is proposed to accommodate Calala Creek to the maximum probable flood level.

Hazards

The preliminary hazard analysis (**PHA**) concluded that “for all identified events the resulting consequences are not expected to have significant off-site impacts (serious injury and/or fatality to the public or off-site population)”. All hazards including electrical, arc flash, fire, chemical, explosive gas, reaction, EMF, and external factors are mitigated by inherent safety systems included in the BESS, employing mitigation measures, complying with relevant standards, and undertaking proactive maintenance. Additionally, the separation of the BESS from surrounding development mitigates the likelihood of offsite impacts.

Social Impact

The site is located in the NSW suburb of Calala, where most of the immediate impacts and benefits will be experienced. The nature and scale of the project will also result in impacts and benefits felt across the Tamworth Regional LGA, including those related to supply chains, transport networks, and employment opportunities. The key social impacts and benefits are identified below:

- Impact to local character. Mitigated, the impact will be low and negative.
- Distribution of impacts and benefits and its effect on community cohesion and resilience. Enhanced, the impact will be high and positive.
- Traffic impacts relating to congestion. Mitigated, the impact will be low and negative.
- Potential disruption to sites of Aboriginal significance. Mitigated, the impact will be low and negative.
- Health and safety in the event of a hazard. Mitigated, the impact will be low and negative.
- Benefit to the environment via reduced emissions. Enhanced, the impact will be high and positive.
- Amenity impacts relating to visual disruption. Mitigated, the impact will be low and negative.
- Provision of jobs and economic opportunities. Enhanced, the impact will be high and positive.
- Provision of a secure source of energy. Enhanced, the impact will be medium and positive.
- Perceived impact to property values. Mitigated, the impact will be low and negative.
- Strengthened connections with industry. Enhanced, the impact will be high and positive.
- Community unrest relating to transparency. Mitigated, the impact will be medium and negative.

The relevant mitigation measures for adverse impacts and enhancement opportunities for project benefits are discussed in detail in the accompanying social impact assessment.

Economic Impact

The BESS will result in an intensified economic outcome for the region, with the net increase in economic activity supported by 170 jobs during construction, a total net increase of 7 ongoing jobs as a result of the operation of the BESS, and the various multiplier effects and indirect economic stimulation as a result of the overall development.

Waste

Various types of standard construction waste will be generated during the construction of the project, such as concrete, excavated materials, green waste, metals, and general waste. Additionally, during the commissioning of the BESS, there is a potential that some of the batteries fail. In this case, batteries will be returned to the supplier and not directed to local waste facilities. During operation, waste will be avoided wherever possible. Where waste cannot be avoided, it will be removed by maintenance workers daily and sorted off-site for recyclable materials. No ongoing waste collection from the site by a waste contractor is required. Compliance with the waste management procedures for both construction and operation will consist of appropriate training, monitoring, and corrective actions to ensure that construction waste is appropriately disposed of.

Contamination

The preliminary site investigation (PSI found that the site has been used for agricultural purposes such as pasture grazing and cropping. As such, potential forms of contamination include pesticides and fertilisers. Laboratory

analysis results reported that concentrations of heavy metals were below the adopted assessment criteria and pesticides were below the limit of reporting. The maximum concentration of chemicals of potential concern at all sample locations were less than the adopted commercial use assessment criteria. The results from the soil sampling also fall below the more conservative residential HIL-A and Residential EIL assessment criteria. However, the PSI found that the investigation area is considered suitable for the proposed commercial land use from a chemical perspective.

Conclusion

The proposal has been designed to avoid environmental impacts where possible. The proposal provides for a development that is compatible with the emerging character of the locality and broader region noting the proximity of the site to the New England Renewable Energy Zone. The proposal will contribute to the strategic vision of investment in renewable energy projects with a view to reach emission targets identified in the various policies and strategic documentation discussed further in the EIS. The proposed development results in a development that provides a significant economic investment in renewable energy and importantly, the Tamworth region. The potential impacts arising from the development have been adequately considered through the various technical reports submitted and discussed with this EIS and any potential impacts can be mitigated through implementation of the recommended mitigation measures.

The EIS fulfils the requirements of the EPA Act and EP&A Regulation, addresses all relevant matters for consideration prescribed by the SEARs and demonstrates that the potential impacts of the proposal can be satisfactorily managed or mitigated. Given the evident benefits of the proposal and lack of significant environmental impacts, it is recommended that consent be granted to the application.

Acronyms

ACHA	Aboriginal Cultural Heritage Assessment
ADG Code	Australian Dangerous Goods Code
AHIMS	Aboriginal Heritage Information Management System
APZ	Asset Protection Zone
AWS	Automated Weather Stations
BAM	Biodiversity Assessment Method
BCD	Biodiversity and Conservation Division
BC Act	Biodiversity Conservation Act 2016
BDAR	Biodiversity Development Assessment Report
BESS	Battery Energy Storage System
BMS	Battery Management System
BoM	Bureau of Meteorology
BPM	Bushfire Protection Measures
BSAL	Biophysical Strategic Agricultural Land
CAA	Controlled Activity Approval
CBD	Central Business District
CEEC	Critically Endangered Ecological Community
CEMP	Construction Environmental Management Plan
dB(A)	Decibel
DECC	Department of Environment and Climate Change
DPE	Department of Planning and Environment
CIV	Capital Investment Value
DNG	Derived Native Grassland
ESD	Ecologically Sustainable Development
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
EPA Act	Environmental Planning and Assessment Act 1979

EPA Regulation	Environmental Planning and Assessment Regulation 2021
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
ESD	Ecologically Sustainable Development
ETMHC	Electricity Transmission Ministerial Holding Corporation
GDE	Groundwater Dependent Ecosystem
HAIS	Historical Archaeological Impact Statement
HAZID	Hazard Identification
HIPAP	Hazardous Industry Planning Advisory Papers
LCVIA	Landscape Character and Visual Impact Assessment
LGA	Local Government Area
LRET	Large scale renewable energy target
LSC	Land and Soil Capability
LSCA	Land and Soil Capability Assessment
LSPS	Tamworth Regional Council Local Strategic Planning Statement 2020
LUCRA	Land Use Conflict Risk Assessment
NEM	National Electricity Market
NVIA	Noise and Vibration Impact Assessment
PBP	Planning for Bushfire Protection 2019
PCT	Plant Community Type
POEO Act	Protection of the Environment Operations Act 1997
PHA	Preliminary Hazard Analysis
PSI	Preliminary Site Investigation
REZ	Renewable Energy Zone
RMUs	Ring Main Units
SCADA	Supervisory Control and Data Acquisition
SEARs	Secretaries Environmental Assessment Requirements
SEED	Central Recourse for Sharing and Enabling Environmental Data in NSW
SEPP	State Environmental Planning Policy
SEPP	State Environmental Planning Policy
SSD	State Significant Development
SSDA	State Significant Development Application
TEC	Threatened Ecological Community
TBDC	Threatened Biodiversity Data Collection
TfNSW	Transport for NSW
TIA	Transport Impact Assessment
TMP	Traffic Management Plan
TNSP	Transmission Network Service Provider
TRDCP	Tamworth Regional Development Control Plan
TRLEP	Tamworth Regional Local Environmental Plan 2010
WM Act	Water Management Act 2000
WMR	Water Management Plan

Table of Contents

Schedule of Figures & Tables

1 Introduction

This Environmental Impact Statement (**EIS**) has been prepared by Mecone Group NSW Pty Limited on behalf of Equis Energy (Australia) Projects (Ngumi 4) Pty Ltd (ABN: 80 353 224 865) as trustee for the Equis Energy (Australia) Ngumi 4 Asset Trust to support a State Significant Development Application (**SSDA**) to the Minister for Planning (*the Minister*) for a standalone battery energy storage system (**BESS**) with storage capacity up to 300MW and 1200MWh discharge capacity, and connection to Tamworth substation via underground transmission cable, and ancillary works (**the project**). The primary project address is 57 Burgess Lane, also known as 474 Calala Lane, Calala (Lot 17 DP629969), but the development also includes works on portions of Lot 16 DP629969, Lot 3 DP244399, Lot 4 DP244399, and Lot 6 DP219993 (**the site**).

The project is characterised as State Significant Development as the proposal is for the purpose of electricity generating works with a capital investment value in excess of $30 million, pursuant to Section 20 of Schedule 1 of *State Environmental Planning Policy (Planning Systems) 2021*. This SSDA is made under Part 4, Division 4.7 of the Environmental Planning and Assessment Act 1979 (**EPA Act**), and this EIS has been prepared in accordance with Part 8, Division 5 of the *Environmental Planning and Assessment Regulation 2021* (**EPA Regulation**).

This EIS addresses the requirements provided in the Secretary's Environmental Assessment Requirements (**SEARs** SSD-52786213) issued on the 30th of January 2023 by the NSW Department of Planning and Environment (**the Department**) and contains the required information under section 192 of the EPA Regulation including:

- a summary of the environmental impact statement;
- a statement of the objectives of the development, activity, or infrastructure;
- an analysis of feasible alternatives to the carrying out of the development;
- a description of the development and the surrounding environment likely to be affected;
- the likely environmental impacts;
- the proposed mitigation measures;
- a list of approvals that must be obtained under another Act or law; and
- the reasons justifying the varying out of the development.

Furthermore, this EIS has been prepared with regard to the following guidance documentation prepared by the Department:

- *State Significant Development Guidelines;*
- *Cumulative Impact Assessment Guidelines for State Significant Projects*;
- *Undertaking Engagement Guidelines for State Significant Projects*
- *Social Impact Assessment Guideline for State Significant Projects*

On balance, it is considered that this application will contribute to the security and reliability on the National Electricity Market, support NSW's shift to renewables in accordance with the *NSW Electricity Strategy*, support the local economy through social and economic benefits, and result in no unacceptable or unmanageable impacts. As such, it is requested that the Minister exercise the authority to approve the project subject to appropriate conditions of consent.

1.1 The applicant

The applicant is Equis Energy (Australia) Projects (Ngumi 4) Pty Ltd (ABN: 80 353 224 865) as trustee for the Equis Energy (Australia) Ngumi 4 Asset Trust (Equis), whose registered address is at Ground Floor, 36 Esplanade, Brighton, Melbourne, VIC 3186.

Equis is one of Asia Pacific's leading infrastructure developers and is actively pursuing renewables development and investment across the Asia-Pacific region. To date, Equis has successfully developed over 11GW of renewable energy and over 220 renewable energy projects around the world. Equis has Australian offices in Victoria and Queensland, and is actively pursuing a range of battery and renewable energy projects across Victoria, Queensland, South Australia, New South Wales and Tasmania. Equis has extensive experience developing renewable energy assets across the country, more information about Equis is available at Equis Australia's webpage at https://www.equis.com.au/.

1.2 Description of the project

1.2.1 Overview

The proposed development involves construction of a standalone battery energy storage system (**BESS**) with storage capacity up to 300MW and 1200MWh discharge capacity, and connection to Tamworth substation via underground transmission cable, plus ancillary works (**the project**).

The proposed development is characterised as state significant development as the proposal is for the purpose of electricity generating works with a capital investment value exceeding $30 million, pursuant to Section 20 of Schedule 1 of *State Environmental Planning Policy (Planning Systems) 2021*.

1.2.2 Project objectives

The Project objectives are to:

- facilitate NSW's shift towards renewable energy in accordance with the *NSW Electricity Infrastructure Roadmap* and the *NSW Electricity Strategy*;
- support the energy storage and firming requirements of the national electricity market in accordance with the *Australian Energy Market Operator (AEMO) 2022 Integrated System Plan for the National Electricity Market*;
- enhance the stability and resilience of the electricity network by providing energy storage, thereby ensuring consistent back-up power supply during electricity outages;
- provide for a development that is suitable to the rural context and has no significant or unmanageable adverse environmental impacts; and
- support the locality through social and economic enhancement through the Project's construction and operational life.

1.2.3 Site information

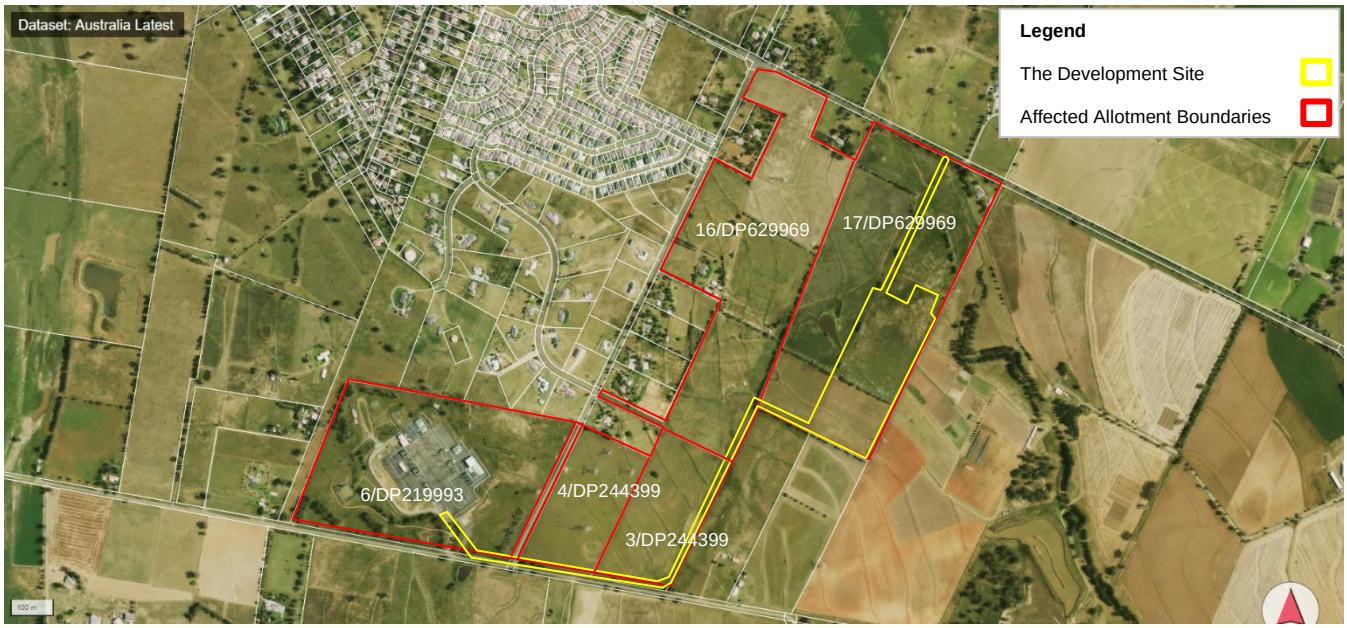


FIGURE 1 – SUBJECT SITE

Source: MetroMap (dated 29/11/2022)

The BESS site occupies a portion of Lot 17 DP629969 and is known as 57 Burgess Lane, Calala (alternatively known as 474 Calala Lane, Calala). However, the development site also comprises portions of an additional four allotments for the construction of the transmission cable including:

- 57 Burgess Lane, Calala (Lot 16 DP629969)
- Burgmanns Lane, Calala (Lot 3 DP244399)
- Burgess Lane, Calala (Lot 4 DP244399)
- 707 Burgmanns Lane, Calala (Lot 6 DP219993)

The BESS site is approximately 36.24ha in area and has a frontage of approximately 420m to Calala Lane. The surrounding development to the north, east, and south consists largely of agricultural uses and primary production, as well as residential dwellings situated on large allotments. Approximately 1.2km to the east is Farrer Memorial Agricultural High School and 1.5km to the southeast is the NSW Department of Primary Industries. The proposed BESS is located approximately 1.7km west of Calala town centre consisting largely of residential subdivisions with lots between 500m^2 and 1,000m^2, with some residential allotments approaching approximately 1ha in size. The Calala town centre includes commercial uses such as a grocery store, restaurants, retail shops, and other various businesses. It is also situated approximately 6km south-east of Tamworth. Tamworth is one of the 2 main centres of the New England North West Region of NSW (the other being Armidale), providing a range of jobs, housing and services for the region's population.

The footprint of the proposed BESS occupies approximately 8.9ha (or approximately 24% of the total area of Lot 17 DP629969). The Transgrid Tamworth 330kV Substation is located just over 1km to the southwest of the BESS site. The proposed transmission line runs along the southern boundary of Lots 16 and 17 in DP629969, the eastern and southern boundary of Lot 3 in DP244399, the southern boundary of Lot 4 in DP244399, and the southeastern portion of Lot 6 in DP219993 to the Transgrid Tamworth 330kV Substation. The site's location in the regional context is shown in Figure 2

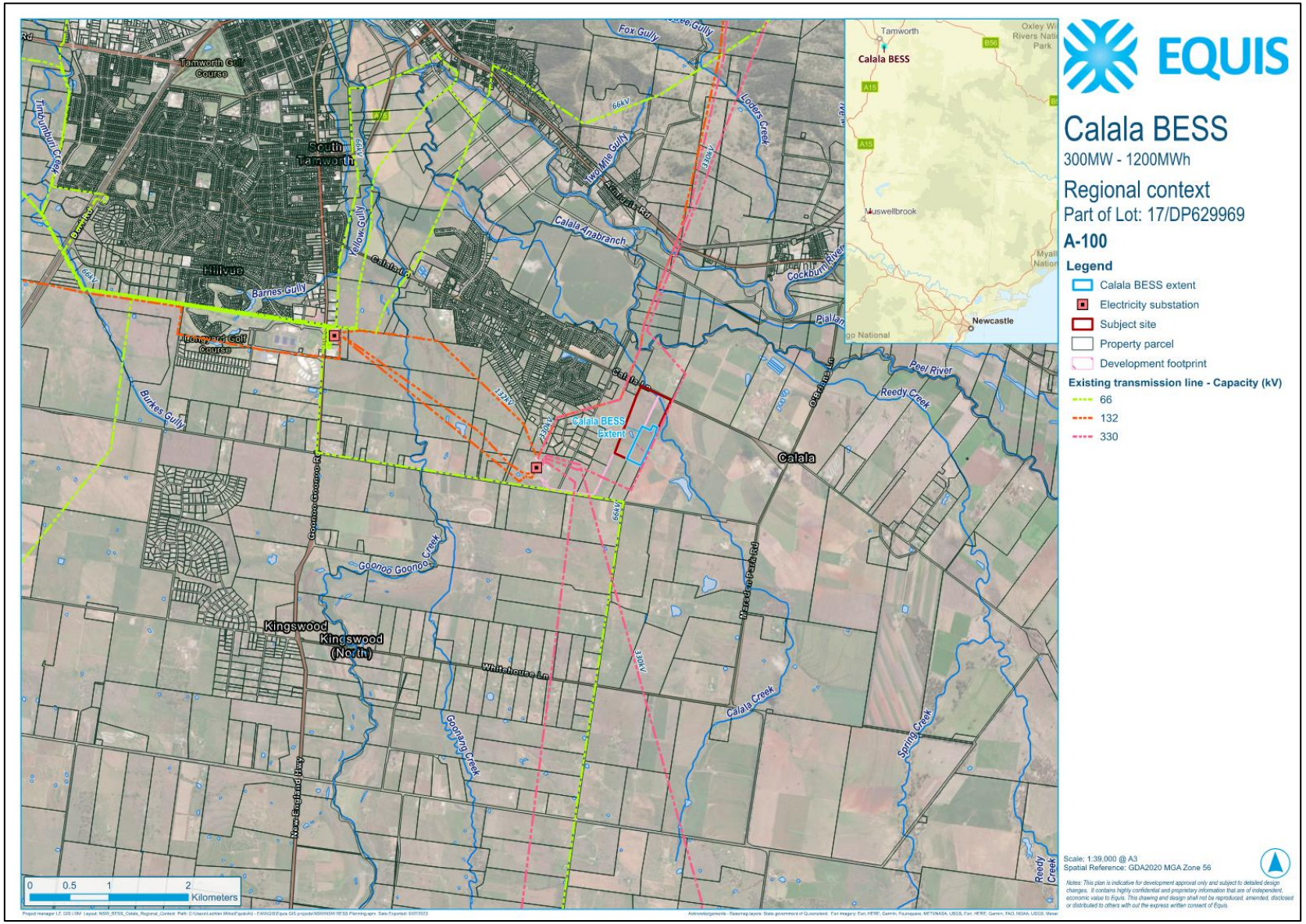


FIGURE 2 – REGIONAL CONTEXT MAP

Source: Equis

1.3 Background to the project

The Project was initiated after a comprehensive assessment of electrical supply and demand across NSW, which included a review of *AEMO's 2022 Integrated System Plan* (**AEMO 2022 ISP**) and future demand expectations.

Once a suitable substation had been identified (i.e., Tamworth 330kV Substation), the applicant carried out a constraints and opportunities assessment for all land within 2km of the substation. This included a review of flora and fauna constraints, existing land use and zoning, distance from dwellings, land availability, transmission line availability, and flooding. This assessment also included a review of the strategic planning objectives of Tamworth and Calala to ensure the site was not identified as being needed for future urban growth.

Once a suitable site located near to the substation was identified, the applicant engaged specialist consultants to design the facility and carry out detailed assessments of environmental, economic and social impacts. This process has led to the Project as presented in this EIS.

The following key strategies have been adopted to avoid, minimise or offset the impacts of the Project:

- locate the facility away from sensitive receivers;
- provide suitable acoustic screening around the facility;
- provide suitable landscape screening around the facility;
- provide suitable Asset Protection Zones around the facility; and
- implement appropriate management measures during construction and operation.

These strategies are discussed in further detail throughout Section 7 of this EIS.

1.4 Related development

There is no related development that will be incorporated into the Project under a separate assessment process.

1.5 Restrictions or covenants that apply to the site

An easement for an aboveground transmission line runs along the eastern boundary of the site. The proposed BESS footprint and access road are outside of this easement.

The proposed underground transmission cable route running towards the Tamworth substation crosses multiple easements for aboveground transmission lines.

2 Strategic context

2.1 Justification of project

The Project aligns with the shifting energy context of NSW. As the state transitions away from coal fired power to cheaper and cleaner weather-dependent renewable energy sources such as solar and wind power, there is an increasing need for battery storage to firm (make reliable and consistent) these weather-dependent renewable sources so that energy supply can respond to consumer demand. The following sections demonstrate how the project aligns with the relevant state policies and strategies relevant to electricity infrastructure.

2.1.1 NSW Electricity Infrastructure Roadmap

The *NSW Electricity Infrastructure Roadmap* (**the Roadmap**) prepared by the Department in 2020 provides a framework to deliver an electricity system with improved generation, transmission and storage capabilities in NSW based on five foundational pillars, discussed below.

Pillar 1: Driving Investment in Regional NSW

The project is a direct investment exceeding $30 million into the New England North West Region, providing up to 170 employment opportunities during construction and seven jobs during the operation of the BESS. Moreover, the BESS has been designed to ensure compatibility and complementarity with the existing rural context, which is addressed in detail in Appendix N. Therefore, the project aligns with Pillar 1.

Pillar 2: Delivering Energy Storage Infrastructure

Renewable energy generation is subject to environmental factors like the sun and wind, making it volatile in nature. Hence, long-term electricity storage is necessary to ensure that electricity is readily available when required, thereby firming the electricity system. The BESS facilitates the storage of excess energy to be released when required, thereby firming the electricity system and increasing its reliability. Therefore, the project aligns with Pillar 2.

Pillar 3: Delivering Renewable Energy Zones

The Project is located near the New England Renewable Energy Zone (**REZ**), an area established by the NSW Government as a hub for wind and solar power generation. Although outside of the boundaries of the REZ, the Project is near major transmission lines that will connect the REZ to the NSW electricity grid. Therefore, the project aligns with Pillar 3.

Pillar 4: Keeping the Grid Secure and Reliable

As previously discussed in response to Pillar 2, the BESS will contribute to firming the electricity system. The Roadmap refers to the 2022 AEMO's Integrated System Plan, which indicates that NSW will require approximately 2.3GW of energy storage capacity to increase the electricity system's reliability and security. The project will improve the electricity system's ability to meet electricity demand and facilitate NSW's increased reliance on renewable energy generation providing storage capacity of up to 300MW. Therefore, the project aligns with Pillar 4.

Pillar 5: Harnessing Opportunities for Industry

The Roadmap states, in relation to Pillar 5, that *"As we head towards a low carbon future, access to cheap, clean and reliable energy will create a competitive advantage for NSW. This will attract businesses and enable new industries to emerge and grow, underwriting our prosperity and setting us up for generations."* The BESS increases the viability of low-carbon renewable energy generation by firming the electricity network. Therefore, the project aligns with Pillar 5.

The BESS project distinctly aligns with and contributes to the achievement of all five pillars of the Roadmap. By bolstering regional investment, energy storage, grid reliability, renewable energy zones, and opportunities for industry, it paves the way for NSW's low-carbon future. This project contributes to the Roadmap's holistic approach to electricity infrastructure development and reinforces NSW as a leader in renewable energy innovation and sustainable development.

2.1.2 NSW Electricity Strategy

The NSW Electricity Strategy is underpinned by four principles:

- **Principle 1**: New generation, delivered by competitive markets, should reduce electricity prices and protect the environment
- **Principle 2**: Governments remain ultimately accountable for electricity reliability
- **Principle 3**: Government action should limit costs to taxpayers and consumers
- **Principle 4**: Government action should be consistent with NSW's other policy objectives, including its commitment to the National Electricity Market (**NEM**)

While the project is aligned with, or does not hinder the attainment of, all four principles, Principle 1 is particularly relevant and is discussed in greater detail below.

Principle 1: New generation, delivered by competitive markets, should reduce electricity prices and protect the environment

"Renewables, firmed by dispatchable technologies such as gas and storage, are the lowest cost form of new reliable electricity generation. Accordingly, a good investment environment will deliver new generation, reduce electricity prices and ensure reliability while protecting the environment."

The NSW Electricity Strategy notes that all coal fired power plants in NSW are scheduled for closure within the next 20 years. In fact, the Liddell Coal Fired Power Plant was closed in April of this year, and Origin announced the accelerated closure of its Eraring Coal Fired Power by 2025, seven years ahead of its anticipated closure date. The strategy states that firmed renewables are the lowest cost option to replace aging coal power stations. As such, the 'traditional linear energy system' is being replaced by the 'modern complex energy system', whereby renewable electricity generation is firmed by energy storage as shown in Figure 3. Because the BESS provides the ability for firming of the electricity network, the project aligns with Principle 1.

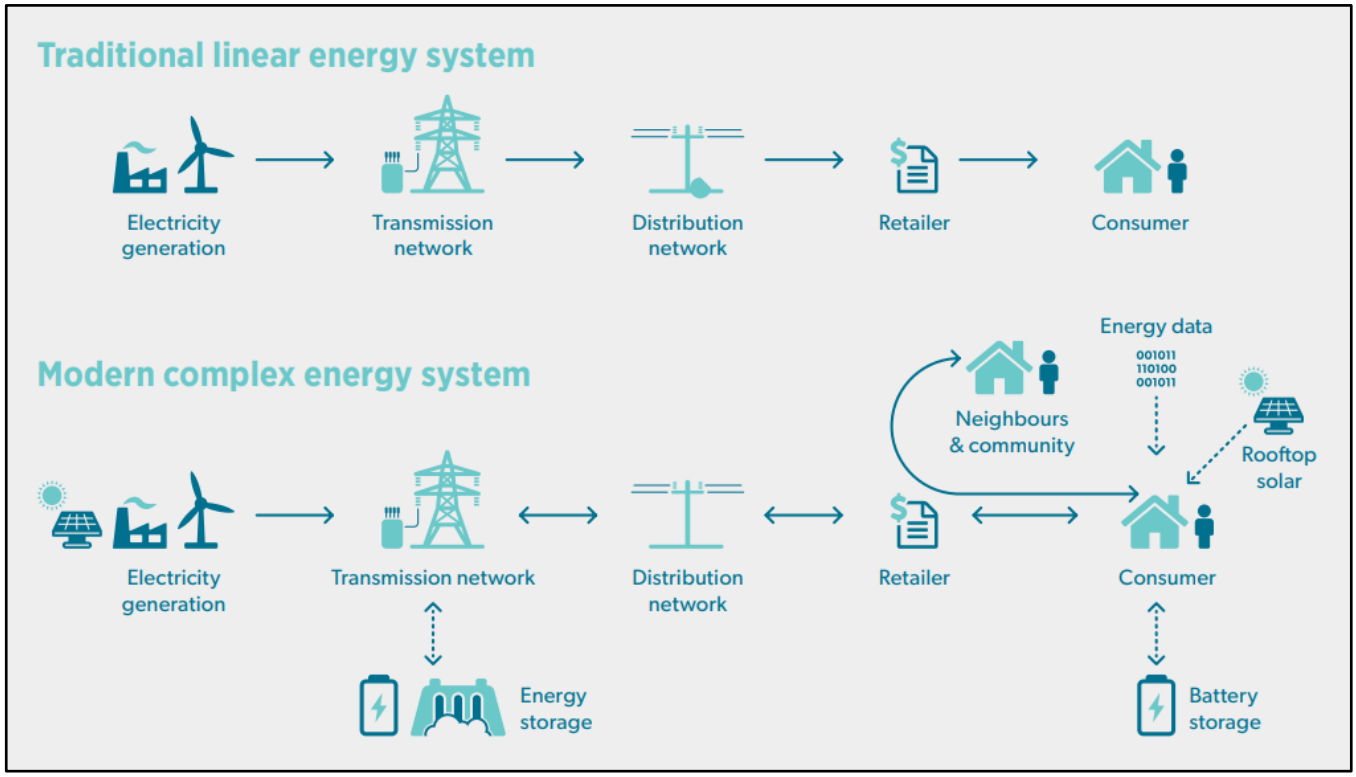


FIGURE 3 – TRADITIONAL AND LINEAR ENERGY SYSTEMS

Source: NSW Electricity Strategy

2.1.3 AEMO 2022 Integrated System Plan for the National Electricity Market

The *Australian Energy Market Operator 2022 Integrated System Plan for the National Electricity Market* (**AEMO 2022 ISP**) emphasises that BESS facilities, such as this project, are required to provide firming capacity to aid in the variability in supply of renewable energy and to support the supply of electricity during peak energy demands. The AEMO 2022 ISP found that the national electricity market needs to triple its electricity generation and storage capacity, and that 46 GW/640 GWh of dispatchable storage capacity is required by 2050 to efficiently operate and firm variable renewable energy. The project is classified by the AEMO 2022 ISP as 'medium storage' because it has energy storage capacity between four and twelve hours, which is useful for supporting daily variation in solar and wind output. As such, the project will support the storage and firming requirements of the national electricity market as identified in the AEMO 2022 ISP.

2.1.4 Other relevant plans and policies

Table 1 provides comment on other relevant plans and policies.

TABLE 1 – OTHER PLANS AND POLICIES

PLAN/POLICY	COMMENT
International policy	
Paris climate agreement	The proposed development will contribute to Australia's target of reducing emissions by 26-28% below 2005 levels by 2030, through the

PLAN/POLICY	COMMENT
	generation of electricity from renewables. A key benefit of the Calala BESS is its positive impact on reducing greenhouse gas emissions and moving electricity generation towards cleaner electricity generation.
Commonwealth policy	
Climate Change Act 2022	The BESS will assist in achieving emissions reduction target of 43 percent from 2005 levels by 2030, and net zero emissions by 2050 by introducing up to 300 MW / 1200 MWh energy storage into the NEM.
Large scale renewable energy target (LRET)	The LRET incentivises investment in renewable energy projects. The LRET of 33,000 GW hours of additional renewable electricity generation was met at the end of January 2021 (Clean Energy Regulator, 2021). The annual target will remain at 33,000 GWh until the scheme ends in 2030, notwithstanding that the Clean Energy Regulator expected that large-scale renewable generation could reach up to 40,000 GWh in 2021. Consistent with the intent of the LRET, the project will support renewable energy generators through providing firming storage and allowing for energy dispatch during periods where intermittent generators are not generating energy.
Australia's Long-Term Emissions Reduction Plan	This plan aims to reach a net zero economy through a technology-based approach, while protecting relevant industries, regions and jobs. It identifies that storage technologies, such as batteries, are critical for enabling high shares of renewables and ensuring energy security and reliability. Consistent with this plan, the Project will support the management of daily variations in solar and wind generation and will contribute to short-term firming to the grid.
NSW State policy	
NSW Climate Change Policy Framework	The NSW Climate Change Policy Framework guides the NSW Government's policy and programs, including the NSW Climate Change Fund and the NSW Electricity Infrastructure Roadmap. This Project aids in meeting the net-zero emissions by the 2050 target as discussed below.
Net Zero Plan Stage 1: 2020-2030	This plan sets out how the NSW Government will deliver upon an objective to achieve net zero emissions by 2050 and identifies an objective to deliver a 50% cut in emissions by 2030 compared to 2005 levels. The Project will support renewable energy generators through providing firming storage and allow for energy dispatch during periods where intermittent generators are not generating energy.

2.2 Land Use

2.2.1 New England North West Regional Plan

The New England North West Regional Plan 2041 is the NSW Government's strategy for guiding land-use planning decisions for the New England North West for the next 20-years.

The Regional Plan sets out 22 objectives under the following 5 Parts:

- **Part 1**: Growth, change and opportunity
- **Part 2**: Productive and innovative
- **Part 3**: Sustainable and resilient
- **Part 4**: Housing and place
- **Part 5**: Connected and accessible

The objectives contained within the 5 Parts are set out in Table 2 below.

TABLE 2 – OBJECTIVES OF THE NEW ENGLAND NORT WEST REGIONAL PLAN

PART	OBJECTIVE	RESPONSE
Part 1: Growth, change and opportunity	Objective 1: Coordinate land use planning for future growth, community need and regional economic development	The project aligns with this objective by identifying a suitable location for the BESS given its context (refer to Appendices H & I for further discussion). The project will also result in direct investment into the region and result in new employment opportunities as identified in Appendix U. The project will create 170 employment opportunities during construction and seven during the operational lifespan of the BESS.
Part 2: Productive and innovative	Objective 2: Protect the viability and integrity of rural land	An agricultural land capability study was undertaken (refer to Appendix M) and finds that land is not suitable for full time agriculture and its use for a Battery Energy Storage System will not have a detrimental impact on the agricultural capability of the land. Moreover, the decommissioning of the project at the end of its lifecycle would allow the land to be re-used for rural purposes.
Part 3: Sustainable and resilient	Objective 8: Adapt to climate change and natural hazards and increase climate resilience	The project facilitates the implementation of renewable energy generation, thereby increasing climate resilience of the Tamworth LGA.
	Objective 9: Lead renewable energy technology and investment	Investing in energy storage infrastructure is crucial for effectively implementing renewable energy. This project is a direct investment oriented towards achieving this objective.
	Objective 10: Support a circular economy	NSW's transition towards a circular economy is underlined by certain key principles including: • Sustainable management of all resources

		• Design out waste and pollution • Innovate new solutions for resource efficiency • Create new circular economy jobs The BESS project is innovative as it is relies on new technology, and it contributes to the sustainable and efficient management of resources by storing excess energy to be used as required. The BESS does not produce carbon emissions and facilitates the transition away from energy sources that emit significant pollution. Moreover, the BESS facility will provide employment opportunities for residents in the locality.
	Objective 11: Sustainably manage and conserve water resources	The Water Management Report in Appendix Q concludes that the proposed development incorporates appropriate mitigation measures to prevent harm to water resources in the Peel River Valley.
	Objective 12: Protect regional biodiversity and areas of High Environmental Value	The accompanying Biodiversity Assessment Report in Appendix H demonstrates that the proposed development avoids and minimises impacts to biodiversity by minimising distances to the Tamworth substation and by avoiding impacts to vegetation and riparian lands where possible. Appropriate mitigation measures will be implemented to address potential biodiversity impacts, and where avoidance and mitigation is not feasible, the impacts will be offset under the Biodiversity Offset Scheme.
Part 4: Housing and place	Objective 13: Understand, respect and integrate Aboriginal culture and heritage	An Aboriginal cultural heritage assessment contained in Appendix I identified that the study area does not contain any known aboriginal sites or objects and that there is “no archaeological significance within the study area”.
	Objective 17: Celebrate local character	The Landscape Character and Visual Impact Assessment contained in Appendix N demonstrates that the impact of the development on the landscape character of the area has been considered by selecting a site with low-lying land, not significantly changing the landform, and through the selection of the muted grey colouring of most project components. As such, the local character of the area is reasonably accommodated by the development.
Part 5: Connected and accessible	Objective 19: Leverage new and upgraded infrastructure	The project proposes key electricity infrastructure required for NSW’s transition to renewable energy in accordance with the NSW Electricity Strategy.

In addition to the objectives for the region, the Regional Plan also identifies priorities for the Tamworth LGA. One of the priorities is to "support appropriately located wind, solar and other renewable energy production opportunities, as well as battery storage facilities." The project will directly contribute to this priority, as it proposes the implementation of an appropriately sited BESS within the Tamworth LGA. Therefore, this project serves not only the regional objectives but also the specific priorities of the Tamworth LGA.

2.2.2 Tamworth Regional Local Strategic Planning Statement 2020

The Tamworth Regional Council Local Strategic Planning Statement 2020 (**LSPS**) is the core strategic planning document for Council for the next 20 years. The LSPS prioritises six themes for the local government area (**LGA**) and are set out in Table 3 below.

TABLE 3 – TAMWORTH REGIONAL LSPS THEMES

THEME	RESPONSE
Theme 1: *Facilitate Smart Growth and Housing Choices*	The LSPS identifies areas of preferred residential growth in the LGA. Regarding Calala, the LSPS identifies that the identified growth areas are already rezoned; that is, the LSPS identifies no new areas for residential expansion in Calala. This means the proposal does not affect Council's plans for residential growth in the area.
Theme 2: *Create a Prosperous Region*	The proposed is a major infrastructure investment in the region providing 170 construction employment opportunities and seven ongoing operational employment opportunities, contributing to the region's economic prosperity.
Theme 3: *Build Resilient Communities*	The proposed BESS will increase the stability and security of the electricity network, thereby increasing the resilience of the Tamworth LGA.
Theme 4: *Connect Our Region and Its Citizens*	The proposed BESS does not adversely impact this theme.
Theme 5: *Design with Nature*	The project integrates with the existing rural landscape character of the area through appropriate site selection, colour palette choice, and landscaping. Refer to Appendix N for further detail.
Theme 6: *Celebrate our Culture and Heritage*	The project does not adversely impact the cultural or heritage values of the area. An Aboriginal cultural heritage assessment contained in Appendix I identified that the study area does not contain any known aboriginal sites or objects and that there is "no archaeological significance within the study area".
Theme 7: *Deliver Durable Infrastructure*	The proposed BESS represents a major infrastructure upgrade for the Tamworth LGA that will increase the region's electricity security and reliability.

2.3 Key features of the site and surrounds

2.3.1 Location

The BESS site located at 57 Burgess Lane, Calala, NSW, and is formally known as Lot 17 DP629969. It is approximately 1.7km west of Calala and 6km south-east of Tamworth. The footprint of the proposed BESS is in the south-eastern portion of the site, occupying approximately 8.9ha (or 24% of the site). A concept plan identifying the site and BESS footprint is provided at Figure 4. The site is roughly rectangular in shape, is approximately 36.24ha in area and has a frontage of approximately 500m to Calala Lane.

It is noted that despite having frontage to Calala Lane, the site's official address as per NSW government mapping is 57 Burgess Lane. This is because the site forms part of a larger landholding comprising 3 lots, 2 of which have frontage to Burgess Lane (Lot 16 DP629969 and Lot 3 DP524962). The BESS site is also known as 474 Calala Lane, Calala, for postage and local identification purposes.

The proposed transmission cable crosses Lot 16 DP629969, Lot 3 DP244399, Lot 4 DP244399, and Lot 6 DP219993. ETMHC owns Lot 3 DP244399, Lot 4 DP244399, and Lot 6 DP219993 and are used for above-ground electricity transmission. Lot 16 DP629969 is used for agricultural and residential purposes, and contains a dwelling and a dam.

TABLE 4 – BESS SITE DESCRIPTION SUMMARY

ITEM	DESCRIPTION
Current and historical use	The site is currently used for horse grazing and consists of mostly cleared rural land. The site has historically been used for agricultural and grazing purposes. A registered water bore (GW064001) is located near the existing dwelling. A single dwelling is currently located in the north-eastern corner of the site. The dwelling is vacant and is not used for residential purposes at the current time. The BESS site and the associated dwelling have been acquired by the applicant and since acquiring the site, the dwelling has been vacated.
Zoning	The site is situated in zone RU4 Primary Production Small Lots and is immediately surrounded by land in the RU4 zone. Land along the proposed transmission cable and existing Tamworth substation are also within the RU4 zone. A zoning map is provided at Figure 5.
Topography	The land is relatively flat, with the highest elevation of approximately 412m occurring in the southern portion of the site.
Vegetation	The site is agricultural land cleared of remnant vegetation and covered by grassland and land cultivated for agricultural purposes. The only notable vegetation is shrubs and trees planted for stock shade and demarcation purposes, plus landscaping around the existing dwelling.
Hazards and constraints	The site is identified as Category 3 bushfire prone land (refer to Figure 6). There is a riparian corridor running through the northern portion of the site, well outside of BESS footprint (refer to Figure 7). Two dams are located on the site, both in the southwest quadrant of the site.

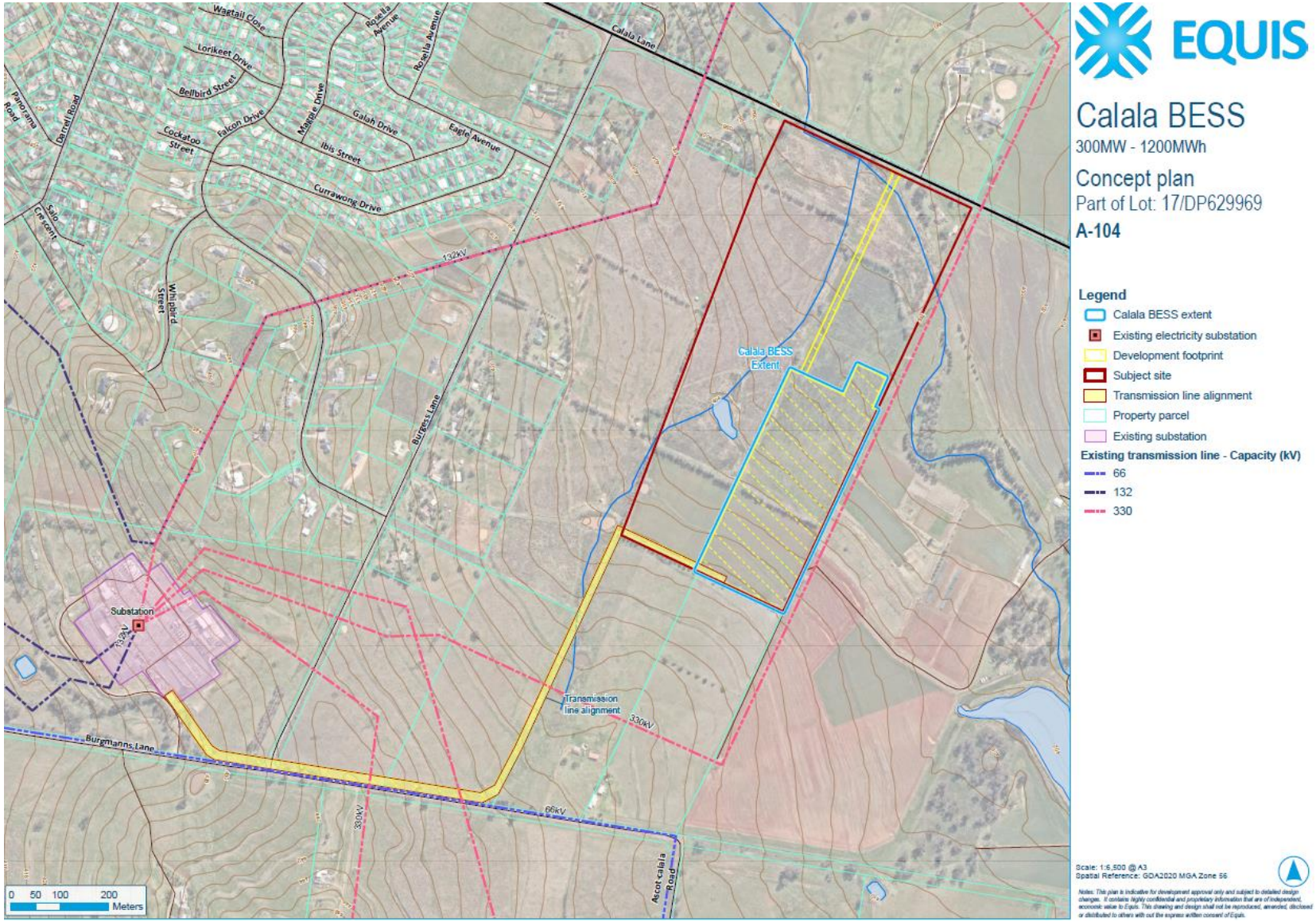


FIGURE 4 – CONCEPT PLAN

Source: Equis

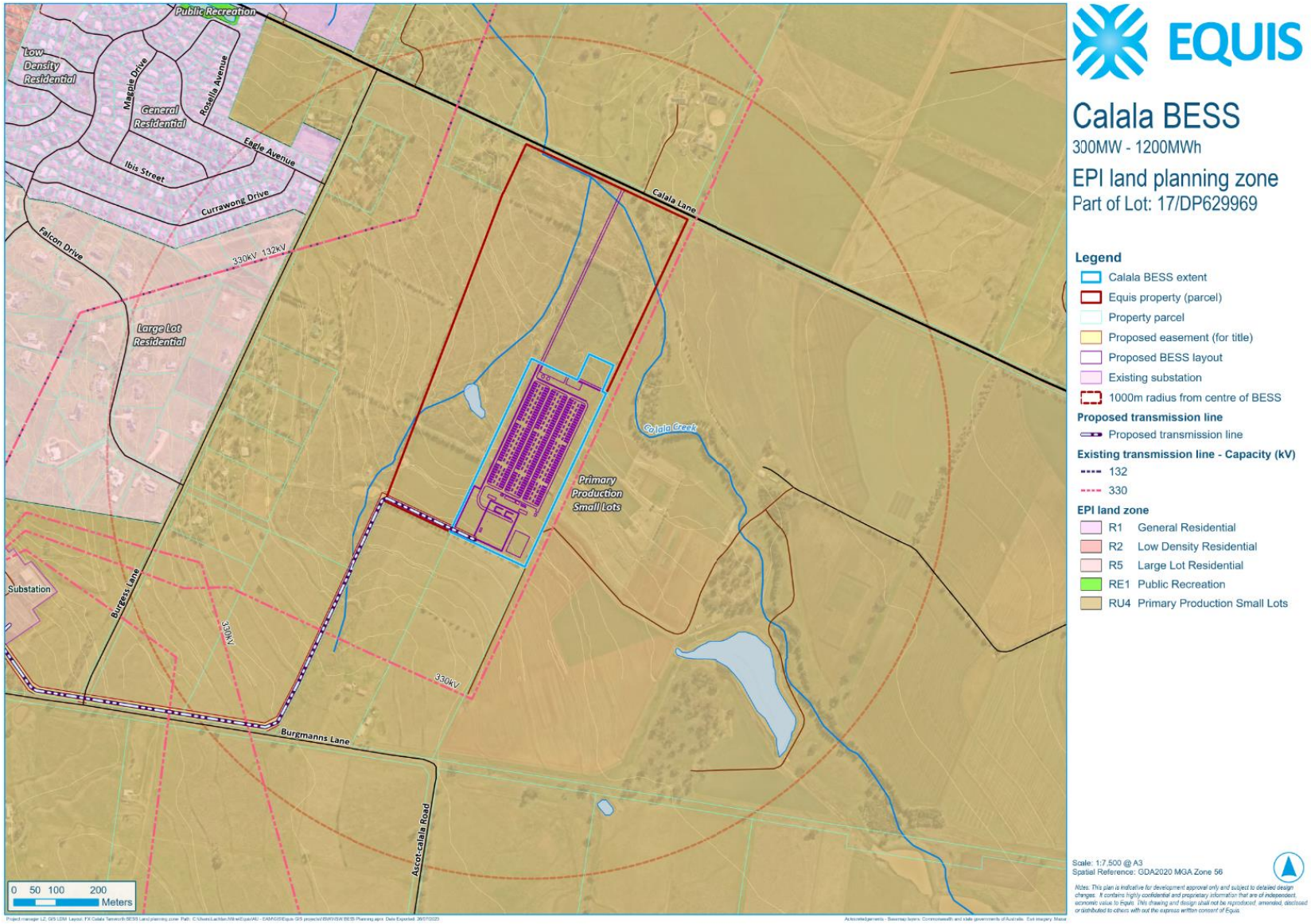


FIGURE 5 – ZONING MAP

Source: Equis

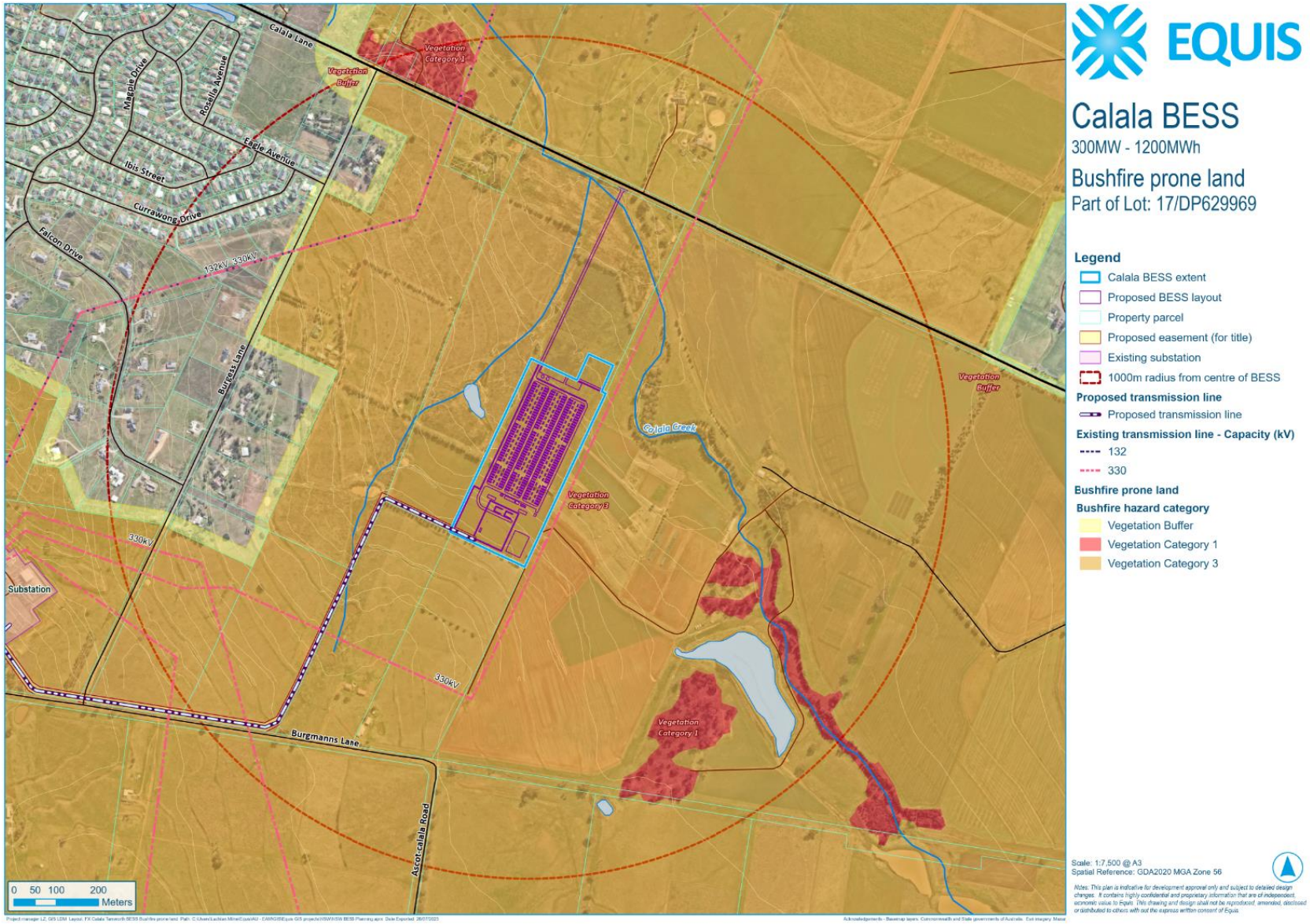


FIGURE 6 – BUSHFIRE PRONE LAND MAP

Source: Equis

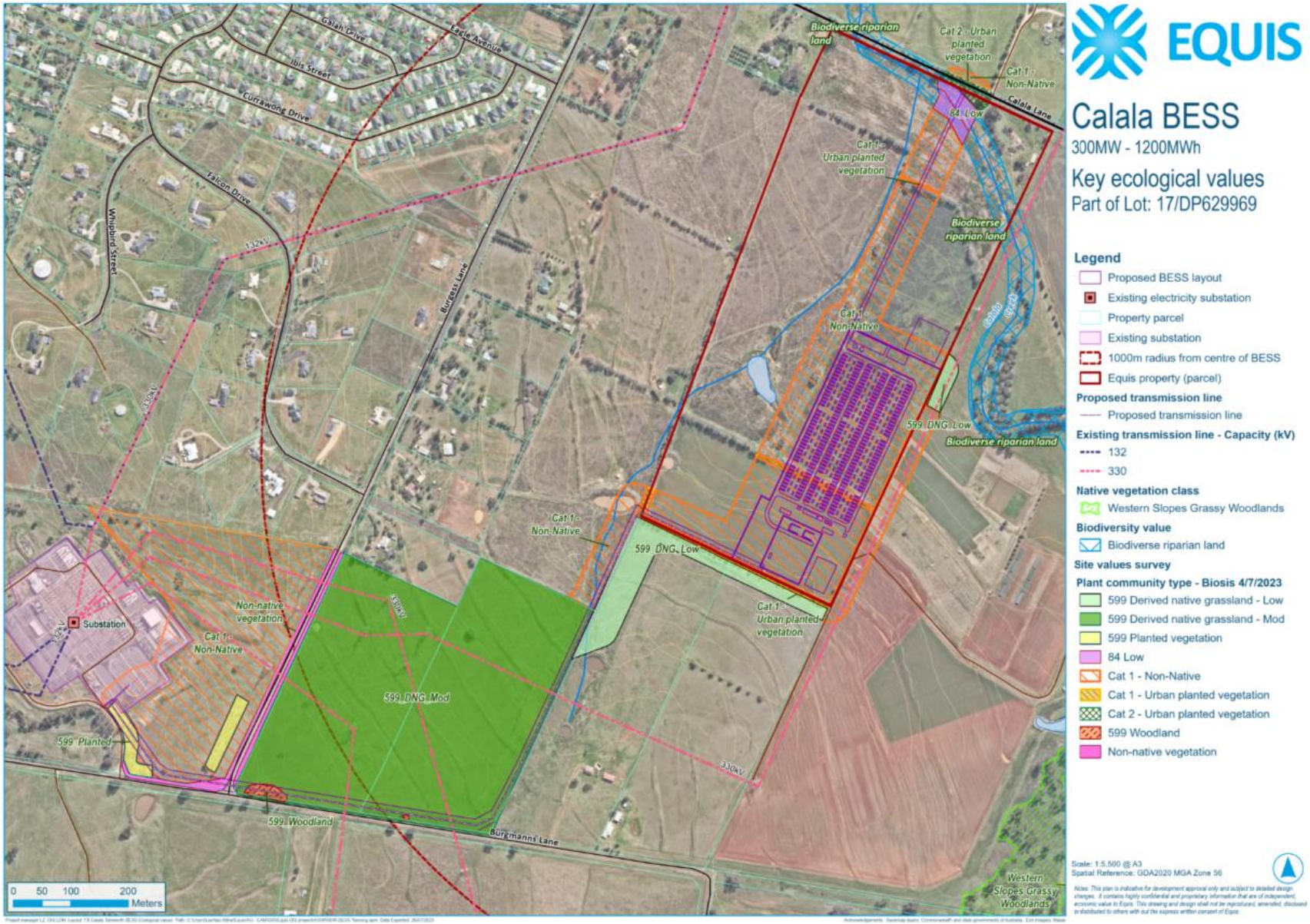


FIGURE 7 – ECOLOGICAL VALUES MAP

Source: Equis

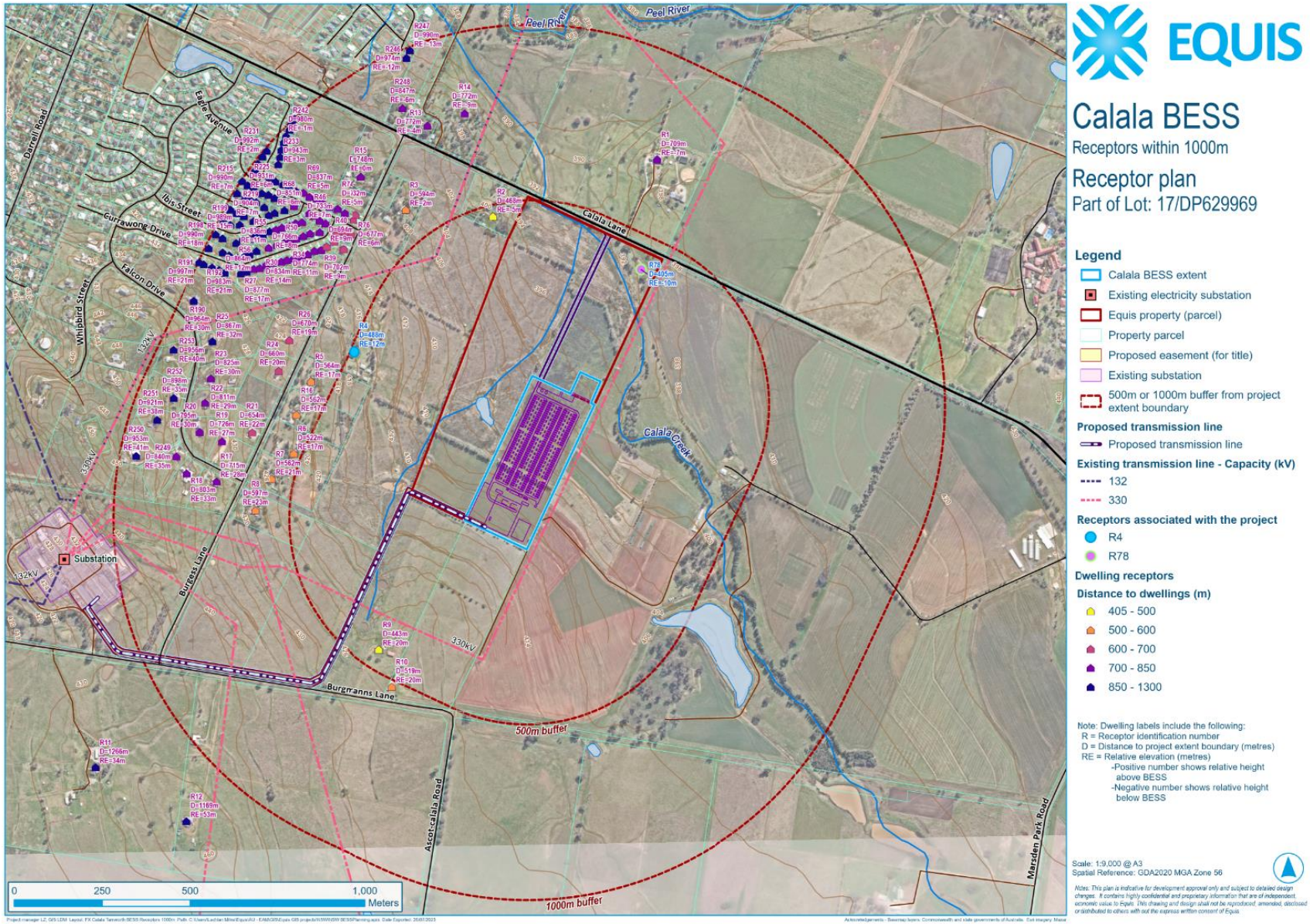


FIGURE 8 – SURROUNDING DWELLINGS

Source: Equis

Table 5 below provides a summary of the receiver numbers, addresses and distances located within 700m of the project.

TABLE 5 – SURROUNDING DWELLINGS SUMMARY

RECEIVER ID	PROPERTY ADDRESS	DISTANCE FROM BESS TO RECEPTOR (m)*
R1	473 CALALA LANE CALALA	709
R2	438 CALALA LANE CALALA	468
R3	23 BURGESS LANE CALALA	594
R4 (Associated with the project)	57 BURGESS LANE CALALA	488
R5	69 BURGESS LANE CALALA	564
R6	93 BURGESS LANE CALALA	522
R7	99 BURGESS LANE CALALA	562
R8	111 BURGESS LANE CALALA	597
R9	781 BURGMANNS LANE CALALA	443
R10	795 BURGMANNS LANE CALALA	519
R16	87 BURGESS LANE CALALA	562
R21	94 BURGESS LANE CALALA	654
R24	68 BURGESS LANE CALALA	660
R26	62 BURGESS LANE CALALA	670
R40	66 CURRAWONG DRIVE CALALA	694
R41	68 CURRAWONG DRIVE CALALA	683
R42	70 CURRAWONG DRIVE CALALA	692
R43	48 EAGLE AVENUE CALALA	676
R45	36 BURGESS LANE CALALA	649
R76	43 EAGLE AVENUE CALALA	677
R77	26 BURGESS LANE CALALA	681
R78 (Vacant dwelling associated with the project)	474 CALALA LANE CALALA	405

* The distances identified in Table 5 are based on the distance measured from the edge of the BESS extent to the dwelling receptor.

2.3.2 Surrounding development

Land immediately surrounding the site comprises rural land zoned RU4 Primary Production Small Lots. Further out, urban residential land (R5 Large Lot Residential and R1 General Residential) occurs to the west, north and south.

The nearest urban residential land is located approximately 280m to the west of the site boundary and approximately 480m west of the BESS footprint.

There are approximately 78 dwellings within 1km of the site. Refer to Figure 8.

Electrical infrastructure is a common feature in the landscape of the surrounding areas due to the nearby Tamworth 330kV substation. For example, four high voltage 330kV electrical transmission towers, measuring above 40m in height and spaced approximately 300-500m and one 132kV electrical transmission line easement runs within 1km of the site.

Other notable surrounding developments include:

- Farrer Memorial Agricultural High School, located approximately 800m to the east of the site along Calala Lane;
- Tamworth Agricultural institute, located approximately 1.5km to the east of the site; and
- Tamworth 330kV substation, located approximately 800m to the southwest.

2.4 Agreements with other parties

An agreement is in place between Equis and ETMHC for the lodgement of the subject application over land to which ETMHC is the controlling authority for. The land to which the agreement relates between the parties is:

- Lot 3 DP244399
- Lot 4 DP244399
- Lot 6 DP219993

Moreover, an agreement is in place between Equis and the owner of Lot 16 DP629969 for the lodgement of the subject application. Equis is the owner of Lot 17 DP629969. As such, owners' consent for all properties accompanies this application.

2.5 Cumulative impacts

There is a proposal for a 200MW BESS facility (SSD-23830229), located approximately 700m to the south of the site, at 696 Burgmanns Lane, Kingswood. The SEARs have been issued for the project on 1 September 2021, however an EIS has not been lodged with the Department since this time.

Kingswood BESS is a proposed 500MW / 1,000MWh battery storage facility located south of the subject site at 744 Burgmanns Lane, Kingswood NSW 2340. The proposal is for the construction of a BESS over two stages – Stage 1 being for 250MW and up to 500 MWh, and Stage 2 being an increase up to 500MW and up to 1000MWh of storage capacity. The proposal includes installation of enclosures, inverters, transformers and control building, installation of a transmission line to Tamworth substation, realignment of the existing 330kV transmission line on the site, site access, office and amenities, utilities, stormwater management and landscaping. The project is currently at EIS preparation stage.

There is potential for the project to generate cumulative impacts with these other BESS proposals should they proceed, namely regarding visual, noise and construction impacts. This is discussed in further detail in Section 6.14.

2.6 Alternatives considered

This section provides an examination of possible alternatives to this project. There are two possible alternatives as follows:

1. Do not proceed with the Project, or
2. Proceed with the project in an alternate location.

This first alternative to not proceed with the Project would result in the loss of a project that would support and stabilise NSW's electricity grid. Moreover, the associated economic and social benefits (discussed in Section 7.9 of this EIS) anticipated to arise from the project would be lost. As such, the first option would represent an opportunity cost to the public interest.

The second alternative to proceed with the Project in a different location would result in a poorer environmental planning outcome. The site was selected after a comprehensive assessment of electrical supply and demand across NSW, which included a review of AEMO 2022 ISP and future demand expectations. Once a suitable substation had been identified (i.e. Tamworth Substation), all land within 2km of the substation was assessed for constraints and opportunities. This included flora and fauna limitations, existing land use and zoning, distance from dwellings, land availability, transmission line availability, and flooding. This assessment also included a review of the strategic planning objectives of Tamworth and Calala to ensure the site was not identified as being needed for future urban growth. This assessment resulted in the current site being identified as being the most suitable across the region, following which a comprehensive due diligence assessment of the Site was carried out by specialist consultants. The size of the site, distance to dwellings, current land use, lack of environment constraints, and existing surrounding major electrical infrastructure means the site is well suited to the proposed use. Proceeding with the second alternative, therefore, would result in a less-than-ideal outcome.

For these reasons, it is considered that the most viable option, resulting in the greatest amount of public benefit, is to proceed with the project at the proposed location. Further discussion regarding site suitability is provided in Section 7.10 of this EIS.

3 Project description

3.1 Overview

Table 6 provides an overview of the Project.

TABLE 6 – PROJECT OVERVIEW

PROJECT ELEMENT	SUMMARY OF THE PROJECT
BESS site identification	57 Burgess Lane, Calala also known as 474 Calala Lane, Calala (Lot 17 DP629969)
BESS site area	Entire lot: 36.24ha BESS footprint: 8.9ha
Underground transmission cable site identification	Location of Underground Transmission Cable: • 57 Burgess Lane, Calala (Lot 16 DP629969) • Burgmanns Lane, Calala (Lot 3 DP244399) • Burgess Lane, Calala (Lot 4 DP244399) • 707 Burgmanns Lane, Calala (Lot 6 DP219993) The length of the underground transmission line is 1,650m.
Battery storage and discharge capacity	300MW/1200MWh
BESS lifespan	25 years
Equipment and structures	Refer to Table 7
Site access	New access driveway off Calala Lane
Construction access route	Access to the development site during construction is gained via Calala Lane
Construction	Construction is expected to take approximately 18 months, with commissioning expected to be completed 3-6 months following completion of construction. Construction would occur during standard construction hours, being: • Monday to Friday: 7:00am to 6:00pm • Saturday: 8:00am to 1:00pm • Sundays and Public Holidays: No work

PROJECT ELEMENT	SUMMARY OF THE PROJECT
	Some activities, such as delivery of oversized plant or structures or emergency work, may occur outside standard hours. The peak construction period is assumed to last for 5 months. This is derived as follows: • Peak traffic generation is approximately a 1-month period as described in Stantec traffic report at Table 6.3. This occurs in Month 2. • Daily Construction Worker numbers peak over a 4 month period between months 3, 4, 5 & 6.
Road works	No road upgrades are proposed as part of this application. Vehicular access will be provided via a new access driveway on Calala Lane which is located approximately 155m off the eastern boundary of the site, requiring works in the road reserve. Additionally, works under the road and within the Burgess Lane road reserve are anticipated to be required for the installation of the transmission cable.
Operation and maintenance	The Project would be operated remotely with occasional maintenance activities generally be undertaken by 7 personnel within the following hours (except where urgent emergency maintenance is required): • Weekdays: 7am to 6pm • Saturday: 8am to 1pm • Sundays and public holidays: no work
Decommissioning and rehabilitation	The site would be progressively rehabilitated during and following the construction period, including removal of the temporary construction facilities. At the end of operational life, aboveground components would be removed and the land rehabilitated to pre-development conditions.
Employment	Construction: 170 jobs Operation: 7 jobs
Hours of operation	24 hours, 7 days per week
Capital investment value	Exceeding $30 million

TABLE 7 – SUMMARY OF PROPOSED STRUCTURES

STRUCTURE	DETAIL
Lithium-ion Battery Storage Enclosures	Quantity: 960
Inverters	Quantity: 120
Distribution Kiosk	Quantity: 6
Transmission Network Service Provider (TNSP) Control Room	Quantity: 1
Control room	Quantity: 1
Switch room	Quantity: 1
Operation and Maintenance Building (identified as “warehouse” on site plan)	Quantity: 1
Water Tank	Quantity: 2 Approximate capacity: 100,000 litres
Switchyard and substation	The auxiliary transformers are around 9m high and the narrow lightning masts are around 25m high.
Northern Noise Attenuation Wall	Approximately 4m high
Western Noise Attenuation Wall	Approximate: 5m high
Chain Wire Fence	Up to 3m high
Transmission Connection	Underground transmission cable approximately 1,650m in length, with above-ground cable terminations at the existing substation as requested by Transgrid.

Figure 9 to Figure 11 show site plans and renders of the proposed BESS. Full-sized drawings are provided in the drawing package at Appendix E.

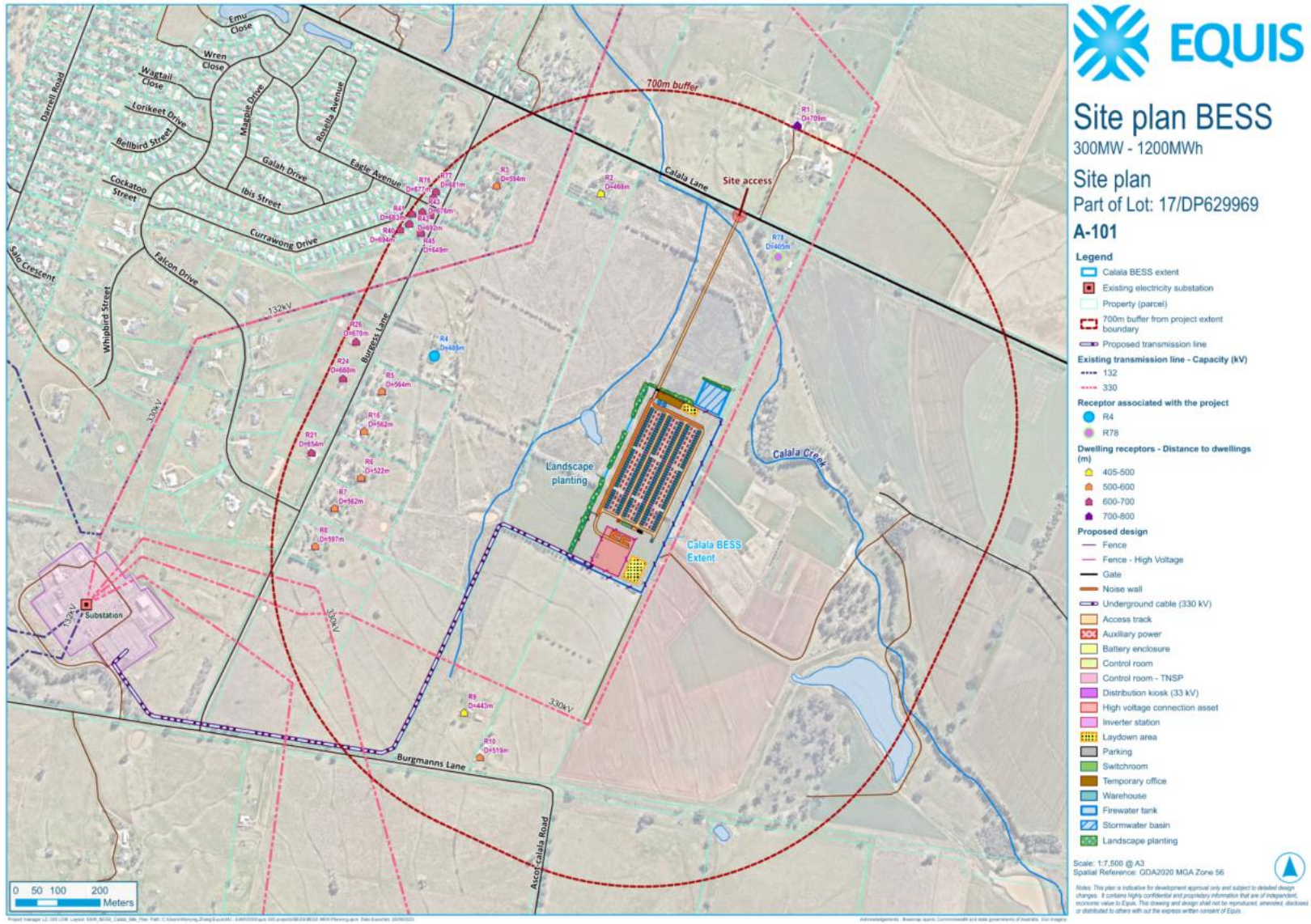


FIGURE 9 – SITE PLAN

Source: Equis

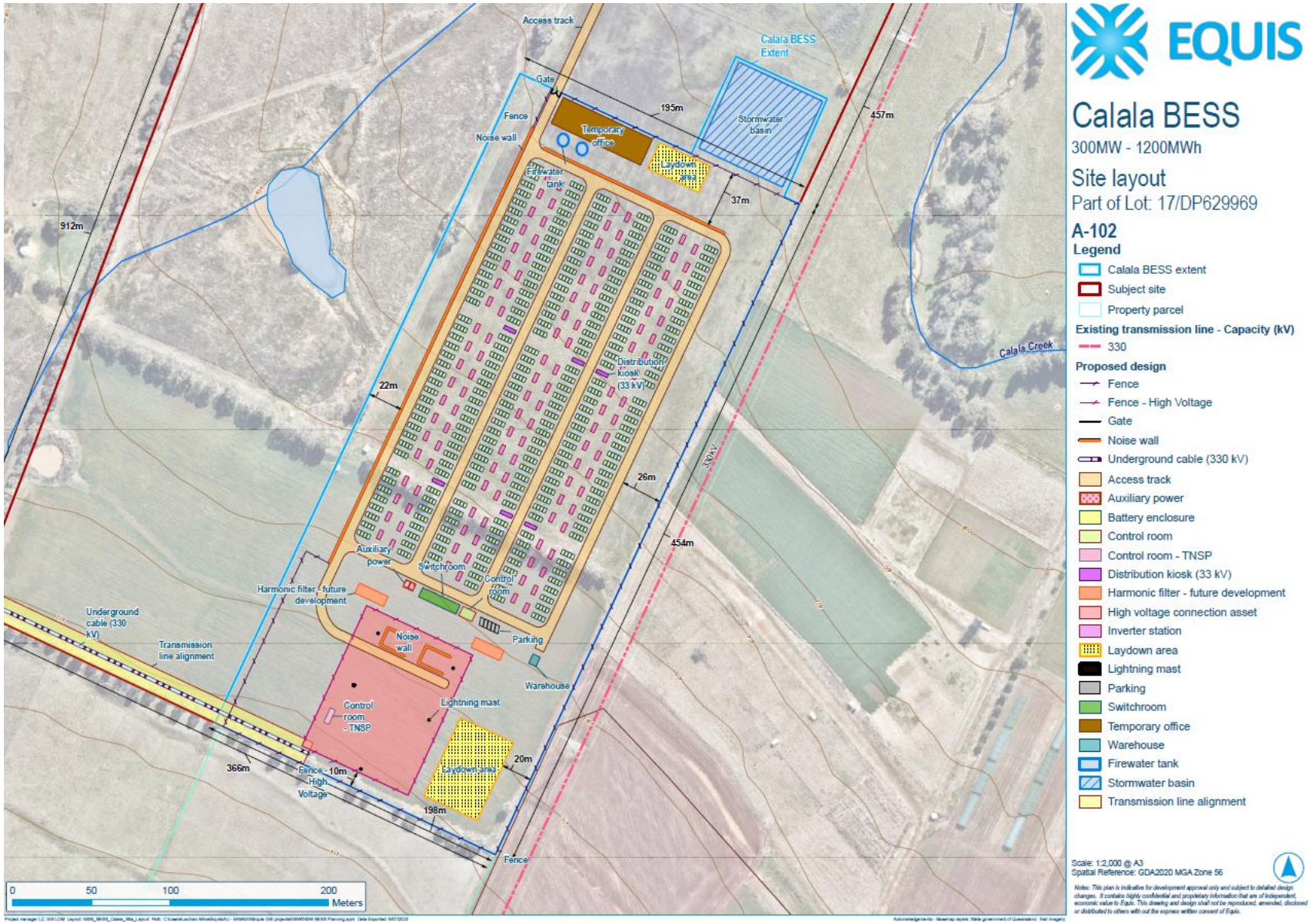


FIGURE 10 – SITE LAYOUT

Source: Equis

FIGURE 11 – BIRD'S-EYE VIEW OF THE PROJECT ON COMPLETION LOOKING EAST

Source: Equis

Note: Renders are for illustrative purposes only. The aboveground transmission lines and 330kV lattice towers pictured are existing features.

3.2 Site establishment

3.2.1 Earthworks

Some ground levelling would be required to provide suitable pad areas to accommodate the BESS infrastructure. A maximum fill depth of 3.0m is proposed on the northern component of the proposed BESS boundary, and a maximum excavation depth of 2.5m is proposed on the southern boundary of the proposed BESS boundary. A total cut of 35,605m^3 and fill of 37,847m^3 is proposed, resulting in a balance of 2,241m^3 of fill to be imported. The potential for reusing the soil will be contingent on the prevailing geotechnical conditions. However, the design approach prioritizes the minimization of soil movement both into and out of the site. A bulk earthworks plan is provided in the civil engineering package at Appendix G.

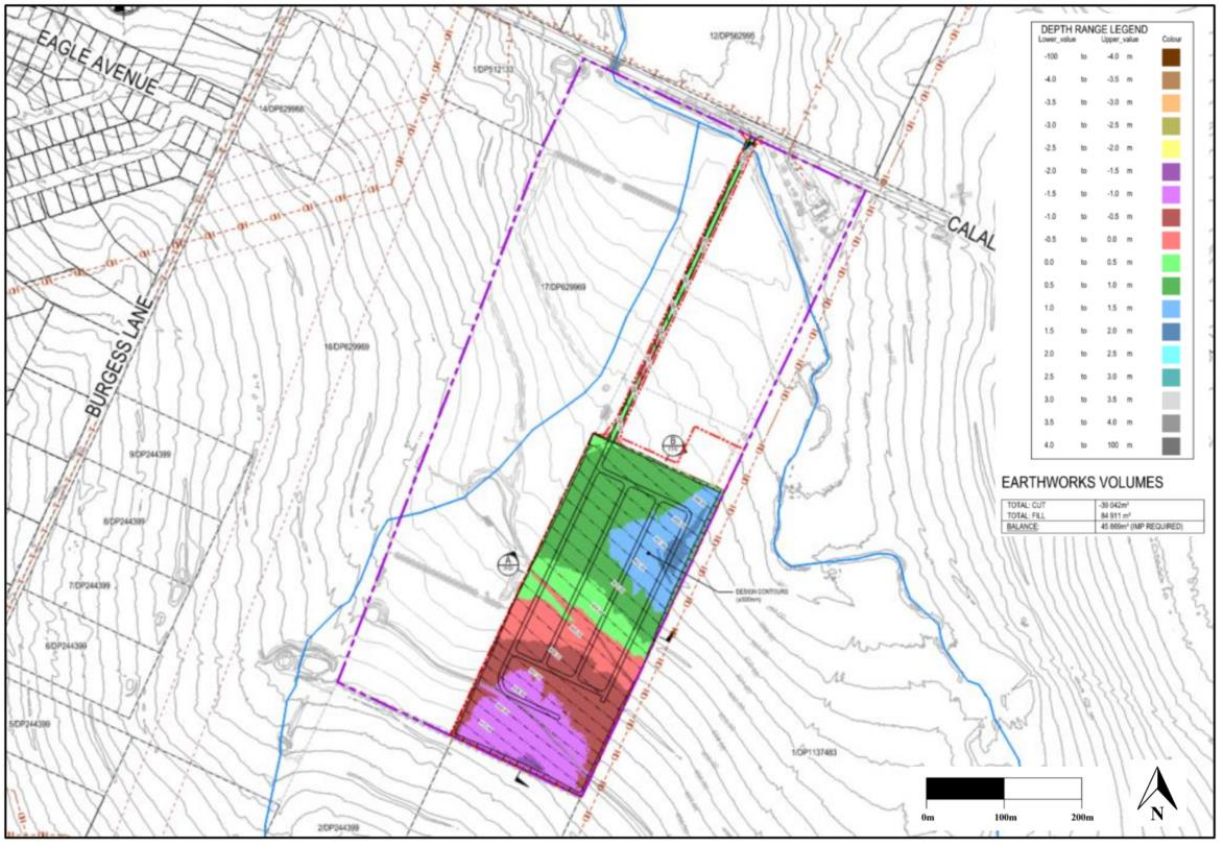


FIGURE 12 – EXTRACT OF EARTHWORKS CUT AND FILL PLAN

Source: Sky Engineering & Project Management

3.2.2 Sediment and Erosion Control

Erosion and sediment control measures will be installed prior to the commencement of works for the project, including a sediment fencing surrounding the proposed stockpile and the length of the eastern and northern boundary of the proposed development site. Stormwater will be directed to the temporary sediment basin via diversion drains. Refer to the sediment and erosion control plan provided in the Civil Engineering Concept Plan at Appendix G.

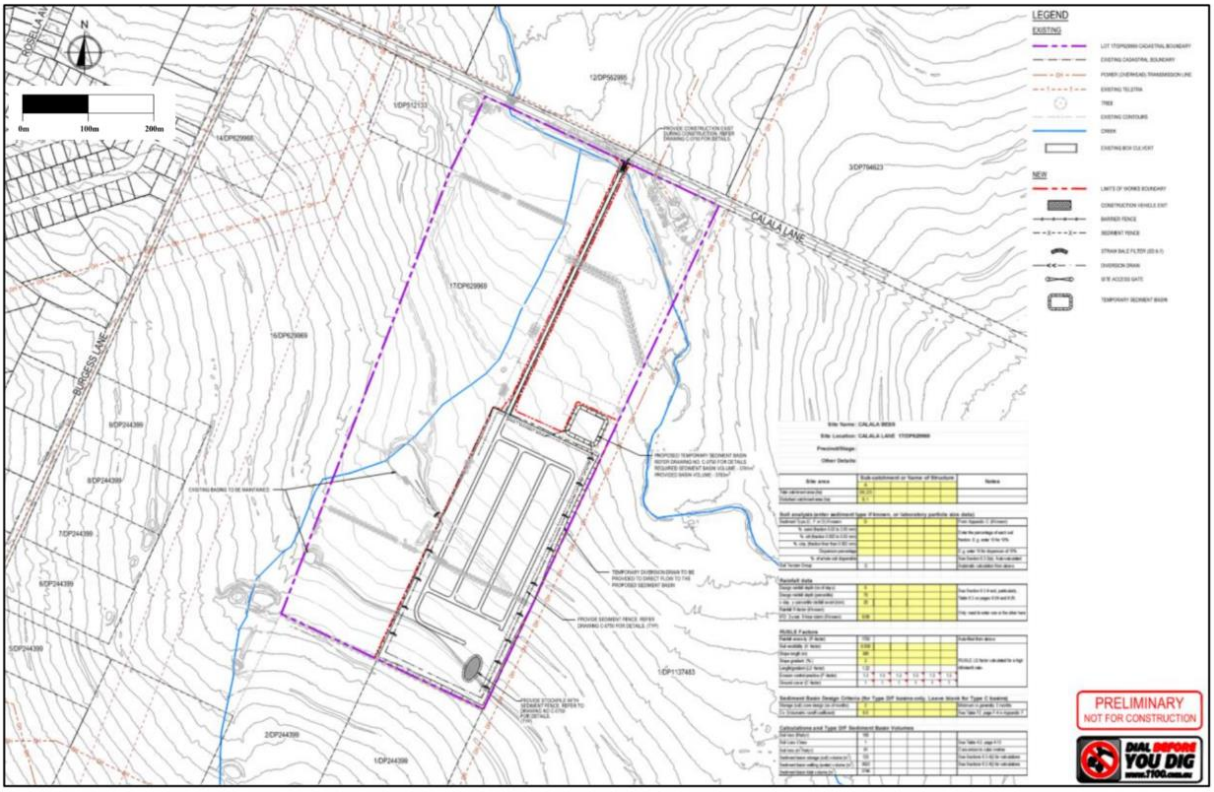


FIGURE 13 – EXTRACT OF EROSION AND SEDIMENT CONTROL PLAN

Source: Sky Engineering & Project Management

3.3 Physical layout and design

The physical layout of the BESS, shown in Figure 10**,** generally comprises of rows of battery enclosures, inverter stations, and distribution kiosks bisected by access tracks and enclosed by a security fence. A temporary office, water tank and laydown area are located in the northern section of the enclosed area, while switchrooms, a control building, parking space, small warehouse, harmonic filters and laydown area are located in the southern section. A stormwater basin is also located outside of the enclosed area to the north. The proposed transmission cable connects to the BESS at the southern end of the site at the high voltage connection asset.

3.3.1 Batteries

The proposed BESS contains enclosed lithium-ion batteries, which will be manufactured offsite and delivered to the site for installation. The specific number and arrangement of battery enclosures, inverter stations, and additional auxiliary equipment will be finalised and confirmed during detailed design. However, the location of this equipment would be limited to the areas shown on the site layout plan at Figure 10. Each battery enclosure would be approximately 2.8m high x 9.5m long x 3.2m wide.

For the purposes of the assessment of the BESS, a conservative approach was taken, whereby the maximum area and quantities of the infrastructure was considered.

3.3.2 Inverter stations

120 inverter stations will be installed and located at regular intervals across the BESS area. The inverter stations will invert DC power to AC power, and to step up voltage to 33kV. Each station would measure up to approximately 3.1m high x 6m long x 2.4m wide.

3.3.3 Distribution kiosks

Six distribution kiosks are proposed in the BESS area to supply battery and auxiliary loads in the yard. Each would measure up to approximately 2.9m high x 8m long x 2.5m wide.

3.3.4 TNSP control room

One TNSP control room is proposed for transmission network service provider use (e.g. Supervisory Control and Data Acquisition (**SCADA**), protection switchgear, monitoring, and other control activities). It would measure up to approximately 4.1 m high x 10m long x 2.7 m wide.

3.3.5 Switchroom and control room

One switchroom and one control room will be located on the site immediately to the south of the battery enclosure. The control room will be used for SCADA and other monitoring activities. The switchroom includes switches, circuit breakers, and Ring Main Units (**RMUs**). The switchroom would measure approximately 4.1m high x 25m long x 2.7m wide. The control room would measure 4.1m high x 9.1m long x 2.7m wide.

3.3.6 Operation and Maintenance Building

The Operation and Maintenance Building (identified as “warehouse” on site plan) will be used as an operation and maintenance building to store safety parts for the BESS. It will measure approximately 4m high x 8m long x 5.1m wide.

3.3.7 Transmission

The electrical connection from the BESS to the nearby Transgrid 330kV Tamworth substation would be via a 330kV underground power cable running through neighbouring properties, namely Lot 16 DP629969, Lot 3 DP244399 (ETMHC), Lot 4 DP244399 (ETMHC), and Lot 6 DP219993 (ETMHC). It is noted that the transmission cable will cross underneath Burgess Lane.

The approximate route of the underground cable has been identified but is subject to detailed design considerations in consultation with Transgrid.

Land within the nominated transmission cable area generally comprises grassland. Any future vegetation growth within the easement would be maintained to mitigate fire risk and allow safe operation of the powerline.

3.3.8 Access and internal tracks

A new driveway off Calala Lane will be constructed to provide access to the BESS. Movement within the BESS area will be via internal all weather trafficable unsealed access tracks running the full length of, and around, the battery enclosures.

3.3.9 Security fencing

The perimeter of the BESS area will be fenced with up to a 3m-high chain-link security fencing. An access gate will be installed at the driveway entry into the BESS facility. High-voltage security fencing around the TNSP control room is proposed to meet the requirements of the relevant standards.

3.3.10 Vegetation screening

The development is located on low-lying land and does not propose a significant change to the existing topography. Tree removal is proposed and will impact the existing landscape features and result in greater visibility of the site. The Landscape Character and Visual Impact Assessment (**LCVIA**) in Appendix N recommends that perimeter screen planting around the proposed development on the northern and eastern boundaries. Due to maintenance and safety concerns, vegetation screening cannot be provided on the eastern or southern boundaries.

3.3.11 Acoustic shielding

Based on the findings of the Noise and Vibration Impact Assessment (**NVIA** - Appendix O), a 4m noise barrier will be installed along the northern side of the battery enclosure area, a 5m high noise barrier along the western edge and a 4m near-field barrier around the HV transformers. The exact material of the barrier is yet to be determined and will be selected at the detailed design phase but is expected to have a minimum surface density of 20kg/m^2. Construction materials that meet this requirement include 3mm thick steel (e.g., Bluescope HW350 – Corten), 40mm thick timber, 10mm thick glass, 18mm thick Perspex or polycarbonate, and 75mm thick brick or concrete.

The conceptual location of the proposed noise attenuation control is as per Figure 14**.**

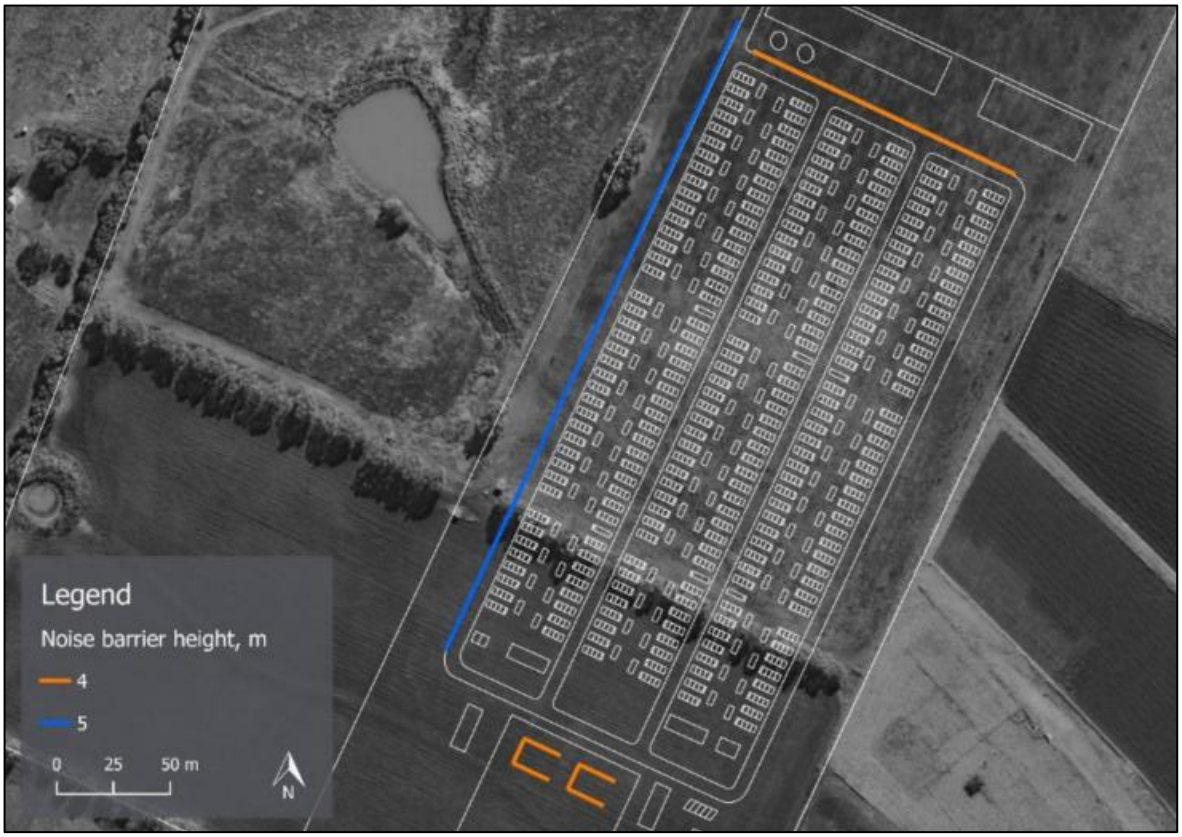


FIGURE 14 – PROPOSED NOISE ATTENUATION WALL

Source: Marshall Day Acoustics

3.4 Timing

3.4.1 Stages

The project would be delivered as a single construction stage lasting approximately 18 months. Specific construction elements are discussed further below. Subject to approvals, construction is expected to commence in the second half of 2024.

3.4.2 Phases

The Project would involve 3 phases:

- Construction,
- Operation, and
- Decommissioning and rehabilitation.

Each phase is discussed in detail below.

3.4.2.1 Construction

Timeframe

Construction of the Project would take approximately 18 months. The works would occur as per the following indicative steps (with some overlap):

- site establishment;
- delivery of BESS infrastructure;
- installation of BESS infrastructure;
- transmission cable construction; and
- testing and commissioning.

The peak construction period would occur during the second step, delivery of BESS infrastructure. The peak construction period is assumed to last for 5 months. This is derived as follows:

- Peak traffic generation is approximately a 1-month period as described in Stantec traffic report at Table 6.3. This occurs in Month 2.
- Daily Construction Worker numbers peak over a 4-month period between months 3, 4, 5 & 6.

Construction hours

Construction works are to be undertaken during standard working hours:

- Weekdays: 7am to 6pm;
- Saturday: 8am to 1pm; and
- Sundays and public holidays: no work.

However, it is anticipated that some activities, such as delivery of oversized plant or structures or emergency work, may occur outside standard hours. For occasions where OSOM deliveries must be carried out during night periods, potentially affected residents close to the site will be informed prior.

Personnel and equipment

The BESS will result in 170 employment opportunities during construction, of which it is anticipated that a maximum of approximately 85 construction personnel would be required on site during the peak construction period. Construction supervisors and the construction labour force are to be hired locally where possible. Workers would be accommodated in existing accommodation. Equipment used during construction is anticipated to include earth-moving equipment for civil works, diesel generators, trucks and cranes, as well as smaller handheld power tools.

Materials

The following general construction materials would be transported to the site from nearby towns and regional centres, including Tamworth:

- aggregate for BESS area;
- sand for burying of cables;
- concrete for the foundations
- water for dust suppression (depending on weather conditions), vehicle washdown and drinking water.

Quantities would be determined during detailed design.

3.4.2.2 Operation

Upon completion of the construction works and connection to the Tamworth substation, the BESS would commence operation. The BESS will operate 24 hours, seven days a week however operational activities would involve routine operations and maintenance by approximately seven personnel, including:

- routine visual inspections and general maintenance;
- site security; and
- replacement of equipment and infrastructure, as required.

No vehicles will be present on the site on a permanent basis; there would be only occasional visits by standard vehicles. Additional vehicles may visit the site for a limited period during major maintenance operations.

Maintenance operations are to be undertaken during standard working hours (unless emergency works are urgently required):

- Weekdays: 7am to 6pm;
- Saturday: 8am to 1pm; and
- Sundays and public holidays: no work

The operational phase of the project would have a lifespan of up to 25 years. There may be potential for the development to be upgraded to extend the operational life, but any extension would be subject to appropriate approvals.

3.4.2.3 Decommissioning and rehabilitation

At the end of operation, all aboveground infrastructure would be removed. Key elements of decommissioning include:

- removal of the BESS, including any foundation posts, for recycling or reuse;

- removal of site amenities and equipment for recycling or reuse;
- removal of fencing including small concrete footings; and
- rehabilitation of disturbed soils in consultation with the relevant landowner for resumption of agricultural use, or other use as agreed with the landowner.

At decommissioning of the BESS facilities (or other electrical infrastructure), internal cabling and connection to the nearby substation will be removed, although the underground transmission cables may be left in place subject to agreement with the landowner to avoid disturbance to the local ecosystem if it is considered safe to do so. However, the cable can be excavated from the ground and recycled should this be deemed appropriate at the time.

The majority of infrastructure removed during decommissioning is expected to be able to be recycled or repurposed, and this will be determined at the time of decommissioning and in accordance with statutory requirements at that time. A decommissioning specific WMP will be prepared prior to the commencement of the BESS decommissioning.

3.5 Subdivision

No form of subdivision is proposed as part of this proposal.

4 Statutory context

TABLE 8 – STATUTORY REQUIREMENTS FOR THE PROJECT

CATEGORY	ACTION REQUIRED
Power to grant approval	The project is consider a SSD under Section 2.6 of the Planning Systems SEPP as: • the development is not permissible without development consent under Part 4 of the EPA Act; and • the development is specified in Schedule 1 (Clause 20) as a development for the purpose of electricity generating works with a capital investment of greater than $30m. Section 4.5(a) of the EP&A Act and Section 2.7 of the Planning Systems SEPP provide that the consent authority for SSD is the Independent Planning Commission if: • there are 50 or more unique public objections to the application; • the applicant has made a reportable political donations disclosure; or • the local council has objected to the application and has not withdrawn the objection following exhibition. Otherwise, the consent authority will be the Minister.
Permissibility	The proposed BESS Site and transmission cable route is located within land zoned RU4 Primary Production Small Lots under *Tamworth Regional LEP 2010* (TRLEP 2010). “Electricity generating works”, as defined below, are permitted with consent in the RU4 zone: ***Electricity generating works*** *means a building or place used for the purpose of—* *(a) making or generating electricity, or* *(b) electricity storage* The Project is for a building/place used for electricity storage and is therefore permitted with consent under TRLEP 2010. The Project is also permitted with consent under section 2.36(1)(b) of *State Environmental Planning Policy (Transport and Infrastructure) 2021* (**Transport and Infrastructure SEPP**) which states that development for the purposes of electricity generating works can be carried out by any person with consent on land in a prescribed rural zone. Zone RU4 Primary Production Small Lots is a prescribed rural zone, and therefore the proposal is permitted with consent under the Transport and Infrastructure SEPP.
Other approvals	**Consistent Approvals**

	An approval under section 138 of the *Roads Act 1993* for any road upgrades or works on the public road network may be required. This approval is considered a “consistent” approval (i.e., approvals that cannot be refused if the Project is approved and must be substantially consistent with the approval). If required, this approval will be sought before construction commences. It is understood an environment protection license under the *Protection of the Environment Operations Act 1997* (POEO Act) is not required. The Project does not meet the definition of “electricity works (wind)” or “general electricity works” under Schedule 1 of the POEO Act because it does not *generate* electricity. **Other Approvals** Prior to construction, a Class 1 OSOM vehicle access permit application (or other relevant approval) will be obtained when and where required to accommodate the OSOM vehicles required for delivery of project components to the site. It is noted that if the water to be used to construct and operate the project is to be obtained from any source other than water mains (e.g., groundwater, rivers and creeks), water access licences under the *Water Management Act 2000* (WM Act) will generally be required to authorise the extraction of the water. However, water for construction and operational stages will be ‘trucked in’ and the development will not rely on groundwater, rivers, or creeks for water sourcing. As such, it is not anticipated that any water access licences under the WM Act will be applicable. **Approvals Not Required** A water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under Section 91 of the *Water Management Act 2000* (WM Act) will not be required pursuant to section 4.41 of the EPA Act.
Pre-condition to exercising the power to grant approval	Refer to Table 9.
Mandatory matters for consideration	Refer to Table 9

TABLE 9 – PRE-CONDITION TO EXERCISING THE POWER TO GRANT APPROVAL AND MANDATORY MATTERS FOR CONSIDERATION

STATUTORY INSTRUMENT	PRE-CONDITION OR CONSIDERATION	RESPONSE
EPA Act – Section 1.3	The objectives of the EPA Act.	Refer to Table 10.
EPA Act – Section 4.15	Relevant environmental planning instruments: • *Tamworth Regional Local Environmental Plan 2010* • *State Environmental Planning Policy (Biodiversity and Conservation) 2021* • *State Environmental Planning Policy (Transport and Infrastructure) 2021* • *State Environmental Planning Policy (Resilience and Hazards) 2021*	See further detail below.
	Relevant proposed environmental planning instruments	Not applicable. There are not proposed EPIs of relevance to this application.
	Development control plans: • Tamworth Regional Development Control Plan 2010	Section 2.10 of the Planning Systems SEPP states that development control plans do not apply to State significant development. Nonetheless, the Tamworth Regional Development Control Plan 2010 (TRDCP 2010) has been considered during preparation of this EIS. The TRDCP 2010 contains no specific controls relating to BESS facilities or other energy infrastructure. Overall, it has been found that the proposal is consistent with the overall aims of the plan.
	The likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality. • The suitability of the site for the development • The public interest	Refer to sections 7.9 and 7.10 of this EIS.

Biodiversity and Conservation Act 2016	Under section 7.9 of the *Biodiversity Conservation Act 2016* (BC Act), any SSD or State significant infrastructure application is required to be accompanied by a Biodiversity Development Assessment Report unless the Planning and Environment Agency Heads determine that the proposed development is not likely to have any significant impact on biodiversity values. Furthermore, section 7.14 specifies that the Minister is to take into consideration the likely impact of the proposed development on biodiversity values as assessed in the biodiversity development assessment report. The Minister for Planning may (but is not required to) further consider the likely impact of the proposed development on biodiversity values	The proposed development is supported by a Biodiversity Development Assessment Report (BDAR) prepared by Biosis contained in Appendix H. The BDAR finds that consideration has been given to avoiding and minimising impacts to biodiversity where possible during the assessment and preliminary and concept design. Mitigation and management measures will be put in place to adequately address impacts associated with the Project, both direct, indirect and prescribed. Offsets are required to be secured for the Project for impacts to PCTs 84 and 599, and five threatened flora species assumed present, in total 30 ecosystem credit offsets and 86 species credit offsets are required under the BAM.
State Environmental Planning Policy (Planning Systems) 2021	The Planning Systems SEPP relevantly operates to define development that is SSD. A development application is declared to be SSD if the development is not permissible without development consent under Part 4 of the EPA Act, and the development is specified in Schedule 1.	The project is declared to be SSD as *electricity generating works* are not permissible without development consent, and the project is specified in Schedule 1 for the purpose of electricity generating works with a capital investment of greater than $30m.
State Environmental Planning Policy (Resilience and Hazards) 2021	Section 3.7 of *State Environmental Planning Policy (Resilience and Hazards) 2021* (**Hazards SEPP**) requires the consideration of current circulars or guidelines prepared by the Department of Planning in determining whether a development is a hazardous storage establishment, hazardous industry or other potentially hazardous industry; or an offensive storage establishment, offensive industry or other potentially	The current relevant guidelines are the *Hazardous and Offensive Development Application Guidelines – Applying SEPP 33* published by the Department of Planning in 2011. These guidelines include the screening tests to be used to determine whether a development is a potentially hazardous development. If the screening tests indicate that a development is potentially hazardous development, a preliminary hazard analysis (**PHA**) is required to be provided as part of the development application. The type of screening test to be used is dependent upon the class, as categorised under the *Australian Dangerous Goods Code* (**ADG Code**) published by the National Transport

offensive industry. Where a conclusion is reached that a project is a potentially hazardous or offensive development, a PHA must be prepared.	Commission in 2020, of dangerous goods proposed to be accommodated on-site. The dangerous good associated with BESS are lithium batteries, which are a class 9 dangerous good under the ADG Code. Under the guidelines, class 9 goods do not exceed the screening thresholds because they pose little threat to people or property. A PHA has been prepared to consider hazard risks associated with the installation and operation of batteries on the land—refer Section 6.10. Based on the findings of the PHA, the likelihood of offsite impacts is unlikely. It is concluded that the risks at the site boundary are not likely to exceed the acceptable risk criteria.
Section 4.6(1) of the Hazards SEPP states that a consent authority must not consent to the carrying out of development unless it is satisfied that the land is not contaminated. If the land is contaminated, the consent authority must not consent to the carrying out of development unless it is suitable for the proposed use in its contaminated state or will be suitably remediated before the land is used for that purpose.	A search of the NSW EPA Contaminated land record was completed for contaminated sites within Tamworth LGA. The following 5 known contaminated sites, none of which are located in Calala, were identified: • Duri Store at 13 Railway Avenue, Duri (approximately 15.8km to southwest); • Coles Express Tamworth at 251-253 Goonoo Goonoo Road, South Tamworth (approximately 4.9km to northwest); • Elgas Depot at 115 Marius Street, Tamworth (approximately 7.2km to northwest); • Gunnedah Road site at 49 Bunnedah Road, Tamworth (approximately 7.6km to northwest); and • Woolomin Gold Rush Store at 65 Nundle Road, Woolomin (approximately 25km to southeast). The Preliminary Site Investigation (PSI) contained in Appendix T identifies that the site has been used for agricultural purposes, and that a review of the NSW Spatial Services Historical Imagery Viewer confirms that the site has not been used for other potentially contaminating sources. The potential sources of contamination for the agricultural land use include contamination from pesticides and fertilisers. As such, a site inspection and soil sampling were undertaken by ENV Solutions at the site including along the proposed transmission cable. The PSI concludes that the site is suitable for the proposed use. Given the results of the PSI, it is considered that the site is

		unlikely to be contaminated, and therefore the proposed use is acceptable in the context of section 4.6(1) of the Hazards SEPP.
State Environmental Planning Policy (Biodiversity and Conservation) 2021	Chapter 4 aims to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas and to reverse the current trend of koala population decline. Although Tamworth Regional Local Government Area is identified in Schedule 2 and the subject site is located in the RU4 – Primary Production Small Lots, this chapter has no effect. Section 4.9 applies to the land, but the relevant provisions apply to actions taken by council. Because the consent authority is not council in this instance, the chapter has no effect.	Notwithstanding, the non-applicability of Chapter 4, the site does not provide any habitat for Koalas and the provisions of Chapter 4 are therefore considered to not apply to the proposed development.
State Environmental Planning Policy (Transport and Infrastructure) 2021	Section 2.42 of the State Environmental Planning Policy (**Transport and Infrastructure**) 2021 (Transport and Infrastructure SEPP) requires that development in a "regional city" for the purpose of electricity generating works using a wind or solar energy source that is State or regionally significant development must not be granted unless it is located to avoid significant land use conflict and is unlikely to have a significant impact on the city's capacity for growth or scenic quality and landscape character. The Project is within a regional city as defined by Transport and Infrastructure SEPP mapping (Tamworth), meets the definition of "electricity generating works" as defined under the Transport and Infrastructure SEPP, and is SSD. Therefore, this section of the Transport and Infrastructure SEPP is relevant.	Impacts to scenic and landscape character are addressed in Appendix N and Section 6.5 of this EIS; it has been found that the impact on the landscape character of the area will not be significant. Impacts to Tamworth's capacity for growth is addressed in Section 2.2 of this EIS. In summary, it has been found that the Project will not reduce the city's capacity for growth. Section 2.48 of the Transport and Infrastructure SEPP requires that development within or adjacent to an electricity easement or adjacent to a substation be referred to the relevant electricity supply authority. There is a transmission line easement within the site, and the proposed transmission line easement crosses multiple transmission line easements and connects to the Tamworth substation. As such, the application must be referred to the electricity supply authority.

TABLE 10 – OBJECTS OF THE ACT

OBJECT	CONSISTENCY
1. 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 for grid firming and will otherwise support the penetration of renewable energy sources in NSW. 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. The impacts have been summarised in Section 6.
2. 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 economic, environmental and social context of the project and its potential impacts to allow informed consideration of these aspects in determining the application. The project provides energy storage and dispatchable firming to support renewable energy projects being developed in the region and throughout NSW.
3. To promote the orderly and economic use and development of land.	The orderly and economic use of land is best served by development that is permissible under the relevant planning regime and predominately in accordance with the prevailing planning controls. The project comprises a permissible development, which is consistent with the statutory and strategic planning controls and is in close proximity to similar land uses including the Tamworth substation and surrounding transmission lines. As detailed in this EIS, the project will result in positive economic impacts, with appropriate mitigation measures and management strategies being proposed to reduce any adverse environmental and social impacts.
4. To promote delivery and maintenance of affordable housing.	Not applicable to the project.
5. To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats.	Direct impacts on the environment have been avoided and/or minimised through site selection and through design by minimising distances to the Tamworth substation and by avoiding impacts to vegetation and riparian lands, including through the use of directional boring. Indirect impacts will be managed and mitigated through the implementation of the biodiversity management measures detailed in Section 6.1 and Appendix H.
6. To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).	The project will have no adverse impacts on cultural or built heritage values as described in Section 6.2 and Section 6.3.
7. To promote good design and amenity of the built environment.	Potential visual and noise impacts on sensitive receivers and the broader community have been assessed in Sections 6.5 and 6.6, respectively. Overall, no significant adverse impacts are

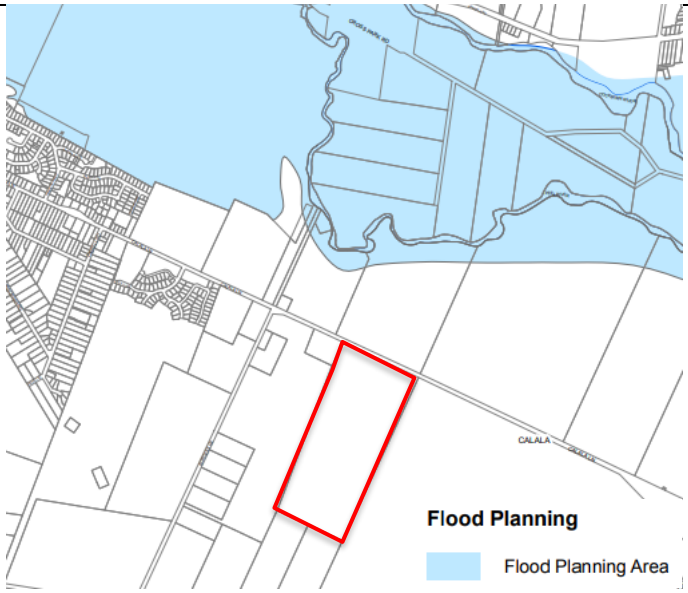
OBJECT	CONSISTENCY
	anticipated, subject to mitigation and management measures being applied.
8. To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants.	Over the life of the project, infrastructure will be maintained, or upgraded, to ensure safe and efficient operations. All construction associated with the project will be compliant with the Building Code of Australia and all other relevant statutory requirements.
9. To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State.	The project is subject to the provisions of Part 4 of the EP&A Act, and the Minister for Planning and Public Spaces or Independent Planning Commission will be the consent authority. Notwithstanding, Council, as the local government authority, has been consulted throughout the planning phases of the project and preparation of this EIS (refer Section 5). As such, it is deemed that both local and State levels of government have been provided with sufficient opportunities to share in responsible environmental planning of the project.
10. To provide increased opportunity for community participation in environmental planning and assessment.	As described in Section 5 of this EIS, there have been a range of engagement activities to inform the community about the project and to seek community (and other stakeholders) feedback. This EIS provides further detailed information regarding the project and its potential impacts. It will be placed on public exhibition by DPE, and community members will be able to make formal submissions. A report will be prepared responding to these submissions.

4.1 Tamworth Regional Local Environmental Plan 2010

Table 11 addresses key relevant sections of TRLEP.

TABLE 11 – TAMWORTH REGIONAL LOCAL ENVIRONMENTAL PLAN 2010 ASSESSMENT

CLAUSE	COMPLIANCE
Land use	As discussed in Table 8**,** the Project is development permitted with consent, being development for the purposes of “electricity generating works” in Zone RU4 Primary Production Small Lots.
4.3 Height of buildings	The site is not subject to a height of buildings control.
4.4 Floor space ratio	The site is not subject to a floor space ratio control.
5.21 Flood planning	The subject site is not located on land identified within the Flood Planning Area as per the Flood Planning Map in the LEP.

CLAUSE	COMPLIANCE
	 Consideration has been given to the impacts of flooding from Calala Creek which traverses the property. This is discussed in further detail in Section 6.9 and Appendix Q.
7.1 Earthworks	The Project involves ancillary earthworks for the purposes of creating a suitable pad for the BESS facility and underground transmission cable. The earthworks are considered acceptable under this clause.

5 Engagement

Consultation has been undertaken in accordance with SEARs requirements with the Departments Energy Assessment team and other state agencies, Tamworth Regional Council, service providers, community groups, and affected landowners.

A comprehensive Engagement Report prepared by Equis is attached at Appendix C of the EIS.

Key consultation activities and outcomes are outlined below.

5.1 Engagement activities

As part of the stakeholder analysis and identification of the most appropriate engagement methodology, engagement and consultation with the community will be undertaken over five phases as outlined in Table 12 below.

TABLE 12 – ENGAGEMENT ACTIVITY SUMMARY

PHASE	PURPOSE	ENGAGEMENT ACTIVITY
1	Raise awareness	• Set up project webpage & online engagement platform • Conduct locality desktop assessment and stakeholder mapping • Initial social impact scoping • Establish communication hotlines • Meet with council engagement teams and planners • Engage with landowner hosts, neighbours and other grass roots organisations. • Prepare print materials for phase 2 - FAQ's, letters, flyers, brochures, posters, core flutes, and banners • Prepare infographics and short videos • Prepare media campaigns for phase 2 (radio, print, social)
2	Capture community input	• Finalise any work on print and promotional material • Continue work with grassroots community stakeholders to socially scope and develop draft ideas for a community benefit plan. • Consult with council • Plan information sessions • Launch media campaigns • Deliver information sessions • Meet with stakeholders as required • Prepare online surveys
3	Respond to stakeholders during public notification period	• Prepare print and promotional materials for phase 3 • Launch medial campaign for this stage • Deliver additional information sessions as required • Monitor media
4	Construction, then operation	• Engage with directly affected stakeholders • Send out construction notices, letters and advice notices • Plan further information sessions if needed • Deliver additional information sessions as required • Prepare evaluation surveys
5	Finalise and evaluate feedback	• Email participants to thank them for their contribution • Finalise a summary engagement report

In relation to the above, the following has occurred:

- **Phase 1:** From May 2022 to 10 December 2022.
- **Phase 2:** From 11 December 2022 to 31 October 2023.

Following identification of the relevant stakeholders, Equis conducted the following engagement activities:

- Dedicated website for Calala BESS with 511 page views and 146 registered users,
- Online and printed FAQs with 300 downloads from the eHub project page,
- Promotion of community information sessions on community Facebook pages,
- Radio advertisements on local radio stations reaching approximately 73,000 people,
- Advertisement in Northern Daily Leader Paper reaching 18,866 in print and 98,999 digital,
- Emails and mail drops,
- Phone calls, and
- Online or in person meetings.

A summary of the dates and timeframes of engagement undertaken is provided in Table 13 below.

TABLE 13 – ENGAGEMENT ACTIVITIES TIMELINE

DATE	ENGAGEMENT ACTIVITY
26 May 2022	Pre-lodgement meeting with Tamworth Regional Council. Council identified key issues being noise, visual impact in relation to nearby dwellings, traffic, access and transport particularly during construction, and cumulative impacts associated with the Tamworth BESS.
September 2022	Online engagement platform - ongoing
29 September 2022	A mail out was sent to all residents within 1.2km of the project site.
10-14 October 2022	Face to face meetings with nearby landholders within 750 metres of the project site.
2-14 December 2022	Newspaper, radio and online advertising campaign
14 December 2022	Community information session
October 2023	Community newsletter/FAQ issued to surrounding residents, follow up 1:1 discussions with individual landholders to discuss FAQ with interested parties. Details of the newsletter are recorded in the Engagement Summary and the newsletter .

5.2 Consultation with Tamworth Regional Council

Preliminary discussions regarding community benefit initiatives were discussed with Michaela Stevens at Tamworth Regional Council via telephone on 18 August 2022.

Site access and traffic impacts were discussed with Council during a pre-application meeting on 26 May 2022.

Construction worker accommodation was discussed with Judy Coats on 14th December 22 at the Calala BESS information session.

Council was contacted via email on 10 October 2023 requesting a meeting to discuss the proposed development. A response was received from Council on 13 October 2023 rejecting the invitation to meet to discuss the project, citing lack of capacity. Details of this email correspondence are recorded in

the Engagement Summary and the newsletter is accessible via the Equis online engagement hub https://equis.engagementhub.com.au/calala-bess.

A comprehensive list of engagements with Council is provided in Table 14 below.

TABLE 14 – ENGAGEMENT WITH TAMWORTH REGIONAL COUNCIL SUMMARY

Engagement with Tamworth Regional Council - May 2022 – October 2023			
Date	**Medium**	**Who**	**Notes / Discussions**
26/5/2022	Meeting	Council Planning Team	The planning team met with Tamworth Regional Council officers to discuss the Project on 26 May 2022. Council provided various comments and identified the following key issues to be addressed as the application progresses: • noise impacts; • visual impact—particularly in relation to the nearby residential dwellings; • traffic, access and transport—particularly in relation to access during construction; and • Cumulative impacts associated with nearby Tamworth BESS proposal at Burgmanns Lane
1/08/22	Phone call	Jody Young	Jody Young Communications & engagement officer. Equis provided introduction to personnel and the project.
3/8/22	Email	Jody Young	Follow up email to Jody providing more information.
9/8/22	Phone call and Email	Amy Crocker	Equis provided information about and discussed the project. Provided web page, engagement hub, emails, and all other contact details. Discussed the hosting of the information session. Amy is a local who also lives at Calala. Amy did not raise any concerns about the BESS.
18/8/22	Phone call	Mikayla Stevens	Mikayla Stevens – Events Coordinator Tamworth Council, Destination Tamworth. Several discussions were held with Mikayla around community benefits. Feedback: Mikayla highlighted that tourism is an important economic driver in the region and suggested that funding to support various festivals would benefit the region as a whole.
Aug 22 – Dec 22	Phone calls & emails	Mickaela Fairall	Mickaela Fairall – PA to Russell Webb. Equis provided information about and discussed the project. Provided web page, engagement hub, emails, and all other contact details. Sent an email reaching out to the Mayor, and informed her that the Mayor's online 'contact us page' was not working.
15/09/22	Phone	Amy Crocker	Reach out to Council team to schedule a meeting when Equis representative/s are in Tamworth door knocking. The team indicated they were all working from home due to an asbestos issue, therefore were not available to meet for some time.
10/10/22 - 15/10/22	Phone	Yvonne Reception	Reached out to see if there was any possibility of meeting with the council engagement team in Equis' representatives time at Tamworth. The asbestos situation had not yet resolved; therefore, a meeting was not possible.
5/12/22	Phone and Emails	Russell Web Mayor Mickaela Fairall Yvonne	Invitations and reach out before the information session. Provided all the company and project information. Extended an invitation to meet in person.
5/12/22	Email	All council elected members & exec team	An invitation for all the council team to join Equis at the information session on Wednesday 14th December 2022.
6/12/22	Email		Further information for Jody Young
12-14 Dec 22	Email	All council elected members & exec team	Various emails and information session invitation reminder
14/12/22	Information Session	Judy Coats Russel Webb	Judy Coats - Deputy Mayor. Asked about housing for the BESS workers. Informed that Tamworth had a lack of housing availability. Keen to see employment offered locally first and local suppliers prioritised. Supportive of youth skill development.

			Russel Webb – attended the information session. Networked with the team, chatted to the engineers, however did not provide any positive or negative feedback.
25/5/23	Email & Phone call	Yvonne, reception	Reached out to community engagement and Indigenous engagement officers. Yvonne advised that they were in the process of hiring one and will reach out once they have engaged the Indigenous engagement officer.
22/6/23	Email & Phone call	Lisa Rennie Yvonne	Reach out to community engagement and Indigenous engagement officers. Followed up again and spoke to Yvonne and to Lisa Rennie (executive assistant to director). Lisa advised that they have many people away and will get back to us in due course to advise the best person to speak to. Sent Social impact assessment URBIS survey.
7/07/2023	Email	Lisa Rennie Yvonne	Social impact assessment reminder
10/10/2023	Email	Mickala Fairall / Lisa Rennie	Requested meeting with Council staff to discuss the proposal. Response provided on 13 October 2023 rejecting the invitation citing lack of capacity.

Further engagement with the local community is documented in the Engagement Summary enclosed at Appendix C. Please refer to Engagement Summary Appendix D (unredacted version) for full details of resident engagements.

5.3 Consultation with Transgrid

A formal enquiry was lodged with Transgrid regarding the establishment of the Calala BESS connection. Equis received an official response from Transgrid regarding the feasibility of the intended connection and Equis' intent to construct a new Battery Energy Storage System referred to as Calala BESS. The BESS is situated approximately 1.8 km northeast of Transgrid's Tamworth Substation and is planned to be interconnected with Transgrid's network via a newly proposed 330 kV switchbay at the Tamworth Substation 330/132 kV. The grid connection necessitates the installation of a new 330 kV single circuit underground cable, categorized as a Dedicated Network Asset (DNA), extending from the new switchbay at Tamworth to the Calala BESS substation.

Subsequently, consultation with Transgrid has extended to technical design, scoping and pricing of the project. Transgrid's department that deals with new connections is their unregulated arm, Lumea; all new connections are directed by Transgrid to liaise with Lumea.

A Preliminary Works Agreement between Equis and Lumea was executed on 17/07/2023. The core scope of this agreement includes the preliminary design, specification preparation and project procurement plan for all long-lead equipment required to establish an additional bay at Tamworth substation for the connection of Calala BESS.

Equis has provided Transgrid (Electricity Transmission Ministerial Holding Corporation (ETMHC)) with a copy of this EIS, ETMHC has reviewed the EIS and provided landowner consent to lodge the development application.

5.4 Consultation with Government Agencies and Stakeholders

Table 15 below provides a summary of the consultation and engagement activities undertaken with the relevant Government agencies and stakeholders.

TABLE 15 – GOVERNMENT AGENCY CONSULTATION SUMMARY

Business	Date	Who	Discussion/ notes/ Feedback
Tamworth Council	May 22 – July 2023 ONGOING Early Engagement	Russell Webb Mayor 5/12/22 & 14/12/22 & – presence at information session. Judy Coats 14/12/22	Refer to Section 8 above for Council Early Engagement Meeting feedback. Concerns raised re housing for workers given the lack of housing availability in Tamworth. Keen to see employment offered locally first and local suppliers prioritised. Supportive of youth skill

	Meeting 26/05/22	Mikayla Stevens – Events Coordinator Tamworth Council, Destination Tamworth. 18/8/22 and various other dates. Jody Young (3/8/22) Mickaela Fairall Aug-Dec 22 Yvonne 5/12/22, 7/7/23 Lisa Rennie - 7/7/23 Amy Crocker 9/8/22	development. Keen that community benefits can fund festivals, events and tourism supported.
Regional Chamber of Commerce Chair	14/12/22	Tim Coats, Regional Chamber of Commerce Chair	Supportive. Encouraged that we work through the Chamber of Commerce to maximise local employment and supplier opportunities.
Tamworth Local Aboriginal Land Council.	18/7/23	Sam De Forges Operations manager & LALC ranger.	Discuss their new Ranger Program that is still in development. Community funding to support collaborative programs with the RFS to educate the farming and local groups about land management and cool burning, would provide much needed local skills and build resilience. LALC have worked on several initiatives with the NSW RFS.
DPIE NSW	Various dates	Karen McLennan Guy McMullen Bruce Etheridge	They thanked us for reaching out and indicated that they would not have any issues with Farrer High farming the balance of the land. They did not indicate ANY concerns around the proposed BESS.
NSW Rural Fire Service	Oct 22	Bronwyn Waters – District Manager of the NSW Rural Fire Service with the area command of Tamworth, Armidale, Northern Rivers and Dubbo	Collaborative fire and safety training programs with farming communities and landholders, so they become a valuable resource contributing to the region's firefighting efforts. Girls on Fire program, to enlist more women as volunteers in the NSW Rural Fire Service. This includes forums and training opportunities, where women come together, share, learn and contribute. Funding towards building toilet amenities so women feel more supported to participate and provide service to the NSW Rural Fire Service. Indigenous arts program with the Bumbira arts group, to host local arts programs and create artwork for the newly built local command centre.
Transport for NSW	27/10/2023	Alexandra Power (TfNSW) Gerrit Prent (Equis) Ingrid Bissaker (Stantec) Brett Maynard (Stantec) William Xie (Stantec)	A meeting was held with Transport for NSW on 27 October 2023 to discuss the project with respect to construction traffic impacts, the Goonoo Goonoo Road upgrade/Calala Lane intersection works, noting Goonoo Goonoo Road is an approved OSOM vehicle route and both the existing roundabout and proposed future traffic signals layout. The Transport Impact Assessment includes the relevant information requested and discussed at the meeting with TfNSW.
Biodiversity and Conservation Division	July 2023	Ben Ellis - BCD	Biosis, on behalf of Equis, requested draft land category mapping for the area from DPE on 26 July 2023 which was received on 28 July 2023. Biosis used the information provided by DPE as a guide and made amendments as required noting that there are circumstances where potential category 1 land must be mapped as category 2. Further consultation was held between Biosis and Ben Ellis at Biodiversity and Conservation Division via email on 28 July 2023 to discuss technical aspects and land category interpretation.
Aboriginal Employment Solutions (AES)		Damien Allen - Business Manager	A meeting was held with AES to discuss opportunities and maximise the collective success in the area and increase training opportunities for indigenous youth and other locals.

5.5 Community and stakeholder views

A summary of the sentiment and concerns raised by members of the community are summarised in Figure 15 and Table 16 below:

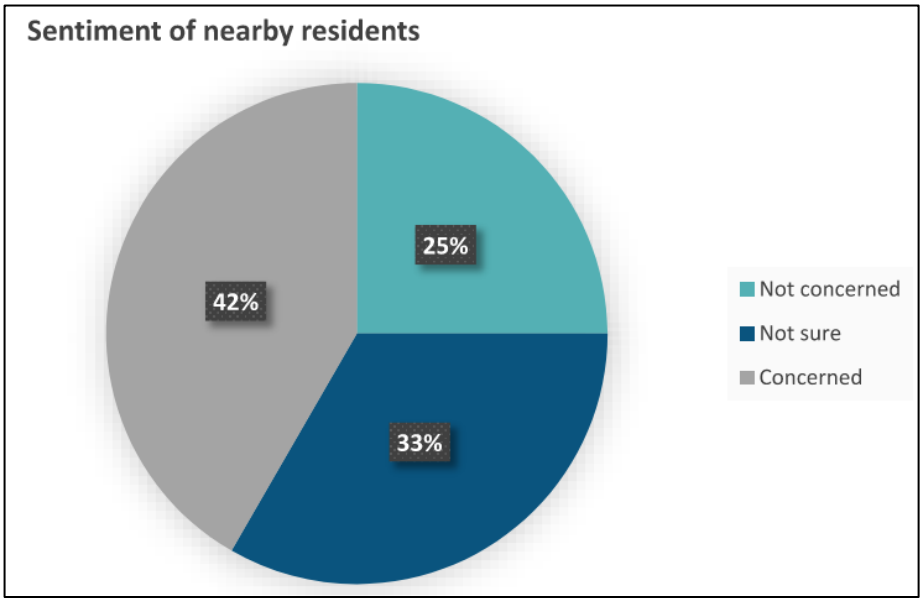


FIGURE 15 – SUMMARY OF RESIDENTS SENTIMENT TOWARDS PROJECT

Source: Equis

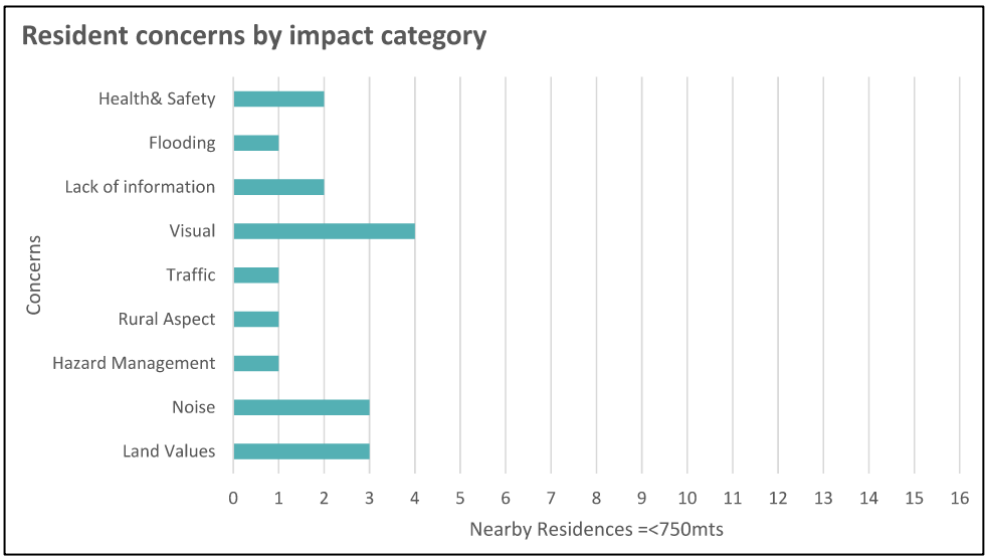


FIGURE 16 – SUMMARY OF CONCERNS RAISED BY STAKEHOLDERS

Source: Equis

The above feedback was received via all forms of engagement activities undertaken, however the community information session provided opportunity for members of the community to provide feedback directly to Equis staff and the project team.

The community information session was held between 3 and 7pm on 14 December 2022 at 191 Goonoo Goonoo Road, Tamworth. The session was attended by 28 people with the main concerns raised being:

- That the BESS will impact their land values
- Loss of agriculture
- Impact on housing, with locals fearing they will be priced out of the housing market that is already tight at a 0.5% vacancy rate.

- Visual impacts
- Noise
- Fire & hazard management.

Table 16 below provides an overview of the concerns raised and feedback received, and the measures that are proposed to be implemented to mitigate the concerns.

TABLE 16 – ENGAGEMENT FEEDBACK SUMMARY AND RESPONSE TABLE

CONCERN	COMMENTS	RESPONSE/MITIGATION
Health and Safety	Concern was raised with regard to health, including mental health and wellbeing of individuals directly and indirectly impacted by new BESS infrastructure. Residents felt that the impacts on their landscape, and visual and audible impacts as a direct result of the project, is affecting their mental and emotional health. Concern was also raised regarding the perception of additional risks that the BESS could cause to their health and safety in the event of a hazard of fire and other disasters, such as the increased possibility of pollution, chemical contamination, bushfires, and explosions caused by the BESS. One resident was concerned about the BESS's potential health impacts to his horses. Concerns were exacerbated by the worry that the hazards and flooding happening at the same time will limit the access to emergency services to respond to the hazard.	Equis are committed to mitigation of fire, pollution, explosion and other hazards by: • Adopting the recommendations for managing bushfire risk within the Bushfire Risk Assessment's (BRA) recommendations. • Establishing an asset protection zone and maintaining an Inner Protection Area as detailed in the NSW Rural Fire Service's document 'Standards for Asset Protection Zones' and Appendix 4 of Planning for Bush Fire Protection 2019. • Implementing a range of Plans including Management plans for: Risk, Emergency, Fire and Environment, and train all first responders that may use them. • Using safe and proven technologies that allow our BESS to operate safely and quickly shut down to mitigate fire hazards, such as a SCADA and a Battery Management System (**BMS**). Together, these will monitor for faults in real-time, including smoke and system temperatures. • Providing two steel water tanks with an approximate capacity of 100,000 litres in accordance with the guidelines. • Partnering with the NSW Rural Fire Service (as per our community enhancement fund) to train landholders as fire responders and provide them with necessary resources. This could provide landholders with agency should an emergency situation occur and may reduce the anxiety surrounding the possibility of hazards. • Equis will maintain consistent communication with nearby landholders to provide them with relevant technical information about the risk of hazards, or let them know when that information

		may be available if it is not at the time they seek it.
Flooding	Accessibility of emergency services (should the BESS experience a hazard) during times of flooding was raised as both a safety and accessibility concern, as local road conditions may be worsened by additional traffic and/or increased risk of flooding. In particular, residents raised specific concerns about Burgmanns Lane as it sits in an area that has been identified as being prone to flooding due to its proximity to the Peel River and Calala Creek.	The traffic impact assessment confirms Burgmanns Lane is not relied on for access. The Water Management Report (**WMR**) notes that the Peel River floodplain, the major determinant of flooding around Tamworth, lies north of the site. The WMR notes that the site sits outside of this floodplain, however the property that will house the Calala BESS site does overlap with the Calala Creek floodplain. According to the WMR, the Calala Creek flood extents for the 1% Annual Exceedance Probability and Probable Maximum Flood indicate that the project site will be unaffected by flooding. Further, the site will be raised by an earthworks pad, and hence is unlikely to be impacted by flooding, nor will this earthworks pad contribute to flood impact. To provide some assurances around this concern, Equis will work with emergency services to determine the options of an aerial emergency response in the event of flooding.
Property values	Concern was raised due to the perceived potential impact on property values in the local area. Residents expressed distress surrounding the potential loss of land value as a result of the projects impacts to amenity during both construction and operation. This was a particular concern for residents who live within 500m of the site, as some felt that the full use of their property would become compromised for future use. This impact was also raised as significant given the age of many elderly residents, who expressed that they 'don't have the lifespan to recoup' if their property became devalued.	Even though there is no direct evidence linking the presence of a BESS with devalued properties, it is noted that this perceived potential impact on property values in the local area can impact resident's mental and emotional health. Equis will continue to work closely with landholders to support them how they are best able to.
Lack of information	Concern was raised that the engagement process should include regular sharing of information. Residents wanted information about noise and distance of BESS in relation to residents homes. There were instances where this information was not available as technical reports on background noise monitoring and noise impact assessments were not completed yet. Not being able to provide this information resulted in two residents feeling that they were being ignored and feeling a perceived a lack of transparency from the project, resulting	Equis will aim to: • Inform residents when the technical information they seek will be available. • Minimise community unrest that may fester a sentiment of perceived lack of transparency and adequate communication, by maintaining consistent communication with nearby landholders about project changes and updates. This will be undertaken through a system of standardised updates when there are any new project updates.

	in feelings or worry, uncertainty, and mistrust.	
Visual impact	Whilst there is existing energy infrastructure in the immediate locality (numerous transmission towers and Transgrid's existing Tamworth substation), residents feel affronted by the perceived visual presence of the proposed BESS.	To reduce the visual impact of the project, the following mitigation measures recommended in the LCVIA will be implemented: • The establishment of perimeter landscaping buffers (along the northern and western boundaries) comprised of native plants to help the facility integrate with its surroundings and minimise any visual impact to the nearest dwellings. • Colour recommendations; and • The implementation of lighting design principles. In accordance with these measures, the LCVIA predicts that the project can avoid night sky impact, reduce the visibility and contrast of the project in the landscape, minimise the impact to the existing landscape character, retain the existing screening vegetation, and enhance the screening of the project.
Traffic	Concern was raised regarding the existing conditions of local roads around Calala identifying them as being in poor condition, leaving locals feeling vulnerable to daily accessibility hindered by traffic impacts. The Traffic Impact Assessment Report confirms that "The additional traffic generated during the construction period will generally be relatively minor compared to the existing daily traffic volumes". The report concludes that "it is not anticipated that the construction traffic volumes will result in significant adverse impact on the safety or function of the road network".	The mitigation strategies include: • Enforcing the Traffic Management Plan (**TMP**) • Providing advance notice of any planned construction works to all impacted stakeholders as per our communication plan. • Consultation with the Government transport agencies and Councils. • Maintaining working hours between 7am to 6.00pm, Monday to Friday, and 8am to 1pm, Saturday, and no work on Sunday or public holidays. • Secure work permits for any work outside of these times if required. • Displaying road signage and reduced speed limits if required. • Delivering effective and timely engagement with stakeholder and road users.
Conflict with rural aspect - impact to local character	Concern was raised regarding the proximity of the proposed infrastructure which will likely impact on residents and communities' sense of place. Residents felt that the rural lifestyle, quiet and tranquil atmosphere, and quality of life they experienced are core values to them. Residents made a note that the BESS should be placed away from current dwellings, so it does not conflict with the rural aspect of their properties	To mitigate this, the recommended mitigation measures in the LCVIA to reduce the visual impact of the project include: • Perimeter landscaping (along the northern and western boundaries). • Colour recommendations. • The implementation of lighting design principles. In accordance with these measures, the LCVIA predicts that the project can avoid

	and impact on the local character which they highly value. It was identified that the resident's perception is that the industrial nature of the BESS facility will contrast with the rural aspect of Calala.	night sky impact, reduce the visibility and contrast of the project in the landscape, minimise the impact to the existing landscape character, retain the existing screening vegetation, and enhance the screening of the project. The establishment of landscaping buffers comprised of native plants will help the facility integrate with its surroundings and minimise any visual impact to the nearest dwellings.
Noise	Concern was raised with regard to noise disruption to resident's amenity, resulting from both construction and operational noise. This is one of the primary concerns relating to the project. Residents are anxious how this would impact their daily lives. As a result of this impacted amenity, and their close proximity to the site, some landholders also felt that the project may have a resultant negative impact on their land values. One resident believed that their ability to use and enjoy their 5-acre property would be compromised as a result to the noise emanating from the BESS, particularly regarding their future use if they ever wanted to build a second dwelling. This concern about noise was also fuelled by a lack of available technical information and/or awareness about the reality of the sounds caused by the BESS.	The noise assessment adopts a conservative approach for both operation and construction. Operational noise level predictions at all relevant noise sensitive receivers have been conducted and will achieve full compliance with the relevant criteria. The Project will enforce the Site Noise Management Plan and ensure working hours, except where for practical reasons the construction activity is unavoidable (and thus communicated and approved by Council), are between: 7am to 6.00pm, Monday to Friday, and 8am to 1pm, Saturday. An out-of-hours works permit will be required outside of these times. In response to the NVIA and local's feedback, Equis have undertaken minor design development that introduces physical noise controls that demonstrate compliance with the evening and night project trigger levels. This is discussed in Section 6.3.1 of the NVIA. These design changes include perimeter noise barriers (in the form of a noise wall directly adjoining the BESS) to the north and west boundaries of the site and near-field barriers to the HV transformers. With the inclusion of suitable noise control measures, the NVIA concludes that the project achieves compliance with the evening and night project noise trigger level.
Agriculture	Concern was raised at the information session "that good quality agricultural land will be used for renewables". This sentiment was also reiterated during the Urbis SIA consultation, where some residents expressed concerns that the BESS was not consistent with the agriculture typical of the surrounding area. As outlined in the Land Use Conflict Risk Assessment and Agricultural Capability Statement, the use of the land is currently rural residential development; that is, people live on rural	Whilst the concern is acknowledged, the land is not currently used or suitable for intensive agricultural purposes. As identified, there are some hobby farming practices that occur, however the majority of land in the locality is used for rural residential purpose. The Land Use Conflict Risk Assessment prepared by Edge Land Planning has been prepared in accordance with the Department of Industry's Land Use Conflict Risk Assessment Guide and concludes that there is no land use conflict and that the site is considered suitable for the proposed BESS.

	lots, but use the land primarily for residential rather than agricultural purposes. Although some engage in 'hobby farming', most derive the principal source of their income from pursuits not carried out on the land. The total site area (currently used for agricultural and grazing purposes) is approximately 36 hectares. However, the footprint of the proposed facility will cover a total area of 8.9 hectares, being 24% of the land area. The Site has a Land and Soil Capability classification of Class 4 (moderate to severe limitations) and Class 5 (Severe limitations), with the BESS footprint located entirely in Class 4 land.	The remainder of the land not occupied by the BESS will be maximised for agricultural use through a potential partnership with Farrer Memorial Agricultural High School to enhance the school's agricultural program. Farrer embraces academic, sporting, and agricultural pursuits delivered in first-rate learning and participation facilities including two productive farms. Equis are currently exploring a partnership that allows the Farrer Memorial Agricultural High School to farm the agricultural lands that surround the Calala BESS (circa 29 acres), where the students can run sheep and other livestock. This may benefit over 600 students.
Social, economic and environmental benefits – jobs	Positive feedback about jobs creation and corresponding economic opportunities was received regarding the project. Youth skill development and supporting regional jobs and existing industries is important to locals, who recognise the benefits of the project to the state and the benefits that will flow to the region through the project's construction. A question in the survey prepared by Urbis included: *How significant do you anticipate the provision of jobs related to the project will be to the local community?* The average answer was 39 out of 50, being moderate to high.	Equis are committed to adopting a procurement process that includes a Local Jobs First Program. The project will create up to 170 jobs through construction and 7 during operation. To the extent possible, Equis will aim to employ local people and use local businesses in the construction supply chain.
Social, economic and environmental benefits – services	The workforce visiting the area during the construction phase will generate a positive economic benefit for local accommodation and service sectors, who have said that they would welcome the extra business. Accommodation providers have indicated that they have ample capacity.	No response/mitigation required.
Training	Feedback received during consultation/exhibition confirmed that the Farrer Agricultural High School and Carinya Primary School (two local Calala schools) would like to develop partnerships between the Calala BESS/ Equis to deliver enhanced learning pathways. In collaboration with local schools, other training providers and local suppliers, the Calala BESS could offer a training platform to skill workers required for the transition to renewables. This will help upskill local workers to	No response/mitigation required.

	transition into renewable energy industries. For example, the Farrer Memorial Agricultural High School highlighted the opportunity to build infrastructure that supports the school's energy and environmental sustainability, such as dams, solar panels, and BESS facilities, and introduce science and technology curriculum around energy.	
Training support for the NSW Rural Fire Service	The 2019-2020 Black Summer bushfires destroyed 186 homes and 27 business premises across southern NSW. The fire caused an estimated $56 million dollars in damage. Without the relentless work of the local RFS, these losses would have been much higher. With climate change forecasted to create increasing adverse events, areas like the Tamworth and Northern Rivers region remain at risk to extremities such as drought, flood and fires.	The project community enhancement fund will work closely with the NSW Rural Fire Service District Manager to support initiatives that train locals as a firefighting resource.

5.6 Community benefit initiatives

As discussed within the Social Impact Assessment prepared by Urbis, Equis are exploring various community benefit initiatives in the regions and the communities where the project is located and will continue to work with the community to design programs that foster economic and social resilience, provide value to the community, and deliver stronger, more equitable regional economies.

The strategies proposed as part of the community benefit initiatives are aimed at stimulating enterprise and building social capital and community capacity. The consultation and engagement process with peak community bodies identified some community initiatives which are listed in the table below from the Engagement Summary prepared by Equis.

TABLE 17 – COMMUNITY ENHANCEMENT OPPORTUNITIES

Source: Equis

RESPONDING TO REGIONAL AND STATE STRATEGIC OBJECTIVES										
Organisation	**Initiative ideas raised by the community:**	**Build resilient & diverse communities**	**Support education & learning**	**Promote active healthy communities**	**Celebrate culture, heritage & diversity**	**Prosperity & Innovation**	**Protect agricultural lands & livelihoods**	**Work with, and protect the environment**	**Enhance tourism & visitor opportunities**	**Regional connectivity**
Farrier Memorial Agricultural High School	A customised curriculum educational pathway programs providing learning opportunities for youth to train and develop skills in renewable energy technologies.		✓		✓	✓		✓		
	An Indigenous yarning circle for storytelling and connection – 12% of students		✓		✓					✓
	Build infrastructure that supports the school's energy and environmental sustainability, such as dams, solar panels and BESS.					✓		✓		
NSW Rural Fire Service	Collaborative fire and safety training programs with farming communities and landholders, so they	✓	✓				✓	✓		✓

	become a valuable resource contributing to the region's firefighting efforts.									
	Girls on Fire program, to enlist more women as volunteers in the NSW Rural Fire Service. This includes forums and training opportunities, where women come together, share, learn and contribute.	✓	✓				✓	✓		
	Funding towards building toilet amenities so women feel more supported to participate and provide service to the NSW Rural Fire Service.	✓								
	Indigenous arts program with the Bumbira arts group, to host local arts programs and create artwork for the newly built local command centre.		✓		✓					✓
TAMBUG (Mountain Bike Users)	Development of physical barriers on the side of the roads that provide safe barriers/sections for bike riders to commute safely in designated areas.	✓		✓					✓	✓
Tamworth Regional Council	Tamworth Regional Heritage Festival - The festival features over 30 events including open days, tours and displays throughout the Tamworth region. Museums open their doors for special behind the scenes tours		✓		✓				✓	✓
	Fiesta La Peel – the region's biggest multicultural event, with over 30 nationalities represented through a mix of cultural food stalls, demonstrations, and performances.	✓	✓	✓	✓				✓	✓
	Annual Sporting Club grant	✓	✓	✓						✓
Discretionary	Other funding such as traineeships & job support programs or determined by community.	✓	✓	✓	✓	✓	✓	✓	✓	✓

5.7 Ongoing engagement and consultation

The Engagement Summary prepared by Equis in Appendix C confirms engagement and consultation will continue with the stakeholders outlined in Table 18 throughout all stages of the project as required.

TABLE 18 – STAKEHOLDERS

STAKEHOLDER	ORGANISATION
Local Council	Tamworth Regional Council
State Minister	Hon. Kevin Anderson, MP
Federal Minister	Hon. Barnaby Joyce, MP
Planning and Environment	NSW Department of Planning and Environment
	NSW Environment Protection Authority
Natural Resource Management Groups	NRM Regions
	Local Land Services
	Tamworth Agricultural Institute
Emergency Services	NSW State Emergency Service
	NSW Rural Fire Service
Traditional Owners	Tamworth Local Aboriginal Land Council

Chamber of Commerce	Tamworth Change of Commerce
Media	Northern Daily Leader
	88.9 FM Tamworth
	2TM – FM92.9
	SBS Radio
Schools, TAFEs, Universities & other training providers	University of New England
	Farrer Memorial Agricultural High School
	Carinya Christian School
Utility Providers	Providers such as Energy Australia, Lumo Energy, Red Energy, Dodo, Origin Energy and Alinta Energy
	Distributors such as Endeavour Energy, Essential Energy and Ausgrid
Objectors	*[Not disclosed]*
Landowner	*[Not disclosed]*
Adjoining landowners	*[Not disclosed]*
Local Community Groups	Tamworth Family Support Services Social & community enterprises
Local Suppliers	TBA

In addition to the above, consultation will be undertaken with nearby and adjoining landowners as per the recommendations of the Social Impact Assessment. The SIA recommends that the project compile a 'Summary of Impacts' document and distribute it to nearby neighbours through a letter box drop, which could contain relevant technical information addressing the prime concerns raised through consultation. Equis have prepared Summary of Impacts document which will be issued to nearby and adjoining residents at the same time this application is submitted to DPE. The newsletter will provide a direct project specific link to the DPE's Major Projects website where the public can view all the EIS application documents and provide their feedback on the project during the public exhibition process.

6 Assessment and mitigation of impacts

6.1 Biodiversity

A Biodiversity Development Assessment Report (**BDAR**) was prepared by Biosis in support of this EIS in response to the SEARs requirements which state the following:

- ***Biodiversity*** *– including:*
    - *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), the Biodiversity Assessment Method (BAM) and documented in a Biodiversity Development Assessment Report (BDAR), unless BCS and DPIE determine the proposed development is not likely to have any significant impacts on biodiversity values;*
    - *the BDAR must document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the BAM; and*
    - *if an offset is required, details of the measures proposed to address the offset obligations.*

The BDAR is provided in Appendix H, and it addresses the requirements of the Biodiversity Assessment Method (**BAM**), NSW, the NSW Biodiversity Offset Scheme, the Biodiversity Conservation Act 2016 (**BC Act**), and other relevant legislation including the Environment Protection and Biodiversity Conservation Act 1999 (**EPBC Act**). The BDAR also recommends measures to minimise impacts where they are unavoidable.

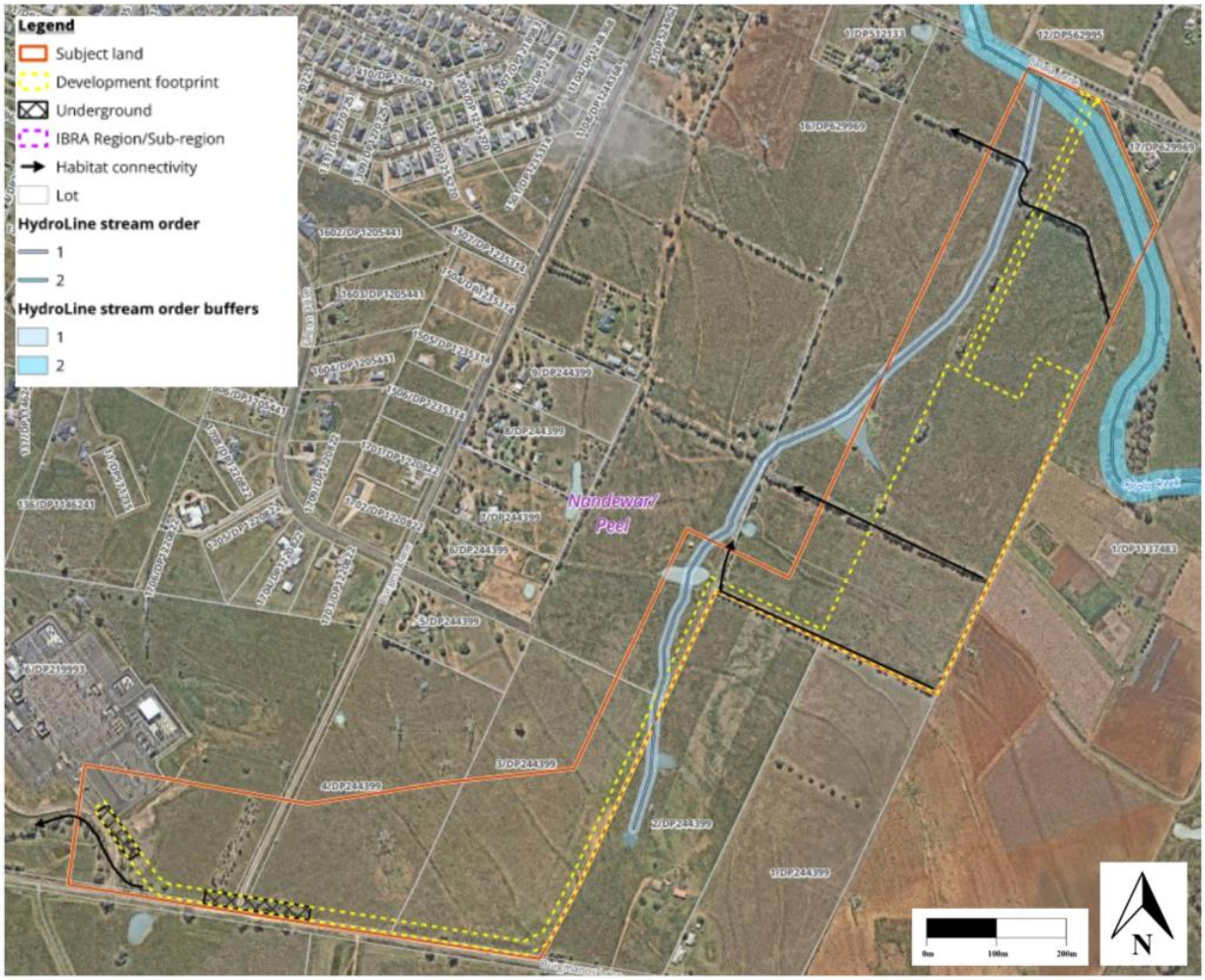


FIGURE 17 – SITE MAP

Source: Biosis

6.1.1 Existing environment

6.1.1.1 Native Vegetation

The study area's native vegetation, threatened ecological communities, and integrity were determined using the results of site investigations, recent studies undertaken at the study area, and Section 4 of the BAM.

FIGURE 18 – NATIVE VEGETATION COVER

Source: Biosis

Two plant community types (PCT) were recorded within the study area: PCT 84: River Oak – Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion, and PCT 599: Blakely's Red Gum - Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion.

Two threatened ecological communities (TEC) were identified on the study area, one listed under the BC Act and one listed under the EPBC Act as follows:

- **BC Act:** 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

- **EPBC Act:** White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

6.1.1.2 Ecosystem Credit Species

Table 19 includes a list of ecosystem credit species assumed to occur within the study area based on the occurrence of the PCTs, habitat constraints, native vegetation cover in the landscape and calculated patch sizes.

TABLE 19 – ECOSYSTEM CREDIT SPECIES (PREDICTED SPECIES) WITH POTENTIAL TO OCCUR

Source: Biosis

Common name	Species name
Black Falcon	*Falco subniger*
Black-breasted Buzzard	*Hamirostra melanosternon*

Common name	Species name
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*
Black-necked Stork	*Ephippiorhynchus asiaticus*
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*
Diamond Firetail	*Stagonopleura guttata*
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*
Flame Robin	*Petroica phoenicea*
Glossy Black-Cockatoo	*Calyptorhynchus lathami*
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*
Grey-headed Flying-fox	*Pteropus poliocephalus*
Hooded Robin (south-eastern form)	*Melanodryas cucullata cucullata*
Large Bent-winged Bat	*Miniopterus orianae oceanensis*
Little Lorikeet	*Glossopsitta pusilla*
Regent Honeyeater	*Anthochaera phrygia*
Scarlet Robin	*Petroica boodang*
Speckled Warbler	*Chthonicola sagittata*
Spotted-tailed Quoll	*Dasyurus maculatus*
Swift Parrot	*Lathamus discolor*
White-bellied Sea-Eagle	*Haliaeetus leucogaster*

6.1.1.3 Credit Species

Species credit species are threatened species for which vegetation surrogates and landscape features are not reliable indicators for predicting their occurrence in the study area. These candidate species are identified as species credit species in the Threatened Biodiversity Data Collection (**TBDC**). To ascertain their presence within the study area, either a targeted survey or an expert assessment is mandated. Alternatively, in the absence of such confirmatory methods, these species can be presumed to inhabit the study area.

Threatened Fauna

The fauna habitat assessment was conducted to ascertain the presence of microhabitats and essential habitat components that might be suitable for a range of fauna species within the study area. The assessment encompassed various ecological features including:

- **Habitat Trees**: The assessment revealed no presence of hollow-bearing trees or stick nests within the study area. Given that hollow formation is often related to tree age, the existing trees in the woodland of PCT 599 did not exhibit characteristics conducive to producing hollows.

- **Feed Tree Species**: With a limited diversity and low abundance of tree species, predominantly eucalypts, the study area is not considered to contain significant foraging resources for fauna such as the Koala, Eastern Pygmy-possum, and Squirrel Glider.

- **Caves and Rocky Overhangs**: The assessment found an absence of caves or rocky overhangs that might provide potential breeding habitat for threatened species of microbats, including the Large-eared Pied Bat and Large Bent-winged Bat.

- **Rocky Outcrops and Sandstone Crevices:** The absence of these features indicates a lack of suitable habitat for specific reptiles such as the Pink-tailed Legless Lizard and Border Thick-tailed Gecko.

- **Watercourses and Waterbodies:** The study area displayed no major or minor watercourses. Calala Creek is identified as highly ephemeral land that is little more than a depression to drain rainwater to the north. Three artificial waterbodies, also characterised as ephemeral, and have negligible fringing vegetation and are prone to contaminants related to surrounding land use, were not considered appropriate habitats for species credit amphibians.

- **Woody Debris and Leaf Litter**: Due to extensive historical clearing, the study area contains a negligible amount of woody debris and leaf litter, limiting habitat availability.

- **Human-Made Structures**: The presence of a single transmission line tower was recorded; however, it was not assessed as a notable habitat for any species credit fauna species.

Due to historical modifications and almost complete clearing of the study area, the habitat for species credit fauna is missing or degraded. This includes specific constraints or lack of essential elements like connectivity or foraging/breeding resources. As such, the candidate fauna species credit species do not require further assessment.

Threatened Flora

The habitats for threatened flora species within the subject land are assessed to be largely degraded because of historical modifications, clearing, and land management practices. The threatened flora habitat is considered to be spatially confined to PCT 599_DNG and PCT 599_Woodland and restricted to those species that are most likely to be present based on known distribution and habitat associations which can endure within paddock or disturbed environments.

Table 20 identifies the threatened flora species that are impacted by the project as well as the attributes that make up the threatened flora species polygons. The spatial distribution is identified in Figure 8 of the BDAR.

TABLE 20 – THREATENED SPECIES POLYGONS WITHIN THE STUDY AREA

Source: Biosis

Threatened species	Subject land (ha)	Development footprint (ha)	Unit of measure	Biodiversity risk weighting	Polygon attributes
Flora					
Bluegrass	9.36	1.08	Area	High	PCT 599_DNG (outside targeted survey area) and PCT 599_Woodland.
Finger Panic Grass	9.36	1.08	Area	High	PCT 599_DNG (outside targeted survey area) and PCT 599_Woodland.
Belson's Panic	9.36	1.08	Area	High	PCT 599_DNG (outside targeted survey area) and PCT 599_Woodland.
Hawkweed	9.36	1.08	Area	High	PCT 599_DNG (outside targeted survey area) and PCT 599_Woodland.
Austral Toadflax	9.36	1.08	Area	Moderate	PCT 599_DNG (outside targeted survey area) and PCT 599_Woodland.

6.1.2 Impacts

The impacts associated with the proposed development are discussed under the relevant subheadings below.

6.1.2.1 Direct Impacts

Direct impacts include vegetation clearing as a result of the BESS, transmission line, roads, and other physical works. The direct impacts include:

- Removal of 1.33 ha of 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 (BC Act) and White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (EPBC Act).
- Removal of 0.06 ha of native vegetation comprising PCT 84_DNG.
- Removal of 1.08 ha of habitat for Bluegrass, Finger Panic Grass, Belson's Panic, Hawkweed and Austral Toadflax that have been assumed present.

The above impacts will occur at the outset of the project and will be permanent. A summary of the PCTs and TECs impacted are summarised in Table 21, and the impact to the threatened flora species are summarised in Table 22.

TABLE 21 – SUMMARY OF DIRECT IMPACTS TO VEGETATION

Source: Biosis

Zone	PCT	TEC	Area within subject land (ha)	Area impacted (ha)	VI Score
1	84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	-	1.10	0.06	36.5
2	599: Blakely's Red Gum - Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion (DNG)	*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* (BC Act) *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* (EPBC Act)	12.09	1.30	33.2
3	599: Blakely's Red Gum - Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion (Woodland)	*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* (BC Act) *White Box-Yellow Box-Blakely's Red Gum Grassy*	0.99	0.03	63.8

Zone	PCT	TEC	Area within subject land (ha)	Area impacted (ha)	VI Score
		Woodland and Derived Native Grassland (EPBC Act)			

TABLE 22 – SUMMARY OF DIRECT IMPACTS SPECIES CREDIT HABITAT OR INDIVIDUALS

Source: Biosis

Species	Sensitivity	Area (ha)
Bluegrass ***Dichanthium setosum***	Moderate	1.08
Finger Panic Grass ***Digitaria porrecta***	High	1.08
Belson's Panic ***Homopholis belsonii***	High	1.08
Hawkweed ***Picris evae***	High	1.08
Austral Toadflax ***Thesium austral***	Moderate	1.08

6.1.2.2 Indirect Impacts

The indirect impacts arising from the BESS and associated works are addressed in detail in Table 23. The risk to nearby vegetation and habitats is generally considered to be very low. The risk is mitigated by containing construction within clearly defined boundaries and using trenchless construction methods in the PCT 599_Woodland, which has the highest degree of native vegetation and biodiversity values. Although indirect impacts from the BESS development such as noise, light, and dust spill may impact areas of native vegetation and high biodiversity values, significant impacts such as the inadvertent clearing of PCT 599_Woodland is considered to be unlikely.

6.1.2.3 Prescribed Impacts

The identification and assessment of prescribed biodiversity impacts are outlined and addressed in Table 24. It is noted that Category 1 land is required to be assessed for prescribed impacts under the BAM.

6.1.2.4 Uncertain Impacts

There are certain impacts that are classified as uncertain, primarily because they are challenging to quantify using GIS software and difficult to predict. These uncertain impacts often include indirect effects, discussed in Section 6.1.2.2 of this EIS, such as inadvertent damages to native vegetation near the development site, the potential introduction of pests, pathogens, and weeds, degradation of downstream habitats due to changes in water quality or hydrology, and risks associated with vehicle strikes.

6.1.2.5 Groundwater Dependent Ecosystems Impacts

The assessment of the potential impact on Groundwater Dependent Ecosystems (**GDEs**) within the subject land was conducted using the Australian Government's Bureau of Meteorology Groundwater Dependant Ecosystems Atlas. The study area is not identified as supporting GDEs associated with an aquifer. Moreover, the project does not propose the utilisation of groundwater, and measures for controlling pollution of surface water will be implemented to ensure the safeguarding of groundwater.

TABLE 23 – INDIRECT IMPACTS

Source: Biosis

Indirect impact	Impacted entities	Extent	Frequency	Duration	Project phase/ timing of impact	Likelihood and consequences
Inadvertent impacts on adjacent habitat or vegetation	• PCT 84 • PCT 599 • Bluegrass habitat • Finger Panic Grass habitat • Belson's Panic habitat • Hawkweed habitat • Austral Toadflax habitat • Habitat for all ecosystem credit species	Unpredictable	Unknown	Possibly long-term	Construction	It is anticipated that there is sufficient flexibility within the transmission line corridor that impacts to tree roots can be avoided. Above ground impacts to this vegetation during construction can be prevented or minimised through appropriate exclusion fencing, implementation of a Construction Environmental Management Plan (CEMP) detailing best practice environmental protection measures, strict water quality practices and stormwater controls, and by ensuring any lighting is directed towards the development footprint, rather than towards the adjacent retained habitats.
Reduced viability of adjacent habitat due to edge effects	• PCT 84 • PCT 599 • Bluegrass habitat • Finger Panic Grass habitat • Belson's Panic habitat • Hawkweed habitat • Austral Toadflax habitat • Habitat for all ecosystem credit species	Unpredictable	Unknown	Possibly long-term	Construction	Adjacent habitats are currently subject to a high degree of edge effects due to prior clearing and surrounding existing residential and agricultural land use. Little native vegetation (1.37 ha) is to be removed from the subject land and an increase to edge effects is not expected to occur to the remnant vegetation surrounding the subject land, as a result of the proposed development.
Reduced viability of adjacent habitat due to noise, dust or light spill	• PCT 84 • PCT 599 • Bluegrass habitat • Finger Panic Grass habitat • Belson's Panic habitat	Unpredictable	Unknown	Possibly long-term	Construction and operation	It is predicted that the adjacent habitat will be impacted in a small way by noise, dust and light spill, during construction and operation of the future development of the subject land. However, this will be managed via best practices outlined in a CEMP. The subject land also already occurs as a residential area, and light and noise pollution is most likely

Indirect impact	Impacted entities	Extent	Frequency	Duration	Project phase/ timing of impact	Likelihood and consequences
	• Hawkweed habitat • Austral Toadflax habitat • Habitat for all ecosystem credit species					moderate. This will likely not substantially increase due to the proposed future development.
Transport of weeds and pathogens from the site to adjacent vegetation	• PCT 84 • PCT 599 • Bluegrass habitat • Finger Panic Grass habitat • Belson's Panic habitat • Hawkweed habitat • Austral Toadflax habitat • Habitat for all ecosystem credit species	Unpredictable	Unknown	Possibly long-term	Construction and operation	Weeds occurring within the subject land are common with those occurring within adjacent vegetation to be retained, particularly the road corridor of Burgess Lane. Increased transport of pathogens and weeds is unlikely to occur but will be managed by biosecurity measures outlined in the CEMP.
Increased risk of starvation, exposure and loss of shade or shelter	• PCT 599_Woodland • Habitat for all ecosystem credit species	One tree within PCT 599_Woodland	Unknown	Possibly long-term	Construction and operation	Removal of woody vegetation on Category 1 land is restricted to one small White Box within PCT 599_Woodland. This tree is considered to represent habitat, albeit negligible for all ecosystem credit species, however, its removal will not result in an increased risk of starvation, exposure and loss of shade or shelter to native species due to the small total area of vegetation being removed, which is a very small proportion of commensurate habitats available in the assessment area.
Loss of breeding habitats	Nil	Nil	Nil	Nil	Nil	No specialist breeding habitat will be impacted by the Project.
Trampling of threatened flora species	Nil	Unknown	Unknown	Possibly long-term	Construction and operation	Although Bluegrass, Finger Panic Grass, Hawkweed, Belson's Panic and Austral Toadflax have been assumed present, no threatened flora species are considered likely to occur within the subject land, and thus trampling of threatened flora

Indirect impact	Impacted entities	Extent	Frequency	Duration	Project phase/ timing of impact	Likelihood and consequences
						species outside of the development footprint is unlikely.
Inhibition of nitrogen fixation and increased soil salinity	Nil	Nil	Nil	Nil	Nil	Any future excavations or soil disturbance resulting from the Project will be largely restricted to areas having undergone significant previous disturbance. As such it is not considered likely that the future development of the subject land will result in substantial changes to the level of nitrogen fixation or soil salinity within the subject land or surrounds.
Fertiliser drift	Nil	Nil	Nil	Nil	Nil	The Project does not include the use of fertilisers, therefore there is no potential for this impact to occur.
Rubbish dumping	Nil	Nil	Nil	Nil	Nil	Potential for this impact to occur is considered negligible. Appropriate measure for the management of construction related rubbish will be detailed in the CEMP.
Wood collection	Nil	Nil	Nil	Nil	Nil	Potential for this direct impact to occur is considered negligible.
Removal and disturbance of rocks, including bush rock	Nil	Nil	Nil	Nil	Nil	The subject land does not support bush rock, therefore there is no potential for this indirect impact to occur.
Increase in predators	Nil	Nil	Nil	Nil	Nil	There is no potential for the Project to result in an increase in predators.
Increase in pest animal populations	Nil	Nil	Nil	Nil	Nil	Potential for this indirect impact to occur is considered negligible. The Project occurs in an urbanised industrial area with pest animals such as Rats *Rattus rattus* and European Rabbit *Oryctolagus cuniculus* likely to be already present. Rats do inhabit the built environment, including structures, however, an increase in Rat abundance is unlikely to occur. Waste and pest management will be in place for the life of the Project.
Changed fire regimes	Nil	Nil	Nil	Nil	Nil	Potential for this indirect impact to occur is considered negligible, and the requirements for legislated bushfire hazard reduction and asset

Indirect impact	Impacted entities	Extent	Frequency	Duration	Project phase/ timing of impact	Likelihood and consequences
						protection will be implemented during construction and operation of the Project.
Disturbance to specialist breeding and foraging habitat, e.g. Beach nesting for shorebirds	Nil	Nil	Nil	Nil	Nil	The subject land does not contain any areas of mapped Important Habitat.
Fragmentation of movement corridors	Nil	Nil	Nil	Nil	Nil	As discussed in Section 2.1.5, the subject land does not contain, nor is part of, any noteworthy movement corridors. The vast majority of woody vegetation.1.5 within PCT 599_Woodland will be avoided to maintain the 'stepping stone' connectivity present. Furthermore, although the BESS will be fenced, the BESS is situated such that passage of ground dwelling fauna will still be possible to the east and west of the BESS.

TABLE 24 – IDENTIFICATION OF PRESCRIBED IMPACTS

Source: Biosis

Prescribed impact	Description of relevant habitat features associated with prescribed impacts	Threatened species likely to utilise habitat features associated with prescribed impact	Importance of habitat feature to impacted species
Karst, caves, crevices, cliffs, rocks and other geological features of significance	The subject land does not contain any karst, caves, crevices, cliffs, rocks and other geological features of significance.	-	-
Occurrences of human-made structures and non-native vegetation	The subject land contains one human-made structure, a transmission line tower, which will not be impacted by the Project. The subject land does contain non-native vegetation (primarily cleared areas and landscaping/visual amenity planting).	Non-native vegetation is not in sufficient quantities, nor contains a particular resource to be considered habitat for threatened species.	-
Corridors or other areas of connectivity linking habitat for threatened entities	As discussed in Section 2.1.5, the subject land does not contain, nor is part of, any noteworthy movement corridors that link habitat for threatened species. PCT 599_Woodland and the planted rows or Eucalypts deemed Category 1 land could be said to be part of small scale local connectivity in a 'stepping stone fashion, however, removal of much of PCT 599_Woodland is not proposed and similarly not all planted rows will be impacted. As such, the Projects impact on the current level of connectivity is considered negligible.	Ecosystem credit species predicted to occur.	The diffuse habitat connectivity that intersects the subject land is not considered to be important to any threatened species. Furthermore, any that may use the area are likely to be highly mobile and traverse cleared landscapes commonly.
Water bodies or any hydrological processes that sustain threatened entities	Three waterbodies (artificial dams) are present within the subject land. Calala Creek is also present, but is highly modified and ephemeral. The drainage patterns of surface water across the subject land are to the north-west towards Calala Creek. However, graded banks may redirect water into artificial waterbodies- within and surrounding the subject land. Overall, these processes can be said to be contributing factors to sustaining the native vegetation and habitats present.	• Ecosystem credit species predicted to occur. • Box Gum Woodland • Bluegrass (assumed present) • Finger Panic Grass (assumed present) • Belson's Panic (assumed present) • Hawkweed (assumed present) • Austral Toadflax (assumed present) • Habitat for all ecosystem credit species	The present water quality and hydrological process contribute to sustaining the native vegetation recorded within the subject land, including Box Gum Woodland. The areas of native vegetation, in turn, may contribute to the persistence of the ecosystem credit species predicted to occur and those threatened flora assumed to be present. The development footprint, primarily of the BESS, will directly impact two dams, and others indirectly by redirecting water that will otherwise flow into said dams. However, these dams cannot be said to be important

Prescribed impact	Description of relevant habitat features associated with prescribed impacts	Threatened species likely to utilise habitat features associated with prescribed impact	Importance of habitat feature to impacted species
			or significant habitats for any of the threatened entities recorded or assumed present within the subject land at the bioregional scale. Other impacts to hydrology are generally considered benign as: • The transmission line will be underground and is not expected to impact groundwater directly. • Pollution (erosion and sediment) control measures will be in place during construction and operation for surface water, which should afford groundwater protection. • Construction of the BESS will introduce an impermeable surface which may increase, albeit minimally, surface water flow towards Calala Creek. Operational phase run-off will be managed using sediment traps and a sediment basin and overflow swale. These measures will further filter sediment from run-off before it enters the receiving environment and drainage patterns that direct water towards Calala Creek. • Where the access road intersects Calala Creek, a culvert will be constructed such that no change to the hydrology of Calala Creek is anticipated.
Where the proposed development may result in vehicle strike on threatened fauna or on animals that are part of a threatened ecological community	The subject land is dissected and surround by roadways that pose a potential vehicle strike risk to resident fauna. The Project is certain to result in increased vehicle traffic during the construction phase of the Project and to a far less extent, the operational phase of the BESS. This increased vehicle traffic has the potential to impact upon native fauna species that are active during the day, and generally with a higher	• Construction hours are limited to the day time, so possible vehicle strike of nocturnal fauna is not anticipated. • Commonly occurring fauna, including birds and macropods.	Non-threatened, ground dwelling fauna known to inhabit the general area, particularly macropods such as Eastern Grey Kangaroo *Macropus giganteus*, are notoriously prone to vehicle strike. Vehicle strike of macropods is likely to be an impact already in place, which may be exacerbated during construction.

Prescribed impact	Description of relevant habitat features associated with prescribed impacts	Threatened species likely to utilise habitat features associated with prescribed impact	Importance of habitat feature to impacted species
	potential for impact in areas where refuge/forage habitat exists immediately adjacent to areas where vehicle movements will occur.		

6.1.3 Impacts Requiring Offset

The assessor must determine an offset for the impacts of proposals on PCTs in accordance with section 9.2.1 of the BAM if the vegetation integrity score is:

- ≥15, where the PCT is representative of an ETEC EC or a CEEC.
- ≥17, where the PCT is associated with threatened species habitat (as represented by ecosystem credits) or represents a vulnerable ecological community.
- ≥20, where the PCT does not represent a TEC and is not associated with threatened species habitat.

In this instance, offsets are required for all PCTs impacted in the study area. The credit requirements for the relevant PCTs are specified in Table 25.

TABLE 25 – OFFSETS REQUIRED (ECOSYSTEM CREDITS)

Source: Biosis

Vegetation zone	Area (ha)	Impact	VI score	Offset required	TEC	HBTs	Credit requirement
PCT 84_DNG	0.06	Clearance	36.5	Yes	No	No	1
PCT 599_DNG	1.30	Clearance	33.2	Yes	Yes	No	27
PCT 599_Woodland	0.03	Clearance	63.8	Yes	Yes	No	1

The assessor must determine an offset for the impacts of proposals on PCTs in accordance with section 9.2.2 of the BAM if the proposal impacts the habitat of threatened species that require species credits. The credit requirements for the relevant PCTs are specified in Table 25.

TABLE 26 – OFFSETS REQUIRED (SPECIES CREDITS)

Source: Biosis

Species	Vegetation zone	Habitat condition (vegetation integrity score) loss	Area (ha)	Biodiversity risk weighting	Credit requirement
Bluegrass ***Dichanthium setosum***	599_DNG 599_Woodland	33.2 63.8	1.05 0.03	2	18
Finger Panic Grass ***Digitaria porrecta***	599_DNG 599_Woodland	33.2 63.8	1.05 0.03	2	18
Belson's Panic ***Homopholis belsonii***	599_DNG 599_Woodland	33.2 63.8	1.05 0.03	2	18
Hawkweed ***Picris evae***	599_DNG 599_Woodland	33.2 63.8	1.05 0.03	2	18
Austral Toadflax ***Thesium australe***	599_DNG 599_Woodland	33.2 63.8	1.05 0.03	1.5	14

All above ground impacts on land not mapped Category 1 require offset. Following the assessment, it is determined that the 28.1ha of Category 1 land in the study area does not require assessment in accordance with the BAM.

6.1.4 Mitigation

The identification of measures to mitigate or manage impacts has been undertaken in accordance with the BAM. The Construction Environmental Management Plan (CEMP) will involve an adaptive management component. The CEMP will ensure that it is accounts for new and relevant data that may become known throughout the ongoing assessment and monitoring of the native vegetation and biodiversity values. This approach allows for flexibility to accommodate changing dynamics, feedback, and identifiable results. The CEMP must include measures to monitor predicted and uncertain impacts to allow for effective and prompt responses. Moreover, the bulk of the development footprint is situated in Category 1 land as shown in Figure 19, thereby mitigating environmental impact. Impacts are also avoided to Box-gum Woodland Critically Endangered Ecological Community as much as possible through implementation of sensitive construction techniques such as tunnelling beneath trees. Further details regarding mitigation measures are provided in Table 27.

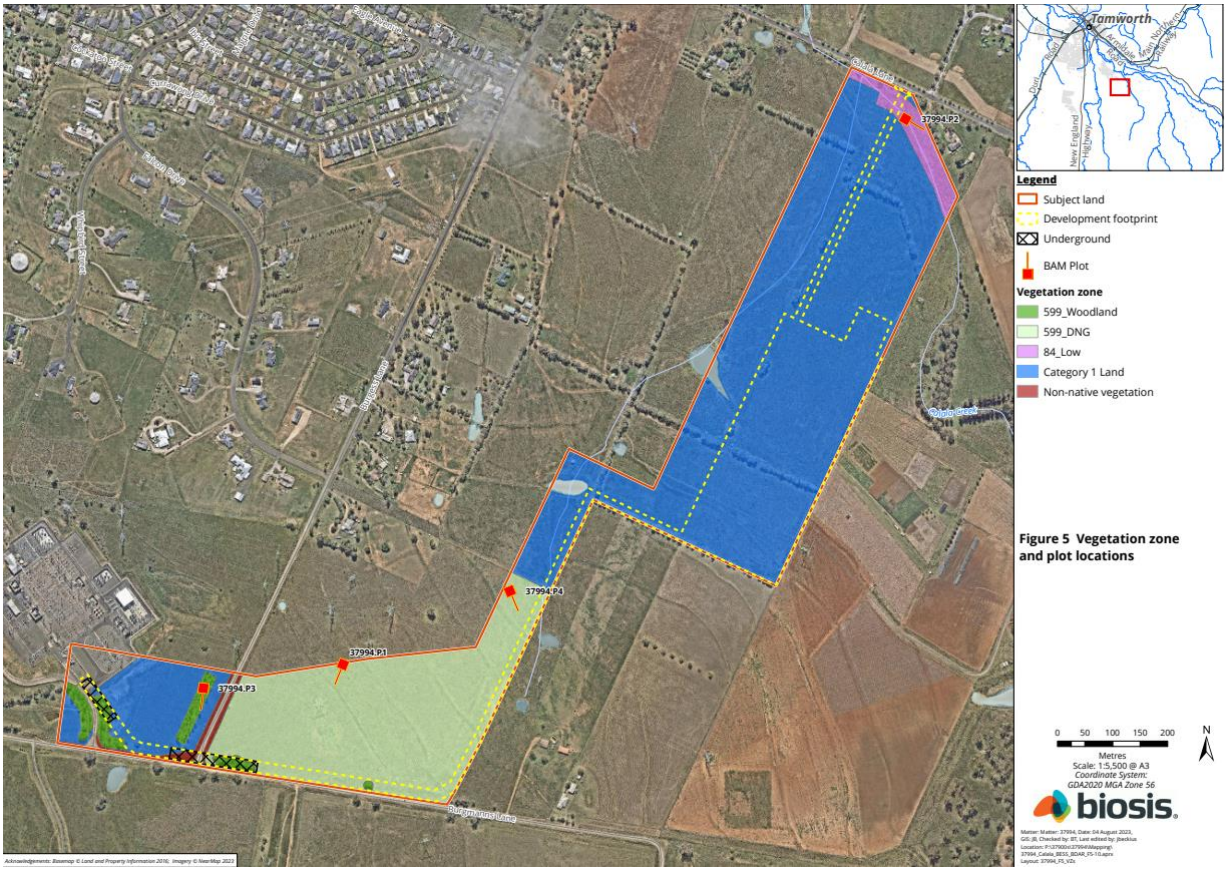


FIGURE 19 – VEGETATION ZONE AND PLOT LOCATIONS

Source: Biosis

TABLE 27 – MEASURES TO MITIGATE AND MANAGE IMPACTS

Source: Biosis

Measures to mitigate and manage impacts	Action	Outcome	Timing	Responsibility
Displacement of resident fauna	• Prescriptions for mitigation of potential impacts of construction activities on retained native vegetation and habitat should be addressed in a site-specific CEMP. • Pre-clearing surveys, including nocturnal surveys for amphibians, are to be undertaken. Resident fauna are to be relocated to areas of suitable habitat outside the development footprint. • All open trenches should be inspected prior to back filling to ensure no animals are present.	No direct impact to resident fauna during vegetation removal.	Up to 24 hours prior to vegetation removal.	Construction contractor.
Indirect impacts on native vegetation and habitat	• Prescriptions for mitigation of potential impacts of construction activities on retained native vegetation and habitat should be addressed in a site-specific CEMP. • Ensure all work areas and access routes are clearly delineated and sign-posted from the outset of the Project construction phase. • Implementation of hygiene protocols for plant and equipment entering and exiting the construction site. • Preparation of a Stormwater Management Plan (SWMP) and Erosion Sediment Control Plan (ESCP) in accordance with the Blue Book (DECC 2008). • No discharge of wastewater to the receiving environment. • Standard stormwater management features (including sediment detention) will be incorporated into the design of the Project to meet stormwater quality management requirements. • Rehabilitation of disturbed areas along the transmission line corridor with groundcover species characteristic of Box Gum Woodland.	No impacts to neighbouring vegetation and habitat including the aquatic environment.	Construction and Operation	Construction contractor.
Mitigating prescribed biodiversity impacts	• Demarcation of the limit of clearing prior to vegetation removal.	No impacts to neighbouring vegetation and habitat	Construction and operation	Construction contractor.

Measures to mitigate and manage impacts	Action	Outcome	Timing	Responsibility
	• Preparation of a SWMP and ESCP in accordance with the Blue Book (DECC 2008). • No discharge of wastewater to the receiving environment. • Standard stormwater management features (including sediment detention) will be incorporated into the design of the Project to meet stormwater quality management requirements	including the aquatic environment.		
Transport of weeds and pathogens to/from the site to/from adjacent vegetation	• A biosecurity management plan prepared as part of the Project's CEMP is recommended and will prevent the spread of weeds and pathogens, and other biosecurity items into or out of the impact area upon implementation.	Implementation of the detailed mitigation measures will ensure residual impact are considered of a low likelihood and severity.	Construction	Construction contractor.

6.2 Aboriginal Heritage

An Aboriginal Cultural Heritage Assessment (**ACHA**) was prepared by Biosis in support of the EIS (refer to Appendix I) in response to the SEARS requirements which state the following:

- ***Heritage*** *- including:*
    - *an assessment of the impact to Aboriginal cultural heritage items (cultural and archaeological) 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), including results of archaeological test excavations (if required);*
    - *evidence of consultation with Aboriginal communities in determining and assessing impacts, developing options and selecting options and mitigation measures (including the final proposed measures), having regard to the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010); and*
    - *assess the impact to historic heritage having regard to the NSW Heritage Manual.*

The ACHA addresses the final point of the SEARs requirement above and details the investigation, consultation and assessment of Aboriginal cultural heritage undertaken for the study area. It was prepared in accordance with section 2.3 of the *Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW*, the consultation requirements and the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW*.

The ACHA study area consists of parts of several allotments as follows:

- Lot 17 DP 629969
- Lot 16 DP 629969
- Lot 3 DP 244399
- Lot 4 DP 244399
- Lot 6 DP 219993

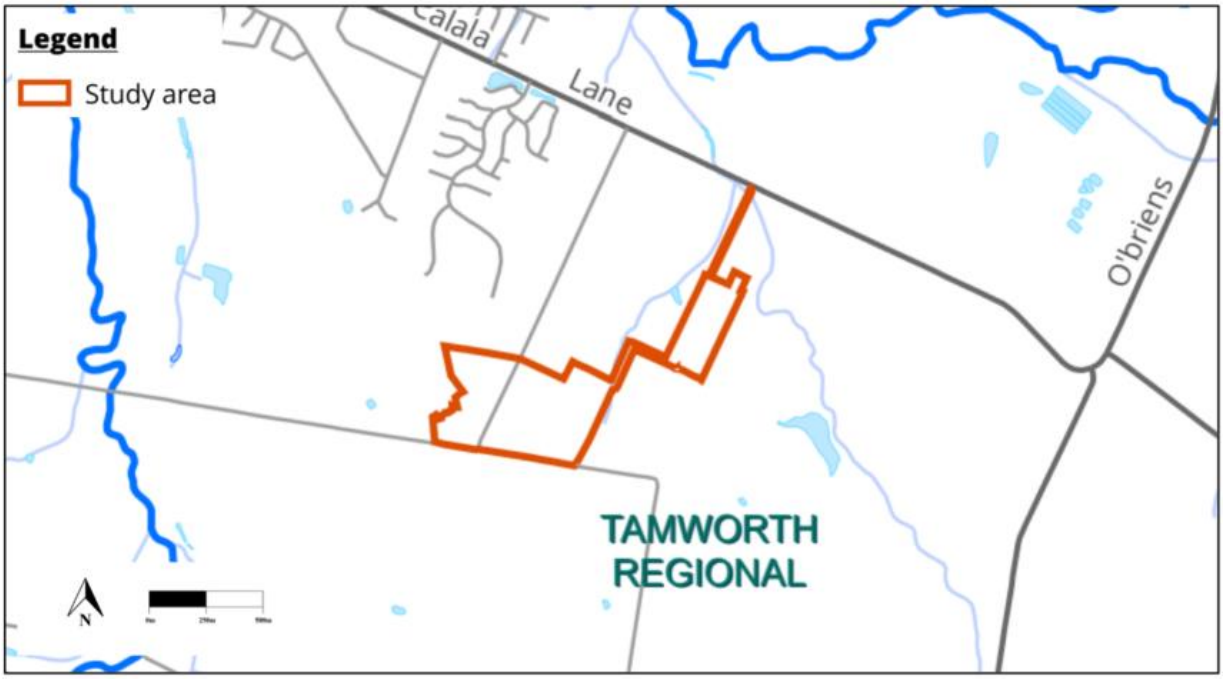


FIGURE 20 – LOCATION OF THE STUDY AREA

Source: Biosis

6.2.1 Existing environment

6.2.1.1 Topography, Geology, and Hydrology

Section 2.1 of the ACHA provides details regarding the topography, geology, and hydrology of the study area. The ACHA states that the topography of the study area consists of extensive rolling to undulating hills, radiating from the northeastern corner to the south-western corner, and that part of the study area broadly slopes towards the south-west (within part of Lot 6 DP 219993).

The study area is identified as containing two geological units: the Mandowa Mudstones (within the Devonian unit) and Noumea beds. In relation to hydrology, the study area contains to two creek lines:

- Calala Creek, a second order non-perennial watercourse located in the northern portion of the site, and
- a first order, non-perennial tributary of Calala Creek, located in the central portion of the site.

A large dam that is fed by the tributary of Calala Creek is located directly adjacent to the north-western corner of the study area. Moreover, Peel River and Goonoo Creek are both seventh order perennial watercourses located 1.1km north and 1.2km west respectively.

6.2.1.2 Soil Landscapes

Section 2.2 provides details regarding the soil landscapes of the study area. There are three soils landscapes contained in the study area, as follows:

- Duri
- Warral Station
- Fulwoods Hill

The Duri soil landscape consists of extensive rolling to undulating hills and low hills, being identified as an “extremely complex landscape due to underlying lithology”. Soils in this landscape are typically

moderately deep, moderately well-drained red and brown chromosols, while the soils along drainage lines and sodic bedrock are deep, imperfectly drained red clays and deep to very deep, imperfectly drained non-calcic brown soils. The soil in this landscape contains potential for deep soil deposits to preserve in-situ archaeological deposits, and the ACHA specifies that an archaeological assessment and subsequent testing of soils conducted by Everick Heritage within the Duri landscape identified that the culturally sterile clay layer is present between 100mm-200mm and that the surface soils do not have the ability to retain in-situ artefacts, especially where soils have been disrupted from tilling and pasture improvement.

The Warral Station soil landscape is a transferral landscape located on drainage plains, alluvial plains and fans. The landscape contains a “virtually random” distribution of diverse soils, but individual soil types are typically extensively grouped with some variation. The soil types in this landscape range from very deep, moderately well-drained loam to clay to very deep, poorly drained clays and very deep, imperfectly drained clay. This landscape is prone to erosion in areas of cropping or grazing.

The Fullwoods Hill soil landscape is identified as an “erosional landscape” located on rocky crests and steep side slopes of hills and low hills. This soil landscape is identified as a similar, albeit “steeper and rockier” version of the Duri soil landscape. Sheet erosion and shallow soils are common features of this landscape.

6.2.1.3 Climate and Rainfall

Section 2.3 of the ACHA provides information regarding the existing climate of the study area and relies on data sourced from the Tamworth Airport AWS weather station (Station No. 055325) located approximately 14.5km to the north-west of the study area.

The study area has a temperate climate with mean maximum high temperatures of 33 degrees and mean minimum temperatures of 16.5 degrees with seasonal high average rainfalls, providing a high likelihood that the study area would have contained seasonal resources and water sources. This favourable environment would suggest that the presence of Aboriginal sites in the surrounding area is likely.

6.2.1.4 Landscape Resources

Section 2.4 of the ACHA provides information regarding the landscape resources that may have been used by Aboriginal people that are available in the study area for a variety of purposes including tools, personal adornment, and shelter. The ACHA includes a list of native flora and fauna species supported by the Duri, Warral Staton, and Fullwoods Hill soil landscapes. Stone tool resources with the Tamworth area include a green-grey stone used for axes, and the Peel and Cockburn rivers were used to source raw materials including pebbles, cobbles of chert, cherty argillite, andesitic greywacke, quartz, hornfels and basalt. The rivers also provide smaller amount of chalcedony and petrified wood. Additionally, animal products such as brush-tailed possum fur and kangaroo teeth were used for clothing and decorative purposes.

6.2.1.5 European Land Use History

Section 2.5 of the ACHA details the historic European use of the land in the study area. The study area was used for agricultural grazing in the 19th century and likely continued into the 20th century. Historical aerial imagery from 1976 shows that the land within the study area was subject to extensive vegetation clearing and terracing to facilitate the use of land for paddocks. The historical imagery dated 1989 provides evidence of increased development in the area. For example, a residential development containing two structures is located to the east of the study. Aerial imagery of the subject area in 1989 shows evidence of earthworks and potential soil excavation, however no structures are shown to have been erected. Current aerial imagery shows that the study area is impacted by heavy ploughing and excavation of soils on the southern portion of the site. Two sheds are present in the central part of the study area and a dirt track is located on the northern portion of the study area.

6.2.1.6 Aboriginal heritage located in the study area

The AHIMS states that there are 97 Aboriginal archaeological sites within an 8.5km radius around the study area. However, no Aboriginal archaeological sites are recorded within the study area.

6.2.1.7 Interpretation of past Aboriginal land use

The surveys and research undertaken as part of the ACHA indicate that the study area contains low archaeological potential because of the significant disruption of soil due to agricultural purposes, landform modification, and vehicle tracks that impact the "intactness of any potential subsurface Aboriginal deposits".

6.2.1.8 Aboriginal community consultation

Aboriginal community consultation was undertaken in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*. A total of seven aboriginal stakeholder organisations were notified of the proposal, including Tamworth Local Aboriginal Land Council, Didge Nhunawal Clan, AT Gomilaroi Cultural Heritage Services, and RAW Cultural Healing. Likewise, a list of known Aboriginal stakeholders in the Tamworth region was provided by Heritage NSW. Public notice of the proposed development was published in the Northern Daily Leader (28 September 2022). A total of twelve registered Aboriginal parties were included in the consultation. On 3 November 2022, Biosis provided registered Aboriginal parties with details of the proposed development works and the project methodology. A total of four comments were received during the third stage of consultation relating to "gathering information about cultural significance".

6.2.2 Impacts

6.2.2.1 Statement of significance

The aboriginal heritage significance of the study area was assessed in accordance with the criteria set out in the *Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW*, the Burra Charter, and the *Guide to Investigating and Reporting on Aboriginal Heritage*.

The survey did not reveal any aboriginal sites or objects. Consultation with the Aboriginal community revealed that the study area has high cultural significance. However, the background research and survey confirmed that the study area has been heavily disturbed by previous and current land uses. The ACHA concludes that there is "no archaeological significance within the study area".

6.2.2.2 Physical Impacts

The study area does not contain any aboriginal sites nor objects. Because of disturbances observed in the area in conjunction with a landform that predictive modelling and survey has suggested is not likely to contain evidence of Aboriginal occupation, the study area is not anticipated to have any physical impacts on Aboriginal sites or objects. Section 6.1 of the ACHA states that the "proposed works will therefore not impact on any Aboriginal heritage values".

6.2.2.3 Ecologically Sustainable Development

Section 6.2 of the AHIMS indicates that ecologically sustainable development (**ESD**) requires the consideration of economic and environmental factors (including cultural heritage) in decision-making processes. The AHIMS identified a number of key sites, landforms, and landscapes in the region that are significant to local Aboriginal groups. As such, the AHIMS has furthered the knowledge of Aboriginal history and archaeology in the area and contributes to ESD.

6.2.3 Mitigation

6.2.3.1 Management and Mitigation Measures

Section 6.3 of the ACHA advises that avoidance of impact to archaeological and cultural heritage sites through the design of the development is the primary mitigation strategy and should be implemented wherever possible. The ACHA included an archaeological survey and Aboriginal community consultation to identify the potential presence of Aboriginal sites, archaeological, and cultural objects so that appropriate mitigation and management measures could be undertaken. However, the presence of Aboriginal sites was not identified, and the study area was assessed with a low potential due to high levels of soil disturbance. The mitigation measures to be implemented are identified as follows:

- **Heritage Induction**: An 'unexpected find procedure' should be implemented and cover:
    - Relevant legislation
    - Location of identified Aboriginal heritage sites, areas of archaeological potential, and areas of archaeological sensitivity
    - Basic identification skills for Aboriginal and non-Aboriginal artefacts and human remains
    - Procedure to follow in the event of an unexpected heritage item find during construction works
    - Procedure to follow in the event of discovery of human remains during construction works
    - Penalties and non-compliance
- **Consultation**: A copy of the ACHA is to be provided to the registered Aboriginal parties. Furthermore, the proponent is to continue to inform the registered Aboriginal parties about the management of Aboriginal cultural heritage sites within the study area throughout the life of the project.

6.3 European Heritage

A Historical Archaeological Impact Statement (**HAIS**) has been prepared by Biosis and is attached at Attachment J. The HAIS has been prepared to meet the requirements of the SEARs issued for the project which states the following:

- ***Heritage*** *– including:*
    - *an assessment of the impact to Aboriginal cultural heritage items (cultural and archaeological) 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), including results of archaeological test excavations (if required);*
    - *evidence of consultation with Aboriginal communities in determining and assessing impacts, developing options and selecting options and mitigation measures (including the final proposed measures), having regard to the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010); and*
    - *assess the impact to historic heritage having regard to the NSW Heritage Manual.*

The HAIS report addresses the final point of the SEARs requirement above and identifies and assesses any potential impacts to historic heritage. The report is informed by desktop investigation and site survey. Key points from the report are outlined below.

6.3.1 Heritage context

This section of the EIS identifies the study area, provides a chronology of the development of the study area, and describes the existing environment with regard to the topography, Aboriginal history and European settlement. The study area for the purposes of the HAIS is identified in Figure 21 below.

FIGURE 21 – LOCATION OF THE STUDY AREA

Source: Biosis

The study area is located across several lots, is approximately 2 kilometres south-east of Calala, and approximately 6 kilometres south-east of the Tamworth CBD. The study area includes the total development footprint which is approximately 42 hectares and covers the BESS footprint, access road, and transmission cable alignment and additional areas outside of the alignment which were included for the purposes of providing flexibility in the event of location changes.

The HAIS includes consideration of the historical development of Tamworth which is broken down as follows:

- 1797-1824 – Exploration
- 1824-1909 – Pastoral development

The subject site has largely been occupied by pastoral land uses. An aerial image from 1976 shows the study area has been subject to extensive vegetation clearance and terracing, with the area being utilised as paddocks, as illustrated in Figure 22 below. Items numbered 1 and 2 are Burgess Lane and the existing 330kV electrical transmission lines respectively.

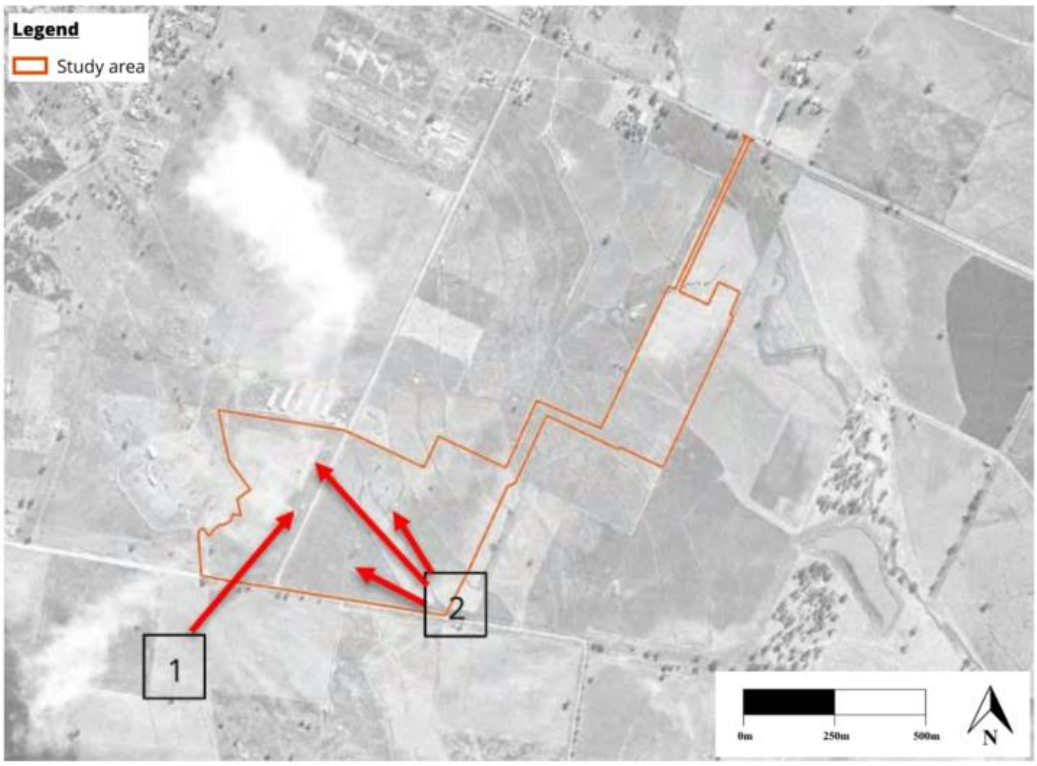


FIGURE 22 – AERIAL PHOTOGRAPHY FROM 1976

Source: Biosis, from NSW Spatial Services

The HAIS confirms there are no significant changes to the 1997 study area, as illustrated in Figure 23 and Figure 24 below.

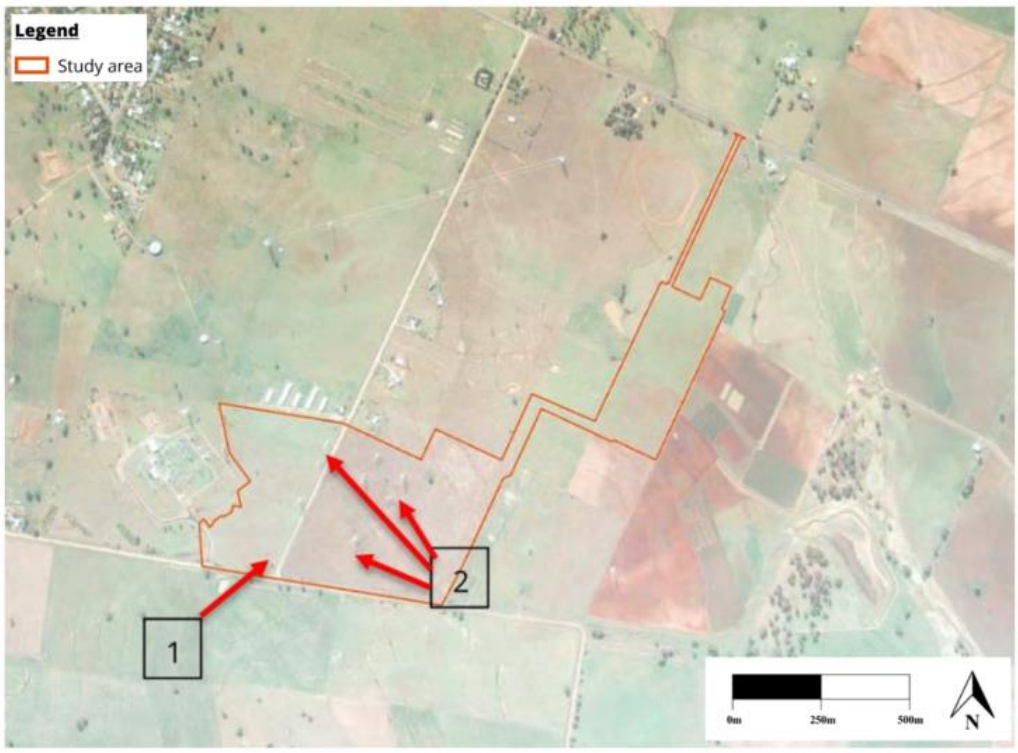


FIGURE 23 – AERIAL PHOTOGRAPHY FROM 1989

Source: Biosis, from NSW Spatial Services

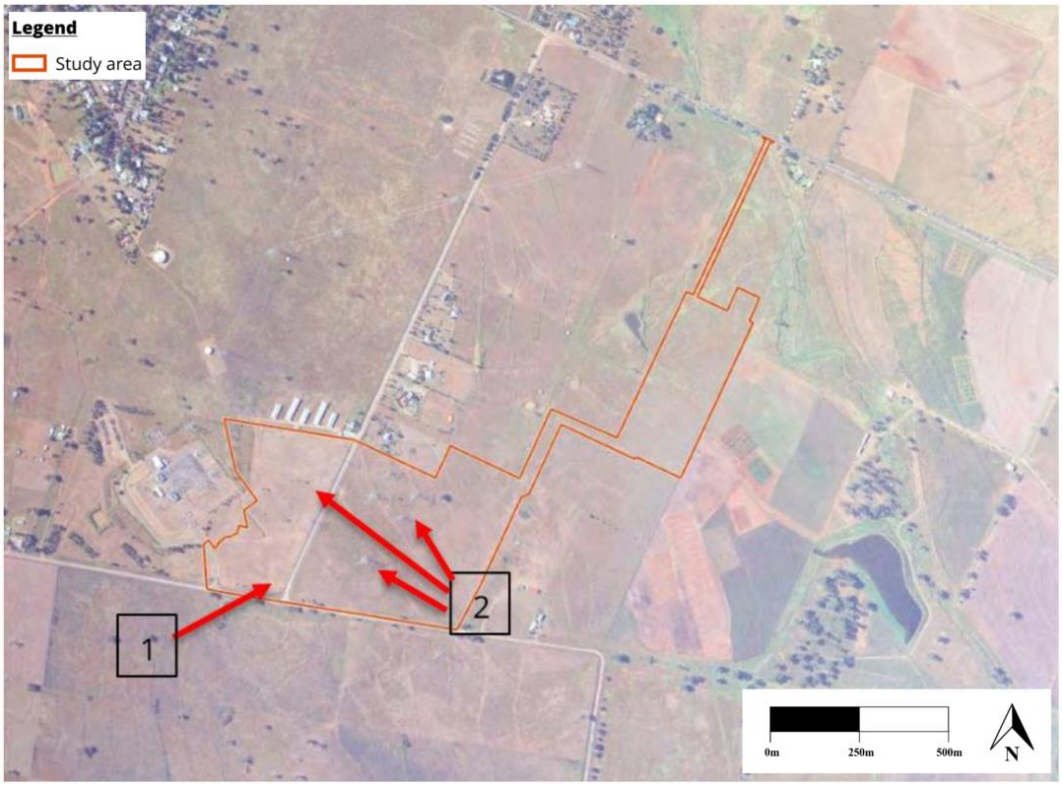


FIGURE 24 – AERIAL PHOTOGRAPHY FROM 1997

Source: Biosis, from NSW Spatial Services

Current aerial imagery shows heavy ploughing and excavation of soils in the southern portion of the study area, with planted trees lining a fence line. The site contains two shed structures with fencing and a dirt track also visible.

A chronology of the study area is provided in Table 28 below from the HAIS.

TABLE 28 – CHRONOLOGICAL DEVELOPMENT OF STUDY AREA

DECRIPTION	DATE
Hunter River explored by European settlers	1797
Settlement established at the Hunter River	1801
Liverpool Plains region by Surveyor General John Oxley	1817-1818
Settlement established within the Liverpool Plains	1824
Formation of the AACo	1824
Acquisition of 316,000 acres (130,000 hectares) of land along the Peel River by the AACo	1832
Establishment of Kallala (Calala) Station	1834
Kallala Station relocates to Goonoo Goonoo	1841
Subdivision of the initial land grant to the AACo, with the study area located within parish portions 28, 29, and 30	1909
Extensive vegetation clearance and terracing within the study area and the construction of Burgess Lane [1] and a transmission line present in the south-western corner of the study area [2]	1976
Terracing and potential excavation of soils can be seen throughout the extent of the site	1989
Heavy ploughing and excavation of soils in the southern portion of the study area has occurred, with planted trees along the fence	2022

DECRIPTION	DATE
line within the study area. Two shed structures are present in the central portion of the study area, with the fence line present. A dirt track in the northern portion of the study area has also been constructed.	

Three inspections of the site were undertaken by Biosis to inform the HAIS on 16 August 2022, 13 December 2022 and 15 June 2023. The purpose of the inspections was to identify the heritage values and archaeological potential associated with the study area which includes buildings, structures, places, relics or other works of historical, aesthetic, social, technical/research or natural heritage significance, or places including conservation areas, sites, precincts, gardens, landscapes and areas of archaeological potential. The inspections identified the following:

Landscape character

The study area consists of part of a lot located across an extensive rolling to undulating hill landscape. It is bordered on all sides by private property, and consists of agricultural paddocks, landform modification and agricultural sheds. The study area appears to have been used primarily for grazing and agricultural practices.

Built fabric assessment

The study area only contained two farm sheds and fence lines, which reflect the rural nature of the study area. The sheds were primarily constructed of corrugated sheet metal.

Archaeological assessment

The historical context presented in the HAIS indicates that the study area was extensively cleared and utilised for agricultural and pastoral purposes prior to the 1970's. A transmission line was constructed in the study area pre-1976. A review of Crown Plans and aerial imagery indicated that no physical structures were constructed in the study area until c.2000, with the primary use being for agricultural and pastoral uses. While the smaller farming sheds located on the survey do not appear on aerial imagery, observations of their condition and structure indicate they were constructed during the 2000s. As a result, the only potential archaeological resource predating the 2020's in the area would be associated with the agricultural and pastoral activities undertaken in the study area. This may consist of post holes from fence lines, agricultural marks such as plough lines and refuse relating to agricultural activities such as construction materials for the sheds or fences.

The built existing structures consist of corrugated iron with steel frame farm sheds, which are common throughout rural properties. There are no potential archaeological resources associated with these structures, as they are still present in the study area.

Based on the above, Table 29 below provides an assessment of the archaeological potential of the structures within the site.

TABLE 29 – ARCHAEOLOGICAL POTENTIAL ASSESSMENT

ITEM	FEATURE/S	POSSIBLE CONSTRUCTION DATE	ARCHAEOLOGICAL POTENTIAL
Agricultural and pastoral land uses	Fence lines, post holes, agricultural marks, farm sheds		Low
Burgess Lane	N/A – modern structure	Pre-1976	N/A
Transmission lines	N/A – modern structures	Pre-1976	N/A
Shed	N/A – modern structure	Pre-2022	N/A

ITEM	FEATURE/S	POSSIBLE CONSTRUCTION DATE	ARCHAEOLOGICAL POTENTIAL
Shed	N/A – modern structure	Pre-2022	N/A
Fence line	N/A – modern structure	Pre-2022	N/A
Access track	N/A – modern feature	Pre-2022	N/A

Figure 25 below provides an overview of the archaeological potential within the study area.

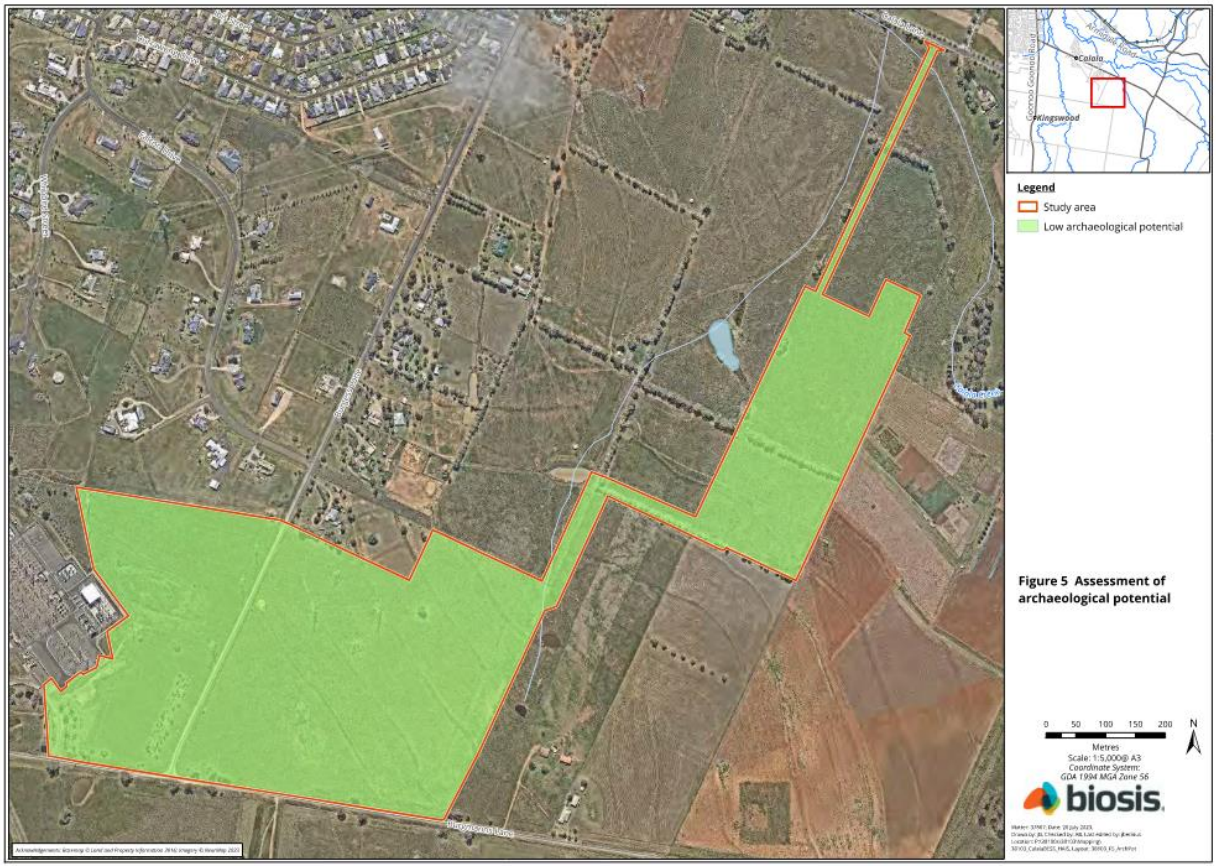


FIGURE 25 – ARCHAEOLOGICAL POTENTIAL PLAN

Source: Biosis

Based on the above, there is low archaeological potential within the study area.

6.3.2 Impacts

The HAIS considers the potential impacts of the development on the heritage significance of any site or place broadly defined as the 'aesthetic, historic, scientific or social values for past, present or future generations'.

The criteria below has been established based on the Burra Charter to provide consistency with heritage agencies in other States and to avoid ambiguity and misinterpretation.

Criterion A: An item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area).

Archaeological remains that may be present include fence lines, post holes and agricultural marks. Based upon the historical context and documentary evidence presented within the HAIS it has been

determined that these are not of importance in the pattern of NSW's cultural or natural history. Additionally, it is unlikely that archaeologically significant remains will occur within the study area.

The current structures in the study area are sheds which were constructed c.2000s. These sheds are modern in construction and are not of importance in the pattern of NSW's cultural or natural history.

The potential archaeological remains and built structures do not satisfy this criterion at a local or state level.

Criterion B: An item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local area).

The study area has been used for agricultural purposes since 1832. Archaeological remains associated with agriculture consist of fence lines, post holes and agricultural marks. There are no special associations relating to the Australian Agricultural Company who were granted the land, or subsequent owners and the historical research did not indicate the study area had any association with anyone of importance in NSW's cultural history, or the history of the local area. The built structures are not from this period of use.

The potential archaeological remains and built structures do not satisfy this criterion at a local or state level.

Criteria C: An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area).

Archaeological remains that may be present include fence lines, post holes and agricultural marks. Archaeological remains such as these would not demonstrate aesthetic characteristics of a high degree of creative or technical achievement in NSW or the local area.

The current structures in the study area are sheds which were constructed in the 2000s. Structures such as these are common in agricultural settings and do not demonstrate aesthetic characteristics and/or a high degree of creative or technical achievement in NSW or at the local level.

The potential archaeological remains and built structures do not satisfy this criterion at a local or state level.

Criterion D: An item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons.

While no community consultation has been undertaken for the HAIS, the history has not indicated that the potential archaeological remains or current structures would have an association with a particular community or cultural group in NSW or the local area.

The potential archaeological remains and built structures do not satisfy this criterion at a local or state level.

Criterion E: An item has the potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area).

Archaeological remains that may be present include fence lines, post holes and agricultural marks. Archaeological remains such as these are not uncommon in a study area which has been used for agricultural purposes.

The current structures in the study area are sheds which were constructed in the 2000s. Structures such as these are common in agricultural settings and are not uncommon, rare or endangered aspects of the area's cultural or natural history.

The potential archaeological remains and built structures do not satisfy this criterion at a local or state level.

Criterion F: An item possesses uncommon, rare or endangered aspects of the area's cultural or natural history (or the cultural or natural history of the local area).

Archaeological remains that may be present include fence lines, post holes and agricultural marks. Archaeological remains such as these are not uncommon, rare or endangered in a study area which has been used for agricultural purposes.

The current structures in the study area are sheds which were constructed in the 2000s. Structures such as these are common in agricultural settings and are not uncommon, rare or endangered aspects of the area's cultural or natural history.

The potential archaeological remains and built structures do not satisfy this criterion at a local or state level.

Criterion G: An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places, or cultural or natural environments (or a class of the local area's cultural or natural places, or cultural or natural environments).

The historical research and inspection have not indicated that the types of potential archaeological remains or current built structures within the study area would be important in demonstrating the principal characteristics of a class of NSW's cultural places or environments.

The potential archaeological remains and built structures do not satisfy this criterion at a local or state level.

Summary

The above assessment and the findings of the HAIS has not revealed any evidence of items, activities, or events occurring within the study area which are historically significant, either to the local area or NSW. Archaeological remains that may be present within the study area are likely to include fence lines, post holes, agricultural marks and farming sheds which hold no research potential and are unlikely to provide information that is of importance in the pattern of NSW's cultural history at a state or local level. The study area is not associated with a significant figure or community group within the local area and possesses low aesthetic value due to disturbances.

6.3.3 Mitigation

As identified above, the proposed development, subject site and broader locality is void of any heritage items or places. On this basis, the management and mitigation measures are limited. Section 6 of the HAIS recommends the following management and mitigation measures:

- **The proposed works may proceed with caution**

There are no listed items, or items of heritage significance, within or adjacent to the study area. Works can proceed in the study area with caution as it has been assessed as possessing low archaeological potential. Should unexpected archaeological remains be uncovered during the course of the proposed works, Recommendation 2 should be implemented.

- **Discovery of unanticipated historical relics**

Relics are historical archaeological resources of local or State significance and are protected in NSW under the Heritage Act. Relics cannot be disturbed except with a permit or exception/exemption notification. Should unanticipated historical archaeology be discovered during the course of the project, work in the vicinity must cease and an archaeologist contacted to make a preliminary assessment of the find. Heritage NSW will require notification if the find is assessed as a relic.

6.4 Land Use Conflict

A Land Use Conflict Risk Assessment (**LUCRA**) was prepared by Edge Planning in support of the EIS (refer to Appendix N) in response to the SEARs requirements which state the following:

- ***Land*** *– including:*
    - *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;*
    - *an assessment of the potential impacts of the development on existing land uses on the site and adjacent land, including:*
        - *flood prone land, acid sulphate soils, Crown lands, mining, quarries, mineral or petroleum rights;*
        - *a soil survey to determine the soil characteristics and consider the potential for erosion to occur; and*
        - *a cumulative impact assessment of nearby developments;*
    - *an assessment of the compatibility of the development with existing and proposed land uses, during construction, operation and after decommissioning, including:*
        - *consideration of the zoning and future zoning provisions applying to the land and nearby areas, including subdivision (if required);*
        - *completion of a Land Use Conflict Risk Assessment in accordance with the Department of Primary Industries Land Use Conflict Risk Assessment Guide; and*
        - *assessment of the impact on agricultural resources and agricultural production on the site and region.*

The LUCRA addresses the final two point of the SEARs requirement above. The report aims to identify and assess the potential land use conflicts associated with the BESS, identify the surrounding land uses, assess the impacts of the BESS on the surrounding land uses, and make recommendations to minimise the impact of the BESS on the surrounding land uses. The scope of the LUCRA is confined to the operation of the BESS and does not address construction impacts.

6.4.1 Existing environment

6.4.1.1 Nature of the Land Use

The site is currently used for horse grazing and consist of mostly cleared rural land. The land surrounding the site consists of rural residential use, extensive agriculture public use and some irrigated cropping on the Peel River flats. Calala village is located 500m to the west along Calala Lane. The most dominant land use in the vicinity is rural residential. The presence of agriculture and its associated pollution near residential development can lead to a loss of amenity for residents. The LUCRA states that it is preferable not to have agricultural land uses in the vicinity of residential uses.

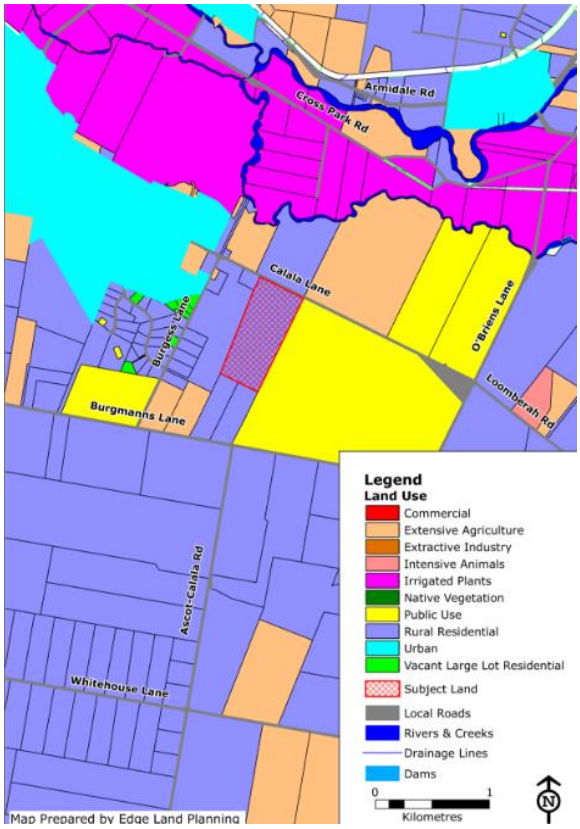


FIGURE 26 – LAND USE TYPES

Source: Edge Land Planning

6.4.1.2 Topography, Natural Features and Climate

The site, located in the north-west of NSW, features a gentle slope rising from the north, with the highest point being 412m on the southern boundary, down to 392m at the frontage along Calala Lane. About 600m to the north is the Peel River, and Calala Creek diagonally crosses the northern part of the property. An unnamed drainage line runs north-south and connects to Calala Creek, along with a small dam. These water sources are not consistent due to the small size of the catchments.

The land is mostly cleared, with some large, scattered trees and three lines of trees acting as windbreaks. There's some vegetation around the house in the north-eastern corner, and the remaining plant life is best described as planted vegetation.

The climate in this region is classified by the Bureau of Meteorology (BoM) as warm temperate, characterised by warm summers and cool winters, with rainfall mainly in spring and summer. The Tamworth Airport Automatic Weather Station's averages provide a good representation of the general weather in the area, although it doesn't perfectly match the site's specific conditions.

6.4.1.3 Soils

A Land and Soil Capability Assessment (LSCA) prepared by ENV Solutions is provided in Appendix W which describes the soil characteristics at the site of the proposed BESS. The statement has been prepared to specifically address the SEARs requirement to provide *a soil survey to determine the soil characteristics and consider the potential for erosion to occur*.

The soil survey data is summarised in the statement provided in Appendix W which provides the following:

- Sets out the method and results of the soil surveys
- Determines the soil characteristics based on these surveys and desktop resources, including areas that qualify as Biophysical Strategic Agricultural Land
- Assesses the potential for erosion to occur

Figure 27 below provides an overview of the soil sampling locations.

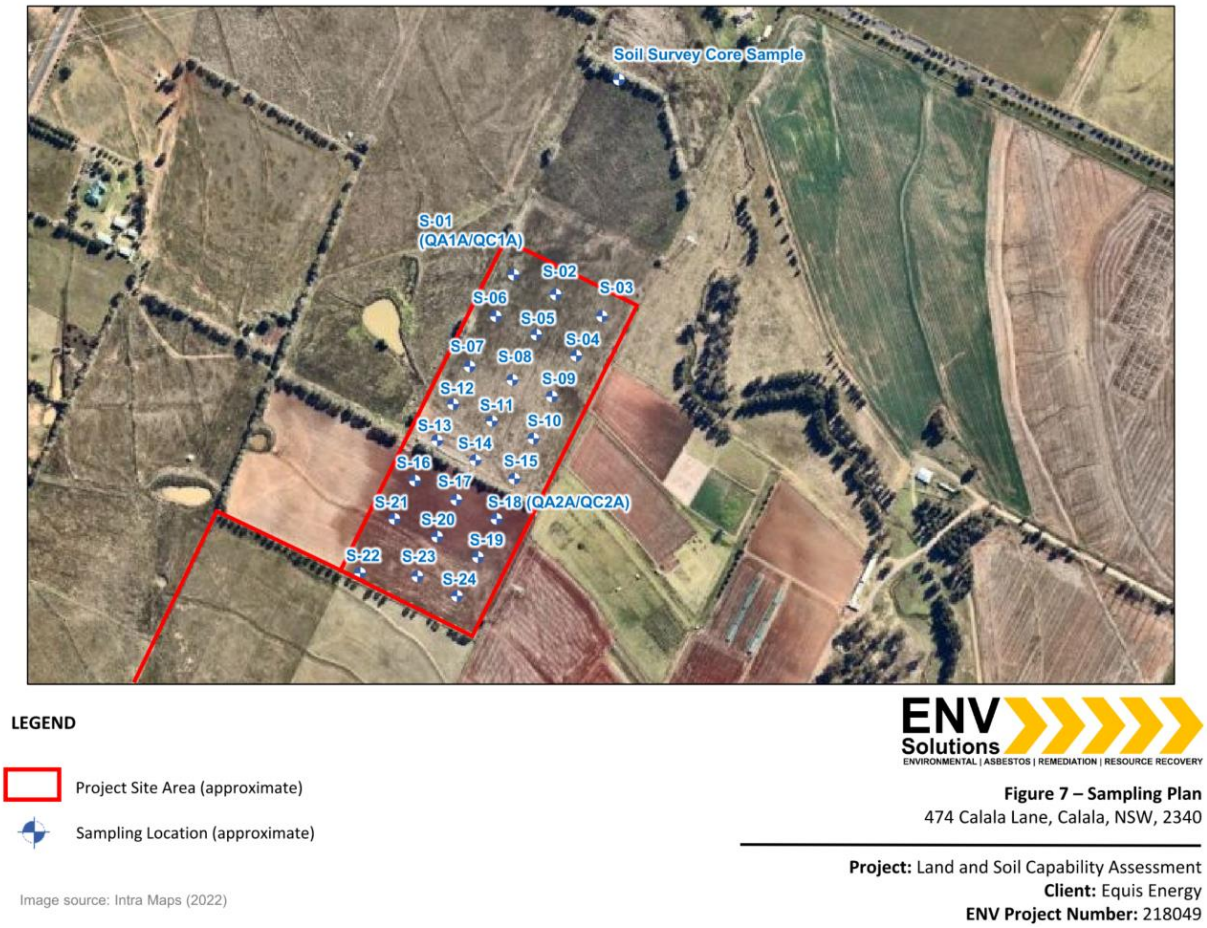


FIGURE 27 – SOIL SURVEY SAMPLING PLAN

Source: ENV Solutions

The LSCA considers the various biophysical features of the land and soil including slop, drainage, climate, landform, soil types and soil characteristics against a range of land and soil hazards. The hazards include wind erosion, soil erosion, soil structure decline, soil acidification, salinity, waterlogging, shallow soils and mass movement. These hazards are given a Land and Soil Capability (LSC) class rating between 1 and 8, with 1 being the highest capability and 8 being the lowest capability.

Table 30 below provides a summary of the LSC class rating for each of the hazards as identified in the LSCA.

TABLE 30 – LSC CLASS RATINGS

HAZARD	LSC CLASS RATING
Water Erosion	2
Wind Erosion	3
Soil Structure Decline	4
Soil Acidification	1

Salinity	2
Waterlogging	4
Shallow Soils and Rockiness	4
Mass Movement	1

Based on the above, the site has a Land and Soil Capability rating of 4 which is defined by the Office of Environment and Heritage as:

"Moderate capability land: Land has moderate to high limitations for high-impact land uses. Will restrict land management options for regular high-impact land uses such as cropping, high-intensity grazing and horticulture. These limitations can only be managed by specialised management practices with a high level of knowledge, expertise, inputs, investment and technology."

The LSCA also considers the Biophysical Strategic Agricultural Land (BSAL) classification of the site based on the Central Recourse for Sharing and Enabling Environmental Data in NSW (SEED). Based on a review of the information available from SEED, the site is not classified as BSAL as illustrated in Figure 28 below. The site is not considered fertile land and has a moderate to high limitation for high impact agricultural uses.

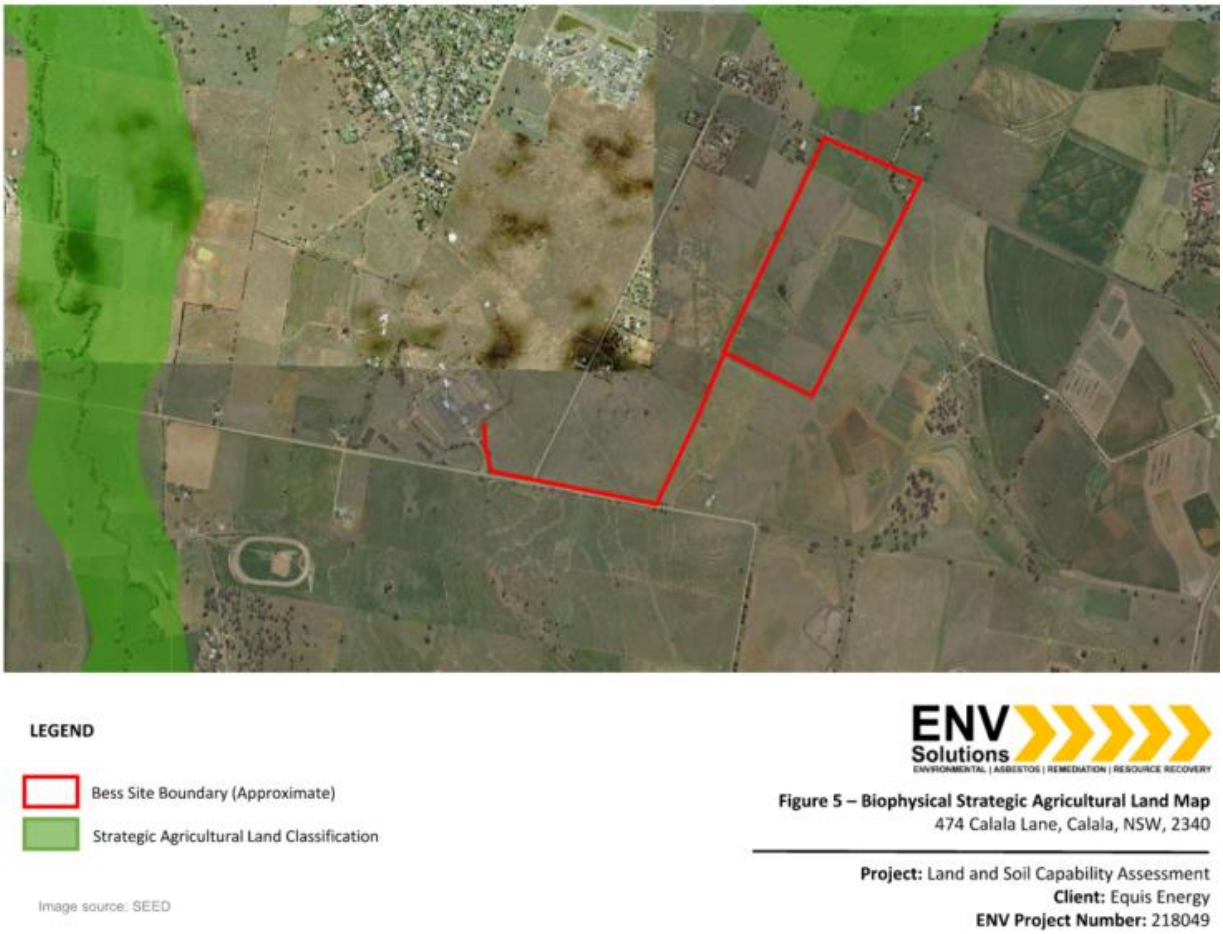


FIGURE 28 – BIOPHYSICAL STRATEGIC AGRICULTURAL LAND MAP

Source: ENV Solutions

6.4.2 Impacts

Unlike typical agricultural land use, which can present various issues like noise, odour, spray drift, dust, surface water and sediment runoff, traffic and access, and visual impact, the BESS poses few specific conflicts. These conflicts are generally limited to noise emissions and visual impact.

To address these concerns, a Noise and Vibration Assessment was conducted by Marshall Day Acoustics, a Landscape Character and Visual Impact Assessment was carried out by Envisage Consulting, and a Land and Soil Capability Assessment was prepared by ENV Solutions in 2023.

It's essential to recognise that people may react differently to these conflicts. Just because one neighbour perceives a loss of amenity from a particular aspect doesn't mean that others will experience the same degree of discomfort or loss.

6.4.2.1 Consultation with Neighbouring Residents

Consultation with neighbouring residents commenced in September 2022 consisting of a letter drop, which was followed by face-to-face meetings in October 2022. During a consultation session in Tamworth on the 14th of December 2022, the local community and neighbours adjoining the subject site were consulted about the proposal. The primary concerns raised related to potential noise and visual impact from the BESS. Additional community FAQ newsletters were issued to surrounding residents in October 2023 and follow up 1:1 discussions with individual landholders occurred with interested parties.

6.4.2.2 Noise

Noise can affect the surrounding rural residential and residential areas. Specific noise-generating components of the BESS include:

- One hundred and twenty-eight inverters
- Six auxiliary transformers
- Two hundred and forty DC combiners
- Nine hundred and sixty battery units
- Two high voltage transformers

The methodology adopted for the assessment of acoustic impact is detailed in Section 6.6 of this EIS. For the purposes of the LUCRA, the findings of the NVIA are adopted.

6.4.2.3 Visual Impact

The visual appearance of a development can affect the visual enjoyment of the surrounding rural residential and residential areas. Below are the components that are anticipated to impact the visual amenity of surrounding land uses:

BESS and Inverters: Nine hundred and sixty BESS storage units are proposed, each 2.7m high, similar in scale to shipping containers. They will be aligned at ground level on a raised pad and connected to inverters that stand 2.9 metres high.

Substation and Switchyard: The inverters will be connected to an onsite substation and switchyard via underground cables. This includes auxiliary transformers up to 10.3m high.

Underground Transmission Cable: A new 330 kV underground cable will connect the switchyard to the existing 330 kV TransGrid Tamworth Substation, about 1km away.

Control Room and Warehouse: Within the BESS, small metal buildings up to 4.5m high are proposed, including a control room, operations and maintenance storage room, and switch room.

Noise Attenuation Wall: A noise wall will surround the northern and western sides of the BESS footprint, with the northern wall around 4m high and the western wall around 5m high.

Perimeter Fencing: Around the BESS development, including the noise wall, a maximum 3m high chain mesh security fence will be installed.

Access: Access to the BESS will be via Calala Lane, with a new all-weather access road built about 40m west of the existing site entrance.

Lighting: Outdoor security and emergency lighting will be included for safety, but the BESS will not be permanently lit at night. Any lighting will comply with Australian Standard AS4284 1997 – Control of Obtrusive Effects of Outdoor Lighting and principles of the Dark Sky Planning Guideline.

Tree Removal: The proposal also includes the removal of planted native trees within the development footprint, which could be up to 15m in height.

These components together form the visual elements of the proposal and will contribute to how it integrates with and impacts the existing landscape.

The methodology adopted for the assessment of visual impact is detailed in Section 6.56.6 of this EIS. For the purposes of the LUCRA, the findings of the LCVIA are adopted.

6.4.3 Mitigation

The methodology for assessing and managing land use conflicts is anchored in a systematic procedure that consists of three key stages: hazard identification, risk assessment and ranking, and risk control development. This begins with the preparation of the LUCRA Hazard Identification and Risk Control form, listing all hazards associated with each activity, assessing and ranking the risk arising from each hazard before controls are applied, and developing controls that minimise the probability and consequence of each risk using five-level methods. Risks are then re-ranked with controls in place to ensure that they have been reduced to an acceptable level.

The risk rank of each environmental impact is identified by combining ‘consequence’ (a number 1 to 5) with ‘probability’ (a letter A to E) in the Risk Ranking Table shown in Figure 29. The table yields a risk rank ranging from 25 (highest magnitude of risk, highly likely, and very serious event) to 1 (lowest magnitude or risk, an almost impossible, very low consequence event). This system facilitates a nuanced understanding of both the potential harm and the likelihood of that harm occurring, enabling comprehensive risk management. It is noted that a risk rating below 10 is deemed to be an acceptable risk and as such, the endeavour is to lower the identified risks below this threshold.

PROBABILITY	A	B	C	D	E
Consequence					
1	25	24	22	19	15
2	23	21	18	14	10
3	20	17	13	9	6
4	16	12	8	5	3
5	11	7	4	2	1

FIGURE 29 – RISK MATRIX

Source: Edge Land Planning

6.4.3.1 Noise Impact Mitigation

Operational noise from the BESS has been identified as a concern that requires mitigation, as it will be emitted 24 hours a day, seven days a week. A comprehensive Noise and Vibration Impact Assessment report was conducted (refer to Appendix O), employing noise modelling against the stringent evening and night period project noise trigger levels due to the 24-hour operation of the BESS. The assessment identified that noise levels would exceed the background noise level for five of the nearest dwellings, with non-compliance ranging from 2 dB(A) to 5 dB(A).

To address this issue and achieve compliance with the relevant noise criteria, the report recommended specific noise control measures. These measures include the construction of perimeter noise barriers on the north and west boundaries of the BESS, measuring 4 meters in height on the northern boundaries and 5 meters on the western boundaries. By implementing this control, the risk ranking related to noise has been significantly reduced from an unacceptable level of 21 to an acceptable level of 8. This intervention demonstrates a commitment to adhering to noise regulations and safeguarding the amenity of the nearby residences.

6.4.3.2 Visual Impact Mitigation

The LCVIA for the BESS has taken into consideration various aspects of the visual impact on the surrounding environment. The assessment found that the landscape has a low sensitivity to change, with the magnitude of the proposed alterations being moderate. Though the site will be substantial in size, its location on a flat and relatively inconspicuous site, with minimal alterations to the landform, will help diminish its visual presence. The assessment also observed similarities between the proposed substation and existing energy infrastructure in the area, such as transmission towers and the existing TransGrid Tamworth substation, making it a relatively familiar element within the landscape.

To further mitigate the visual impact, the most prominent features, including the noise attenuation barrier and tall components of the proposal, will be coloured to blend with the landscape. Moreover, a proposed landscape plan aims to create a quick-growing dense screen along the northern and western boundaries of the development footprint. This screen will serve as a visual barrier for surrounding dwellings and public roads, contributing to the successful reduction of visual impact from an unacceptable to an acceptable level. This approach demonstrates sensitivity to the aesthetic quality of the environment while accommodating the essential infrastructure needs. Initially, the visual impact was ranked at an unacceptable level of 17, but with control measures, it has been reduced to an acceptable rating of 5.

6.5 Landscape Character and Visual Assessment

A Landscape Character and Visual Impact Assessment (**LCVIA**) was prepared by Envisage Consulting in support of the EIS (refer to Appendix N) in response to the SEARS requirements which state the following:

- ***Visual*** *– including a detailed assessment of the likely visual impacts (including night lighting) of all components of the project (including transmission lines and any other ancillary infrastructure) on surrounding residences, 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 (2016).*

The LCVIA addresses the SEARs requirement above. The assessment aims to assess the visual impact of the BESS on the area's character and sense of place as well as the BESS' impact on views. The assessment is based upon principles contained in Transport for NSW's '*Guideline for Landscape Character and Visual Impact Assessment, Environmental Impact Assessment Practice Note EIA-N04'*, 2020 and '*Guidelines for Landscape and Visual Impact Assessment'*, the United Kingdom's Landscape Institute and Institute of Environmental Management and Assessment, 2013. Moreover, the project is situated within 200km of Siding Spring Observatory and therefore the '*Dark Sky Planning Guideline'*, 2023 applies.

6.5.1 Existing environment

6.5.1.1 Existing Landscape Character

Calala, situated in the New England Tablelands region of NSW, is characterised by its elevated undulating granitic slopes, pasture grasses and sparse trees. These slopes provide a distinctive backdrop to the local views and define the landscape.

Agriculture dominates the local land use, with features including open pastures, timber fencing, farm machinery, sheds, and homesteads set back from roads, either sealed or unsealed. Trees frequently define property boundaries, lining fence lines and creek corridors.

The area is also home to several prominent institutional facilities, such as Farrer Memorial Agricultural High School, Tamworth Agricultural Institute, the NSW Department of Primary Industries, and the NSW Office of Water.

Energy infrastructure is a prominent feature in the landscape, with the visual presence of numerous transmission towers and TransGrid's substantial Tamworth Substation. Closer to Tamworth, the land use shifts predominantly to residential. This includes large lots, ranging from 0.5 to 1 hectare, with primarily single-storey homes, surrounded by expansive grassed yards. Additionally, there are both contemporary and older-style detached single-storey dwellings, with varying lot sizes, all contributing to the regional character and broad landscape zones of this part of NSW.

6.5.1.2 Physical characteristics of the project site

The site is low-lying and matches the character of the surrounding area in Calala. It consists of a homestead set back from Calala Lane, cleared paddocks for agricultural use, typical post and wire farm fencing, trees along fence lines, and a farm dam.

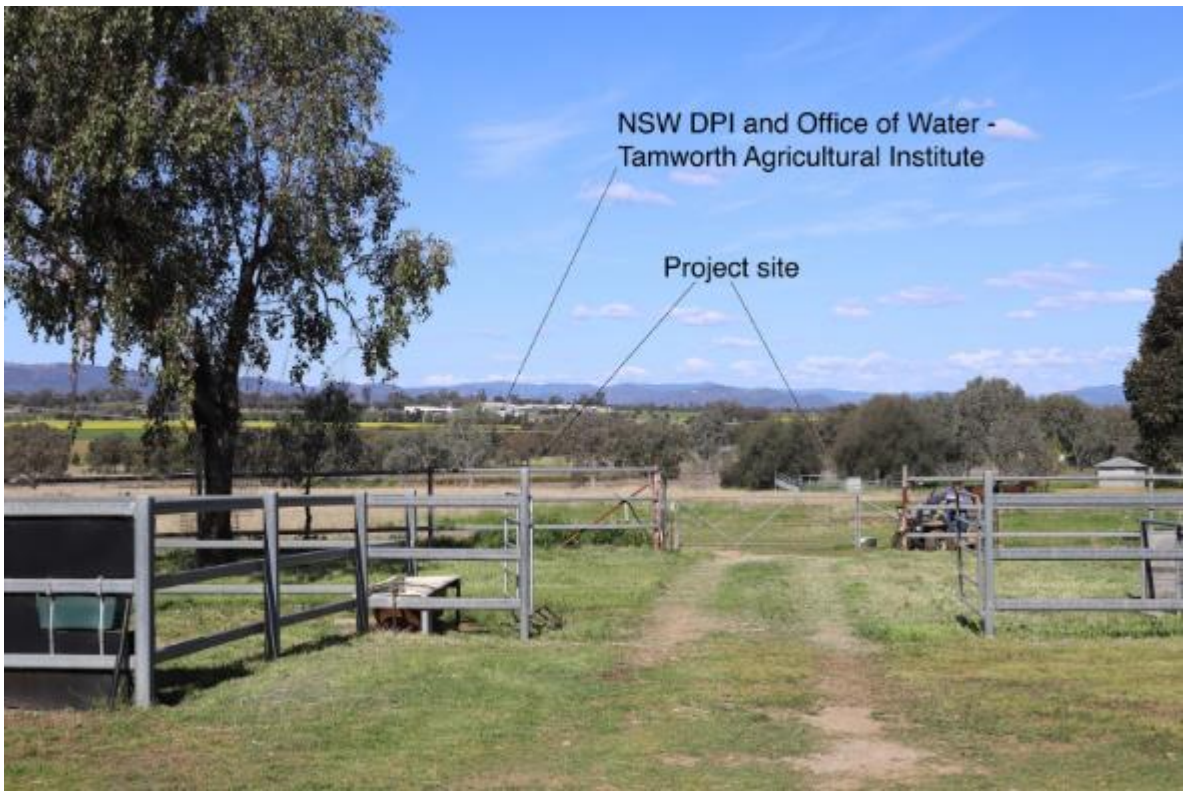


FIGURE 30 – EXISTING VIEW LOOKING EAST TO THE SITE

Source: Envisage

FIGURE 31 – EXISTING VIEW LOOKING NORTH-EAST TO THE SITE

Source: Envisage

6.5.1.3 Viewpoints

The viewpoints to the BESS theoretically visible were identified in a viewshed analysis contained in Figure 32.

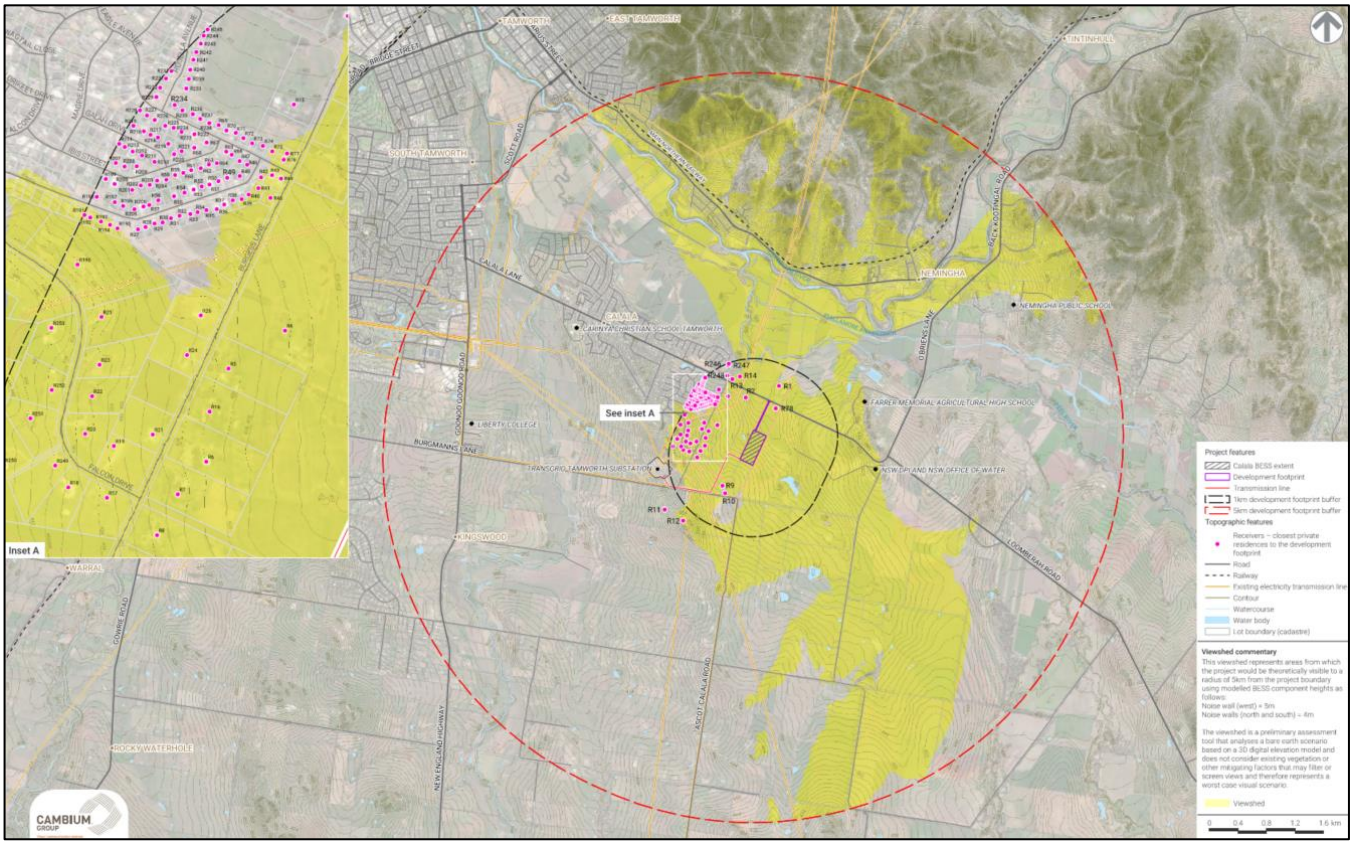


FIGURE 32 – VIEWSHED

Source: Envisage

However, it was determined that the project is not likely to be visible from many of the locations identified in the viewshed analysis due to vegetation, farm sheds, and other built structures that cannot be accounted for in the viewshed analysis. The viewpoints identified as having at least a partial view of the BESS include:

- Residential viewpoints:
    - R1 on the northern side of Calala Lane
    - R8 on the eastern side of Burgess Lane
    - R9 on the northern side of Burgmanns Lane
    - R12 on the southern side of Burgmanns Lane
    - A few residences within the General Residential Zone
    - Some residences within the Large Lot Residential Zone, and
    - Some elevated residential areas along the A15/B56 (Nemingha and East Tamworth).
- Non-residential viewpoints:
    - Burgess Lane
    - Burgmanns Lane
    - Calala Lane
    - Institutional facilities to the east (Farrer Memorial High School, NSW Department of Primary Industries, Tamworth Agricultural Institute and NSW Office of Water), and
    - Flagstaff Mountain.

6.5.1.4 Planning Context

Under the *Tamworth Regional Local Environmental Plan 2010* the site is zoned RU4 Primary Production Small Lots. There are no specific provisions in the *Tamworth Regional Local Environmental Plan 2010* that relate to scenic amenity in the zone, however, an objective of the zone is to 'minimise conflict between use within this zone and land uses within adjoining zones'.

The closest adjoining zones are R5 Large Lot Residential (0.5 to 1 hectare lots) and R1 General Residential (approximately 800m^2 lots). An objective of the R4 zone is 'to provide residential housing in a rural setting while preserving, and minimising impacts on, environmental sensitive locations and scenic quality'. The RU4 zone contributes to the 'rural setting' and 'scenic quality' that the residents of the R5 zone experience.

6.5.1.5 Existing Lighting

The site currently does not emit any notable light due to its current agricultural use and therefore has minimal impact on levels of artificial skyglow. However, the surrounding area consists of urban development such as residences, sports fields, commercial buildings and streetlighting. The lighting from the surrounding area potentially has a significant effect on the existing level of skyglow.

6.5.2 Impacts

6.5.2.1 Impact to Landscape Character

During community consultation, visual concerns regarding the character of the area was raised by five of the fourteen neighbouring landholders who did not want their rural outlooks to be impacted "by looking at ugly batteries or cement walls". The assessment of the impact of the BESS on the landscape character of the area relied on the area's sensitivity (based on designations, quality, and cultural values) and magnitude of the proposal on the landscape character (scale, contrast, and duration). The existing sensitivity of the landscape character of the area to accommodate the BESS is 'low', and the magnitude of the development on the landscape character is assessment 'moderate'. The overall landscape character impact is 'moderate-low'.

Sensitivity: Low

Landscape Designations

- The site is not within a designated scenic landscape and is not recognised as having national or regional scenic landscape value.
- The rural landscape character of Zone RU4 is not specified for protection under the *Tamworth Regional Local Environmental Plan 2010*. However, the rural character of the zone contributes to the 'scenic quality' and 'rural setting' of adjoining residential zones.

Landscape Quality and Characteristics

- The landscape of the site is typical in the New England Region.
- The landscape contains valuable elements; however, the overall scenic quality is reduced due to transmission towers, the existing substation, and dense residential development.

Cultural Heritage

- The landscape is identified as being locally important to Aboriginal people, but no items or sites of significance are located on the development site.
- There are no heritage items located on or adjoining the site.

Magnitude of Change: Moderate

Physical Scale

- The BESS will have a significant development footprint compared to surrounding built structures.
- The noise attenuation wall will be longer than surrounding built structures.
- The BESS and its associated structures will be similar in height and scale to surrounding built structures such as agricultural sheds.

Visibility

- The proposed removal of trees within the development footprint increases the exposure of the BESS and removes a feature typical of the landscape.
- The project is located on a flat and relatively unobtrusive site within minimal topographical change.

Contrast and Introduction of New Elements

- The noise attenuation wall will be a muted grey to reduce its contrast and will be lower in scale than surrounding retained trees.
- The BESS battery units will be mostly screened by the noise attenuation wall.
- The taller structures (such as the elevated control room) are to be coloured a muted grey to reduce contrast with the landscape.
- The proposed BESS, being energy infrastructure, will be a familiar element within the landscape because of the existing transmission towers and the TransGrid Tamworth substation in the area.

Duration

- The changes are anticipated to last up to 30 years, therefore impacting the character of the landscape for an extended period of time.
- However, upon decommissioning, the site can be restored to an agricultural land use.

6.5.2.2 Impact to Views

Similar to the assessment of landscape characters, the impact of views is determined by combining the sensitivity of the view to change and the magnitude of the change that the BESS would have on the view. The possible overall impact to each view ranges from 'High' to "Negligible'. The assessment finds that the highest visual impact is 'moderate' at one residence and 'moderate-low' at three residences. The remaining viewpoints experience an impact assessed as 'low'. A summary of the impact to the affected viewpoints in summarised:

TABLE 31 – SUMMARY OF IMPACT TO VIEWPOINTS

VIEWPOINT	SENSITIVITY	MAGNITUDE	ASSESSED VISUAL IMPACT
R1: Private residence (Calala Lane)	Moderate	Low	Moderate-low
R8: Private residence (Burgess Lane eastern side)	Moderate	Low	Moderate-low
R9: Private residence (Burgmanns Lane northern side)	Moderate	Moderate	Moderate
R12: Private residence (Burgmanns Lane southern side)	Moderate	Low	Moderate-low
General Residential Zone	Low	Low	Low
Large Lot Residential Zone	Low	Low	Low
Nemingha / East Tamworth	Low	Low	Low
Calala Lane	Low	Low	Low
Burgess Lane	Low	Low	Low
Burgmanns Lane	Low	Low	Low
Institutional Facilities	Low	Low	Low
Flagstaff Mountain Lookout	Low	Low	Low

6.5.2.3 Lighting

The BESS will minimally impact on the existing night-time appearance of the area as the operation of the BESS does not necessitate major light-emitting activities. No illuminated signage, gas flares, and other major light-emitting activities are not proposed. Although lighting would be installed, the project will not generally be lit at night. The permanent external lighting will be low intensity (except where required for safety or emergency situations), will not shine above the horizontal, and will comply with Australian/New Zealand Standard AS/NZS 4282:2019 – Control of Obtrusive Effects of Outdoor Lighting, as well as principles of the Dark Sky Planning Guideline.

Temporary targeted lighting may be used during commissioning at specific locations but will be shielded and directed toward the work area, avoiding lighting the whole site. In terms of ongoing operation, the BESS will not be lit at night, and attendance at the site during the night will be rare, limited to emergencies or security situations. Inverter stations will have lighting installed but will not use it at night, except for emergencies, and the substation will have lighting for security and maintenance purposes, expected to be used only during emergencies or for security purposes.

6.5.3 Mitigation

6.5.3.1 Landscape Character and View Impact

Mitigation measures for the BESS will be implemented in order to:

- Reduce visibility and contrast of the project in the landscape;
- Minimise impact to existing landscape character and retain existing screening vegetations; and

- Enhance the screening of the project.

Visibility and Contrast

In relation to reducing the visibility and contrast of the project in the landscape, the noise wall colour selection will be tested from the affected viewpoints prior to widescale implementation across the site to ensure visual compatibility and adequate contrast. Highly-reflective materials will be avoided, and project components will not be painted white (or other light colours) unless there is an adequate operational justification (e.g functionality or safety). Insulators at substations will be non-reflective and non-refractive. Low-reflexivity, neutral colours and semi-gloss or matte finishes will be used throughout the project, and non-reflective finishes and colour-treatments must be maintained and repaired when necessary. The site will not install commercial messages or obtrusive signage at the project entrance on Calala Lane. During construction, the site will be kept neat and orderly, with wind erosion controls such as watering exposed areas or covering stockpiles of loose materials implemented if soils are disturbed.

Landscape Character

To minimise the impact on the existing landscape character and retain existing screening vegetation, the design of the BESS will prioritise the retention of trees within the site wherever possible. The LCVIA identifies the trees within the footprint of the BESS that are required to be removed, and identifies the trees along the southern boundary and the north western boundary of the development footprint being retained. This will ensure the landscape character of the site and locality will not be adversely affected, and the development will be partially screened from view by existing mature vegetation. During construction, existing trees that are earmarked for retention will be protected from potential damage. This includes taking precautions against harm from vehicle movements, stockpiling, and other construction activities.

Screening

In relation to screening of the BESS, retaining existing vegetation and the additional perimeter screen planting will minimise visual prominence around the development footprint, particularly along the northern, southern and western boundaries, as detailed in the provided concept landscape. There are some areas where perimeter screening planting is not feasible, such as along the eastern development footprint boundaries due to safety and maintenance concerns. Furthermore, at the detailed design stage, a detailed landscape plan will be prepared, and will be informed by consultation with local land care and Council, to ensure that the species planting strategy aligns with the local environment and community preferences.

Mitigation to Most Impacted Receivers on the Southern Boundary

The highest assessed impact was “moderate” to receiver R9 located approximately 450m from the south of the BESS site. R9 is situated on an elevated topography, giving it a relatively clear view across the BESS site. It is noted that trees on the southern boundary of the BESS will be retained and the views of the substation and BESS are obscured by the topography and trees along the boundary. Notwithstanding, R9 will have some visibility of the development beyond the trees. The impact is reasonably mitigated through the retention of existing trees along the boundary, use of low-reflexivity, neutral colours and semi-gloss or matte finishes throughout the project, reducing the visual impact of the BESS in the context of the landscape.

Furthermore, background vegetation and existing electrical infrastructure in the area will reduce the prominence of the BESS. The BESS will occupy a relatively small area within the wide view available, which is largely adversely affected by the existing various transmission lines and towers. It is noted the Asset Protection Zone around the permitter of the BESS is required to minimise bushfire risk and must be free of all combustible materials. As such, all feasible mitigation measures have been implemented.

6.5.3.2 Mitigation for Night Sky Impacts

To avoid impacts on the night sky, the design and installation of lighting for the Project will adhere to good lighting design principles, as outlined in the *Dark Sky Planning Guidelines*. These principles include ensuring that light has a clear purpose, eliminating upward spill light, directing light downward and avoiding light trespass, using shielded fittings, avoiding excess lighting, and switching lights off when not needed. Energy-efficient bulbs, asymmetric beams, and directing lights away from reflective surfaces will further reduce any potential impacts. During construction, all lights will be turned off before leaving the site at the end of the day, and the lighting will be installed according to AS4228-1997 – Control of Obtrusive Effects of Outdoor Lighting. During operation, lights will be switched off when not required, and will only be used in exceptional circumstances such as emergencies or security situations. This approach aims to minimise the visual intrusion of the Project into the night sky and maintain the existing night-time appearance of the area.

6.6 Noise

A Noise and Vibration Assessment prepared by Marshall Day Acoustics has been prepared in support of this EIS to address the requirements of the SEARs which states the following:

- ***Noise*** *– including 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), and a draft noise management plan if the assessment shows construction noise is likely to exceed applicable criteria;*

The NVIA addresses the SEARs requirement above. The assessment is prepared to assess the relevant operational and construction noise of the BESS with regard to the NSW EPA *Noise Policy for Industry* dated 2017, NSW DECC *Interim Construction Noise Guideline* dated 2009, *NSW DECCW* publication *NSW Road Noise Policy* dated 2011, and NSW DECC *Assessing Vibration: A Technical Guideline* date 2006.

6.6.1 Existing environment

6.6.1.1 Existing Noise Environment

Marshall Day Acoustics reviewed the project site and selected five sensitive receivers (refer to Table 32) for the purposes of the background noise assessment, including R1, R2, R4, R6, and R9. However, as approval to deploy noise monitoring equipment was not provided by receiver R1, access to receiver R4 was not available, and inconsistencies with recorded addresses, the background noise assessment was undertaken at the following sensitive receiver locations: R2, R6, R10, and R16. The background noise monitoring equipment was deployed on the 3rd and 4th of July 2023, and was retrieved on the 25th of July 2023.

Research conducted by the EPA indicates that there is no evidence to suggest noise impacts on amenity occur at levels lower than 35dB L_{PA}. The noise monitoring demonstrated that the background noise levels did not exceed the minimum rural background noise levels prescribed for *Noise Policy for Industry 2017*, which are as follows:

- Day – 35RBL L_{A90} dB
- Evening – 30RBL L_{A90} dB
- Night – 30RBL L_{A90} dB

- Research conducted by the EPA indicates that there is no evidence to suggest noise impacts on amenity occur at levels lower than 35dB L_{PA}.

As such the minimum rural background noise levels were adopted for this development to:

- ensure that receiver noise amenity is protected, and
- avoid a situation where applying a very low background noise level would not improve the level of protection for a receiver but would impose very strict requirements on a new development.

Therefore, in accordance with the *Noise Policy for Industry 2017*, the aforementioned minimum background rating levels have been adopted to represent the background noise environment for all sensitive receivers in Table 32.

6.6.1.2 Sensitive Receivers

The accompanying Noise and Vibration Assessment contains a receptor plan identifying all residential dwellings located within 1000m of the BESS. The majority of the dwellings are located to the north-west in the R1 zone between 500m and 1000m in distance. However, other dwellings located in the RU4 zone are located in closer proximity (some within 500m) to the north, south, and west. The closest receptors in all directions were considered and are identified in Table 32.

TABLE 32 – CLOSEST SENSITIVE RECEIVERS IN ALL DIRECTIONS

RECEIVER ID	LEP ZONING	DISTANCE FROM BESS TO RECEPTOR (m)*
R1	RU4	661
R2	RU4	431
R3	RU4	554
R4 (Associated with the project)	RU4	460
R5	RU4	535
R6	RU4	485
R7	RU4	535
R8	RU4	565
R9	RU4	408
R10	RU4	490
R11	RU4	1,231
R12	RU4	1,124
R16	RU4	533
R44	R1	642
R45	R1	635

*The distances identified in Table 32 are based on the distance measured from the edge of the BESS extent to the receptor position specified in accordance with NPfI requirements. Refer to NVIA for further details.

6.6.2 Impacts

6.6.2.1 Acoustic Impact

The noise generation components of the BESS project include the inverter, the battery unit, the DC Combiner, the Auxiliary Transformer, and the HV Transformer. As the operation of the BESS will continue throughout a 24-hour period, the stringent evening and night period project noise trigger levels were adopted. The noise modelling for the BESS facility without any mitigation measures shows that the predicted noise level exceeds the threshold for Receivers R2, R4, R5, R6, and R16 by up to 5dB. However, with the introduction of suitable noise controls, the acoustic impact of the BESS is reduced such that it does not exceed the noise threshold for all receivers. Details of the proposed noise controls are identified in Section 6.6.3 of this EIS.

6.6.2.2 Construction Noise and Vibration Assessment

Acoustic

The Project's construction will involve road access construction, cable trenching, compound construction, substation construction, equipment deliveries, site benching, vegetation clearance, security fence installation, laying down mulch and gravel, and site rehabilitation.

The forecasted construction noise levels associated with each of the main construction tasks have been indicatively predicted at the nearest receivers to provide an indication of the upper range of noise levels. Noise levels for receivers further away from the site will be lower than that indicated by the construction noise levels used for this assessment. The noise levels are estimated for a range of reasonable scenarios and consider the 'worst-case' scenario where all equipment and plant items are assumed to be occurring at the nearest point in the subject construction area to the receiver and operating at 100% for a 15-minute period. In practice, this is unlikely to occur. The lower bound represents the typical average noise level where a reduced number of equipment items are operating concurrently for the 15-minute period and are distributed throughout the site.

The results show that the upper range of the acoustic impact at the nearest affected receiver is above the Noise Affected Management Level for all proposed construction tasks. The lower range shows that some of the noise levels are predicted to be above the Noise Affected Management Level for the four (4) noisiest construction tasks only. Finally, the construction noise levels are predicted to be below the threshold for Highly Noise Affected Management Levels at all receivers for all assessed construction activities.

Exceedances above management levels are not uncommon in construction projects due to the inherent acoustic impact of construction equipment. The estimated noise levels align with a medium-sized infrastructure project in a semi-rural setting based on prior projects.

Vibration

Predicting vibration propagation through the ground is intricate and uncertain, affected by factors like damping, reflection, and in-ground conditions. In this instance, available public propagation data concerning safe working distances for various equipment has been examined and integrated where suitable.

The *Assessing Vibration: A Technical Guideline* (AVTG) offers guidance on evaluating human discomfort from construction-induced vibrations, differentiating between intermittent, impulsive, and continuous vibration sources. In this assessment, only residential receivers were considered. As per the AVTG, intermittent vibration is measured using the Vibration Dose Value (VDV). Accurate VDV values are specific to site conditions, equipment, and operational durations. Calculating VDV levels during planning isn't typical due to its complexity. Given the Project's significant distance from receivers (around 200m), it isn't directly relevant here. AVTG advises minimizing vibration as much as possible and fostering a comprehensive community consultation program. For this project, stakeholders will be informed about construction activities, schedules, and a complaints procedure as part of the engagement plan.

Some construction activities may induce continuous vibration, depending on their nature and duration. The *NSW RMS Construction Noise & Vibration Guideline* (CNVG) suggests minimum distances from sensitive receivers for high-vibration equipment, with effects tied to human comfort. The equipment used for the Project is expected to generate less vibration than those outlined in the CNVG. Given the 200m distance between the construction site and the nearest receivers, the project isn't anticipated to cause continuous vibration impacts that surpass the outlined criteria.

6.6.2.3 Traffic Noise Assessment

The majority of traffic movements related to the Project will occur during its construction stage, while operational traffic is expected to be minimal and unlikely to have significant noise impacts. Stantec provided construction traffic data, highlighting variable traffic flows with most being low, but with one peak month experiencing elevated construction traffic movements. The main roads related to the project include Calala Lane (primary access to the site) and Goonoo Goonoo Road (4.5km from the site). Other roads like Burgess Lane, Burgmanns Lane, and Ascot-Calala Road will not be relied on for significant project-related traffic movements. Construction traffic will use both aforementioned roads for general transportation and for Over Size Over Mass (OSOM) vehicles. The *Regulatory Noise Policy* (RNP) deems a 2dB increase in noise as barely perceptible. Hence, if road traffic noise increases by 2 dB or less due to the project, no further assessment is required. An increase of 2dB in noise roughly equals a 60% rise in traffic flow.

For Goonoo Goonoo Road, there's less than a 17% increase in traffic, which means noise will increase by less than 2dB. For Calala Lane, there's less than a 24% traffic increase, still below the 60% equivalent to a 2dB noise rise. Therefore, no further noise assessment is required for these roads, as the noise impact on nearby residents will likely be imperceptible.

Most construction traffic is expected during the day, but some night traffic will be needed for the delivery of larger items. Only four OSOM vehicle trips are anticipated during the construction period, with at most two in a peak night-time hour. Goonoo Goonoo Road will not see a significant rise in nighttime heavy vehicles due to construction. Thus, sleep disturbance from noise is not expected to increase noticeably. For Calala Lane, heavy vehicles already frequent the area, with up to 18 heavy vehicle movements occurring in a peak nighttime hour. Thus, the proposed OSOM vehicles will not introduce unusual noise levels.

6.6.3 Mitigation

6.6.3.1 Acoustic Impact Mitigation

The results of the assessment demonstrate that with the inclusion of suitable acoustic controls, the BESS does not exceed the relevant acoustic thresholds for nearby residential receivers.

Perimeter Noise Barriers

The BESS includes the construction of perimeter noise barriers on the north and west boundaries of the site and around the nearfield HV transformers. These proposed barriers will meet the former VicRoads requirements as described in the Bridge Technical Note *Code of Practice Noise attenuation walls*, which provides useful guidance with respect to performance expectations for noise attenuation barriers. The noise attenuation walls must have enough intrinsic airborne sound insulation to ensure that the sound transmitted directly through the barrier is not less than 10 dB below the sound diffracted at the top of the barrier. This requirement can be met through the use of construction materials with a minimum surface density of 20kg/m^2 which may include:

- 3mm thick steel (e.g. Bluescope HW350 – Corten)
- 40mm thick timber
- 10mm thick glass
- 18mm thick Perspex or polycarbonate
- 75mm thick brick or concrete

The barriers must be well sealed and free from holes or gaps, with the base buried to a depth of 10 – 20 cm. A minimum design life of 25 years is generally required, and considerations must be made for wind loading and foundation design. Suppliers that may provide proprietary solutions adhering to BTN007 include Wallmark, Modular Walls, NAP, Noise Control Engineering, and RJE.

Nearfield HV Transformer Noise Barriers

Noise attenuation barriers for near-field HV transformer noise are to be constructed from 200 mm Hebel or equivalent material. Powershield may provide a suitable alternative, offering a tuneable absorption to reduce the low-frequency hum associated with HV transformers.

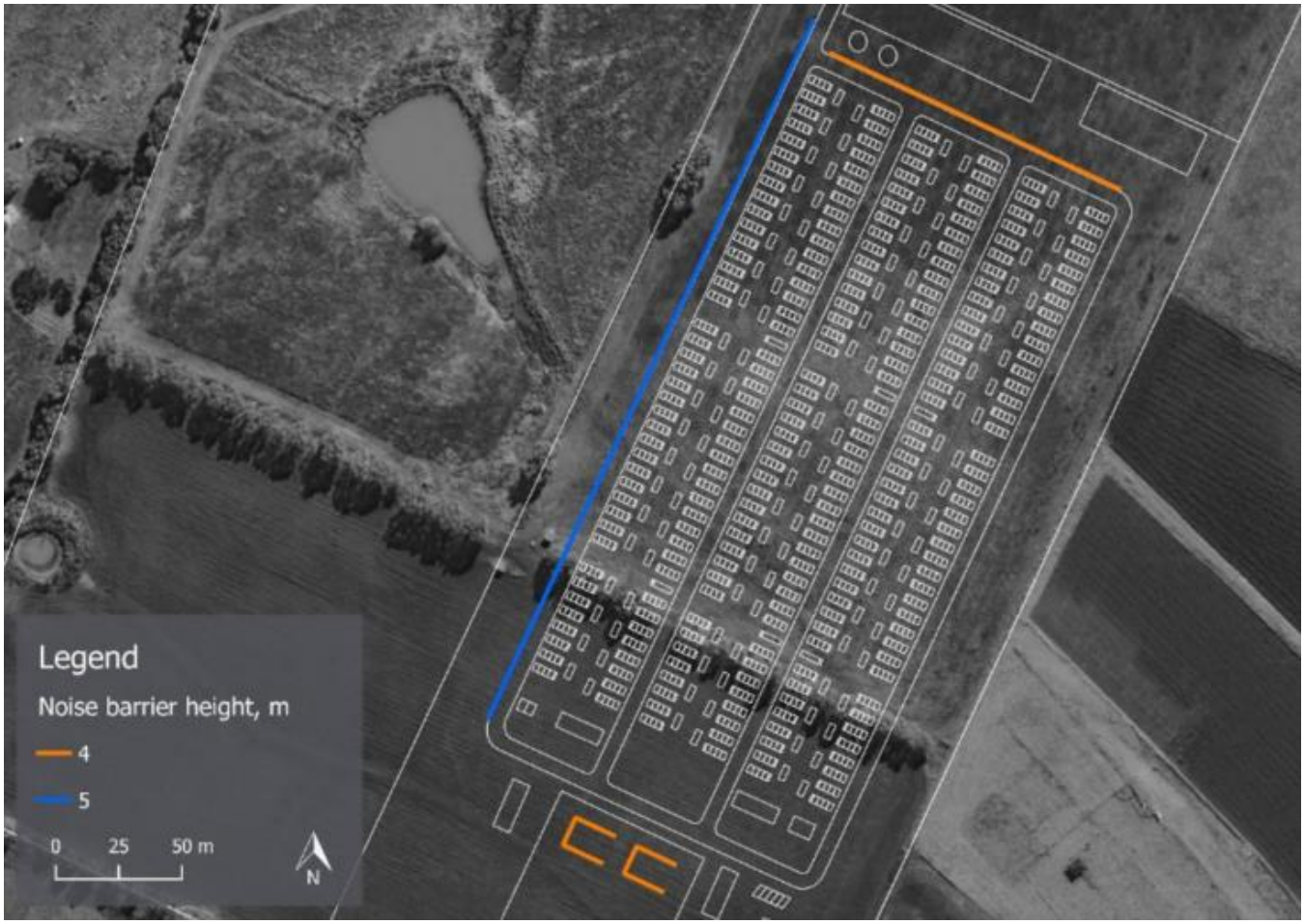


FIGURE 33 – REQUIRED NOISE BARRIERS

Source: Marshall Day Acoustics

6.6.3.2 Construction Noise and Vibration Mitigation

At this stage, only an initial assessment of construction noise and vibration impact is possible. A comprehensive Construction Noise and Vibration Management Plan (CNVMP) should be created once specific details about the construction are finalized.

This CNVMP should incorporate specific noise management practices tailored to the site and the construction process to mitigate noise impacts. The Interim Construction Noise Guideline (ICNG) offers guidance on noise mitigation which will be integrated into the CNVMP, covering areas like:

- Universal work practices
- Consultation and notification

- Plant and equipment
- On-site controls
- Work scheduling
- Transmission path and at-receiver considerations

Generally, it is advisable to limit most construction activities to standard working hours as suggested by ICNG. This minimises noise disturbances during sensitive times. The proposed hours of construction work align with this and are as follows:

- Monday to Friday: 7:00am to 6:00pm
- Saturday: 8:00am to 1:00pm
- Sundays and Public Holidays: No work

However, certain activities might necessitate work outside of these hours, especially those related to public infrastructure, such as transporting oversized items during less busy traffic hours.

For such out-of-hours work, ICNG suggests:

- There must be a strong justification to conduct tasks outside standard hours.
- All feasible and reasonable noise-reducing practices should be employed.
- If, after applying the above measures, the noise is still 5 dB(A) or more above the acceptable level, there should be negotiations with the affected community.

It is important to note that construction work in any specific location is usually short-lived, so any noise disturbances are temporary. With the implementation of reasonable and feasible practices, it's anticipated that the project's construction and decommissioning noise can be effectively managed.

6.6.3.3 Traffic Noise Mitigation

It is recommended that, when possible, OSOM vehicles arrive during the day. If nighttime deliveries are essential, nearby residents, especially in quieter areas, should be informed prior.

6.7 Transport

A Transport Impact Assessment (TIA) prepared by Stantec is attached at Appendix P. The TIA has been prepared to support the proposed development and outline the strategic context of the site, existing conditions, parking, traffic generation, design, construction traffic management and a preliminary green travel plan. The TIA has been prepared to meet the requirements of the SEARs issued for the project which states the following:

- ***Transport*** *– including:*

  - an assessment of the peak and average traffic generation, including over-dimensional vehicles, construction worker transportation and transport of materials by rail;

  - an assessment of the likely transport impacts to the site access route, site access point(s), any Crown land, particularly in relation to the capacity and condition of the roads, road safety and intersection performance;

  - a cumulative impact assessment of traffic from nearby developments; and

  - provide details of measures to mitigate and / or manage potential impacts including a schedule of all required road upgrades (including resulting from heavy vehicle and over mass / over dimensional traffic haulage routes), road maintenance contributions, and any other traffic control measures, developed in consultation with the relevant road authority.

6.7.1 Existing environment

Vehicular access to and from Tamworth is provided via Calala Lane along the northern boundary of the site. The BESS proposes to relocate the existing access driveway on Calala Lane further east and closer to the eastern site boundary.

The site will be operated remotely, and hence without permanent on-site staff, would generate very low traffic volumes as part of daily operations. Minor on-site parking would be provided for use by maintenance vehicles, as required.

Road Network

Consideration of the road network surrounding and leading to the site has been considered as part of the TIA.

Calala Lane is a single carriageway, two lane local road and is aligned in an east-west direction. One traffic lane is provided in each direction, set within an approximate 10-metre-wide carriageway with unsealed shoulders. Calala Lane has a posted speed limit of 100 kilometres per hour near the site.

Goonoo Goonoo Road is a state road and is aligned in a north-south direction to the west of the site. It is a two-way road configured with one traffic lane in each direction, set within an approximate 13-metre-wide carriageway. Informal unrestricted kerbside parking is mostly permitted on both sides of the road.

Goonoo Goonoo Road (New England Highway) is being upgraded to provide a duplication between Jack Smyth Drive and Calala Lane at the southern end of Tamworth. The duplication will address existing congestion, provide for future traffic growth, and improve road safety.

Specifically related to the proposed development, key features of the Goonoo Goonoo Road upgrade include Calala Lane intersection upgraded from a roundabout to signals, and road widening and pavement reconstruction to provide two traffic lanes in each direction with a central median between the area immediately north of Calala Lane, and Jack Smyth Drive.

Existing traffic conditions

The site is currently occupied by agricultural land uses and an existing residential dwelling. Traffic survey of the existing vehicular movements has been collected on Calala Lane, 400 metres west of Burgess Lane. Data was collected based on a seven-day tube count between 9 February and 3 March 2023.

The survey data collected indicates that there is an average of around 3,300 vehicles per day (two-way) over a seven-day period with approximately 1,700 vehicles eastbound and 1,600 vehicles westbound. Calala Lane currently carries a range of vehicles, including articulated vehicles and B-doubles on both weekdays and weekends. On average, heavy vehicles equate to 11 per cent of total traffic on weekdays and eight per cent on weekends, peaking at around 12 per cent on Tuesdays.

Peak weekday traffic volumes occur between 8:00am to 9:00am and 3:00pm to 4:00pm, corresponding with general commuter traffic patterns as well as school drop off and pick up periods. The site is located in close proximity of the Farrer Memorial Agricultural High School further east on Calala Lane. Around 370 (200 eastbound and 170 westbound) and 340 (155 eastbound and 185 westbound) vehicles travel along Calala Lane during the weekday AM and PM peak hours, respectively.

The technical reports prepared by Transport for NSW as part of the Goonoo Goonoo Road upgrade have been used in the TIA to understand the existing and future traffic volumes on Goonoo Goonoo Road. Goonoo Goonoo Road south of Calala Lane carried approximately 11,360 vehicles per day in 2020 and is expected to carry around 20,020 vehicles per day in 2030 following the completion of the upgrade. Up to 12 per cent of daily traffic volumes are heavy vehicles in both 2020 and 2030. This is

expected given Tamworth is strategically located midway between Brisbane and Sydney and plays an important role as an alternate freight route between the two cities, as well as generally servicing the freight movement associated with the surrounding mining industry.

6.7.2 Active and Public transport

The site is located in a rural area and there are limited formal walking or cycling facilities proximate to the site. A single bus route travels through Calala (route 436) that connects Calala with Tamworth Town Centre however the closest bus stops are located a minimum one-kilometre walk from site. An additional bus route is located further west of the site on Goonoo Goonoo Road, (route 435) which provides services throughout South and West Tamworth. Route 436 has seven services per day that travel along Calala Lane between 7:00am to 6:00pm.

Private vehicle is the predominant form of travel in the area with all vehicle access to/ from the site expected and considered appropriate.

6.7.3 Traffic generation

The site will be operated remotely therefore there will be no permanent on-site staff. Maintenance staff in the 99th percentile vehicles (cars, vans, utes) will be required to occasionally service the facility and hence the site is expected to generate low traffic volumes of up to a maximum of one to two vehicles per day. As such, the proposal is not expected to result in any change to traffic conditions in and around the site and the proposal could not be expected to compromise the safety or function of the surrounding road network.

With no permanent on-site staff only a minor quantum of on-site parking is required for use by maintenance vehicles as required. The car park layout and internal road network will be designed in accordance with the Australian Standard for Off Street Car Parking (AS/NZS2890.1:2004, AS2890.2:2018 and AS/NZS2890.6:2009), as well as Tamworth Regional Council Development Control Plan 2010.

6.7.4 Access arrangements

Vehicular access will be provided via a new access driveway on Calala Lane in the north-eastern corner of the site. Sight distance requirements for the proposed access location comply with the requirements of Austroads and AS 2890.Calala Lane is signposted as 100km per hour and the recommended sight distance at an unsignalised intersection is 248 metres based on a 2.0 second driver reaction time. The desirable minimum sight distances for a typical driveway are 39 metres and 222 metres respectively. Based on the significant sight distance in each direction on Calala Lane, the proposed site access arrangements are considered suitable as part of the proposed development.

6.7.5 Parking

As noted in Section 6.7.3, the proposed development will be remotely operated and therefore no permanent staff will be located on site. Vehicles driven by maintenance staff will be required to occasionally service the facility and is therefore expected to generate a very low number of vehicles – a total of one to two vehicles per day.

Dedicated parking bays are provided next to the control room, however maintenance vehicles may also park within the BESS footprint.

6.7.6 Construction traffic management

The TIA provides an assessment and consideration of the construction traffic impact associated with the proposed BESS. A detailed Traffic Management Plan (TMP) will be prepared prior to

commencement of construction of the BESS, however a summary of the proposed works, staging, site access arrangements, heavy vehicle movements and arrival and departure routes have been considered as part of the TIA and are discussed in this section of the EIS.

Construction timeline

The construction of the BESS is expected to continue for a period of at least 15 months. An overview of the construction timeline is provided in Figure 34 below which is an extract from the TIA.

Phase	Month														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Site mobilization															
Clearing of surface vegetation and installing security fences															
Benching of site															
Delivery of components and equipment															
Installation of components and commissioning															
Site rehabilitation, landscaping and vegetation works															
Site demobilization															

FIGURE 34 – CONSTRUCTION TIMELINE

Source: Stantec

Work is planned to be undertaken in accordance with the NSW Interim Construction Noise Guideline during the following hours:

- Monday to Friday: 7:00am to 6:00pm
- Saturday: 8:00am to 1:00pm
- Sundays and Public Holidays: No work

Construction workers

For the majority of the construction program, between five to 60 construction workers are expected on site each day. Peak activity is expected to occur over a four-month period, with between 110 and 140 construction workers expected on site per month.

Construction workers are expected to use accommodation available within Tamworth and the surrounds. Sufficient dedicated on-site worker parking will be provided, including formal on-site worker parking for 60 vehicles, with capacity for additional informal worker parking where required. Workers will be encouraged to carpool at all times to limit both vehicle movements and on-site parking demand where practical. No construction related vehicles will be permitted to park on public roads at any time. A drop-off and storage facility will be provided on-site for larger tools and equipment, which is noted on the plans as the laydown area. As such, the parking impacts associated with construction workers will be negligible.

Construction traffic generation

The main impact of the proposal will be through the construction of the BESS. The additional traffic generated during the construction period will generally be relatively minor compared to the existing daily traffic volumes along Goonoo Goonoo Road, however along Calala Lane, the proportional

increase in traffic as a result of the development is expected to be higher as a result of lower existing traffic volumes on the road network. Notwithstanding, it is not anticipated that the construction traffic volumes will result in significant adverse impact on the safety or function of the road network.

A summary of the anticipated increase in traffic in relation to the existing traffic data is provided in Table 33 below.

TABLE 33 – CONSTRUCTION TRAFFIC VOLUMES

ROAD	EXISTING DAILY TRAFFIC VOLUMES	ANTICIPATED AVERAGE INCREASE	
		TYPICAL AVERAGE TRAFFIC GENERATION (TWO WAY MOVEMENTS)	PEAK TRAFFIC GENERATION (TWO WAY MOVEMENTS)
Calala Lane	3,357	214 (6% increase)	848 (25% increase)
Goonoo Goonoo Road	11,364	214 (2% increase)	848 (7% increase)

It is noted that this assumes all development traffic will travel to and from the site in a westbound direction via Calala Lane and Goonoo Goonoo Road. In reality, some vehicle trips will travel in an eastbound direction via Calala Lane and O'Brien's Lane. Until a preferred construction contractor has been identified, it is currently not possible to accurately determine the origin-destination route that light and heavy vehicles will take during construction.

The construction of the BESS is expected to generate around 67 vehicles (one-way) per day, comprising around 60 light vehicles and seven trucks, during the peak construction period. These movements include deliveries of water to the site and all other components of construction. The peak construction period is assumed to last for 5 months. This is derived as follows:

- Peak traffic generation is approximately a 1-month period as described in Stantec traffic report at Table 6.3. This occurs in Month 2.

- Daily Construction Worker numbers peak over a 4-month period between months 3, 4, 5 & 6.

It is expected that during the peak one-month period, construction activity will result in up to 465 construction vehicles (one-way) per day, comprising around 85 light vehicles and 380 trucks. For the shoulder peak average traffic generation with a three-month period, the site is expected to generate an average of around 230 vehicles (one-way) per day, comprising 70 light vehicles and 160 trucks.

A breakdown of the anticipated traffic generation estimates by type of vehicle is provided in Table 34 below.

TABLE 34 – DAILY CONSTRUCTION TRAFFIC VOLUMES

TYPE OF VEHICLE	AVERAGE TRAFFIC GENERATION (VEHCILES PER DAY) 12 MONTH PERIOD	SHOULDER PEAK AVERAGE TRAFFIC GENERATION (VEHICLES PER DAY) 2 MONTH PERIOD	PEAK TRAFFIC GENNERATION (VEHICLES PER DAY) 1 MONTH PERIOD
Light Vehicles	60	70	85
Heavy Vehicles	7	160	380
Total Vehicles	67	230	465

Not included in the table above are an additional four (4) Over Size Over Mass (OSOM) vehicle movements which will occur across the project programme. These are discussed further below.

Peak movement from light vehicles will typically occur during construction worker arrival and departures around 7:00am and 5:00pm on weekdays. On average across the entire works period, around 30 to 50 light vehicle movements would be expected to arrive or depart the site around these times. Otherwise, for most of the construction programme (12 months), the site is expected to generate up to 10 vehicle movements per hour across the day. During peak construction activity, the site is expected to generate 60 to 80 vehicle movements per hour throughout the day.

With consideration of the above, Calala Lane is considered to operate an acceptable level of service of C or better throughout the construction period.

Construction vehicle access route

Heavy vehicle movements will be restricted to designated routes and confined to the State and Regional Roads, where practical and required. The approved routes for B-doubles as designated by Transport for NSW will also be considered.

The existing approved 26 metre B-double routes in the broader region are detailed on the NSW Load Carrying Network Map from Transport for NSW and are provided in Figure 35 below.

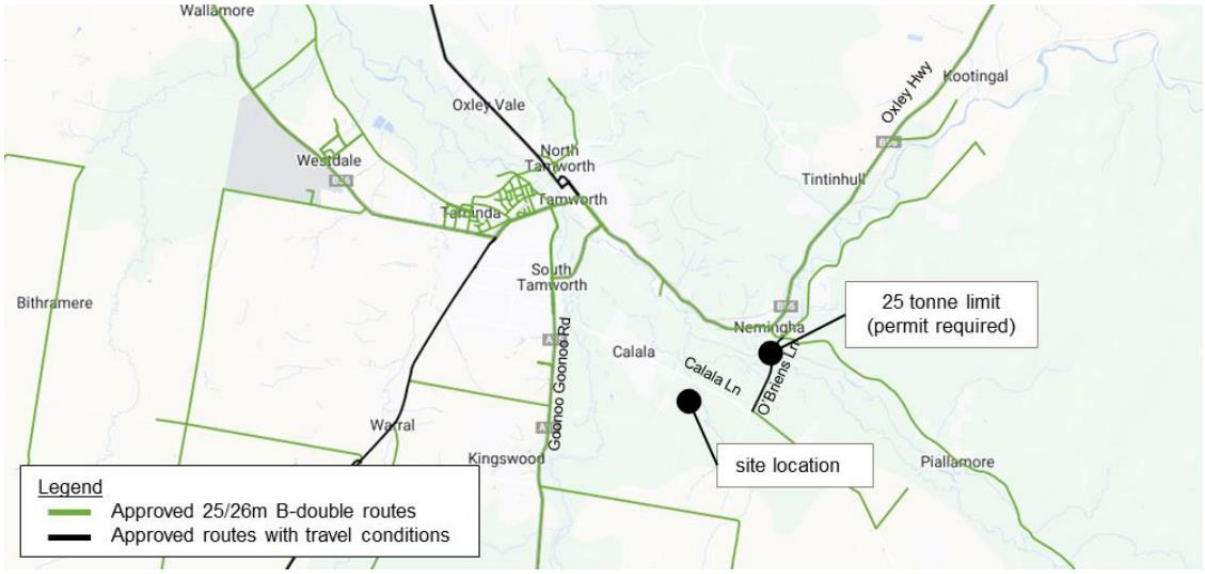


FIGURE 35 – B-DOUBLE APPROVED ROUTES

Source: Stantec

Goonoo Goonoo Road/ New England Highway and Oxley Highway near and on-route to the site are approved B-double routes. O'Brien's Lane up to the intersection at Loomberah Road is an approved route subject to obtaining a travel permit from Council due to the 25-tonne load limit. Calala Lane can currently accommodate B-doubles however is not formally designated as a Transport for NSW approved route.

Figure 36 below identifies the heavy vehicle routes to/ from the construction site, which have been identified with the aim of minimising the impact of construction traffic on the surrounding road network. Truck drivers will be advised of the designated heavy vehicle routes to and from the site. The directional distribution and assignment of traffic will be influenced by several factors, most notably the origin/ destination of materials, configuration of access points to the site, configuration of the arterial road network and the approved NSW B-double road network.

FIGURE 36 – CONSTRUCTION VEHICLE APPROACH AND DEPARTURE ROUTES

Source: Stantec

Over Size Over Mass vehicles (OSOM)

As identified above, the major components of the BESS will be required to be transported to the site by OSOM vehicles. The major components include the delivery of two 33/330kV transformers, the switchroom and the control room.

Transport of materials for the BESS via OSOM vehicles requires approval for use of the TfNSW and Council road networks. The TIA prepared by Stantec includes review of an OSOM vehicle route to ensure an appropriate route for OSOM vehicles can be provided. The OSOM route is subject to further review and finalisation following engagement of a contractor and subsequent preparation of a Transport Management Plan following SSDA approval.

The two OSOM vehicles transporting the BESS components are:

- 31.4m long EQUIS 9R8 and Dolly:
  - vehicle expected to transport two 330KV transformers – actual vehicle may be a smaller 21m vehicle, however EQUIS 9R8 tested to ensure assessment is suitably conservative.
  - with components loaded, combined vehicle and component height and width expected to be around 5.2m tall and 4.1m wide.
- 30.8m long EQUIS 8R8:
  - vehicle expected to transport the switchroom and control room to the site.
  - with component loaded, combined vehicle and component height and width expected to be around 5.3m tall and up to 4.3m wide (switch room is 4.2 metres wide, control room is 4.3 metres wide).

The route anticipated in the TIA is illustrated in Figure 37 below.

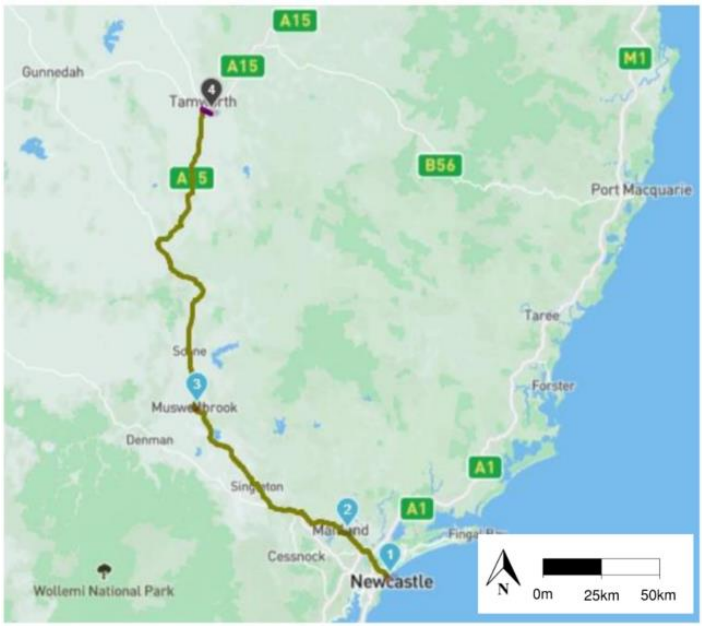


FIGURE 37 – OSOM VEHICLE ROUTES

Source: Stantec

The route proposes transport of the BESS components from the Port of Newcastle using the Hunter Expressway and New England Highway travelling via Singleton, Muswellbrook and Scone. The route has been planned using the Route Planner Tool from the National Heavy Rigid Vehicle Regulator and the NSW Load Carrying Network Map from TfNSW. As noted above, the route is subject to confirmation of items such as bridge heights, intersection/road widths and powerline clearances which will be undertaken as part of the detailed design stage with the TMP.

6.7.7 Mitigation measures

Mitigation and management measures recommended during the construction period are summarised in the table below:

TABLE 35 – TRAFFIC MITIGATION MEASURES

FACTOR	MANAGEMENT OF CONTROL MEASURE	RESPONSIBILITY	WHEN DOES THIS APPLY?
Permits/ Consent/ Licences	• Contractors will abide by the TMP to be developed post submission in consultation with all relevant stakeholders. • All construction will comply with requirements of Section 138 of the Roads Act 1993 'Works and Structures'. • The contractor will ensure that all traffic management approvals for works / traffic management arrangement along Local Roads associated with OSOM movements are obtained from the	Contractor	Throughout construction

	relevant Council prior to any work commencing. • The contractor will be responsible for obtaining all access permits and approvals under the National Heavy Vehicle Law and Regulations.		
Haulage	• The contractor will use an appropriately licensed haulage contractor for haulage of any items to site. The contractor will have experience in transporting similar loads and be responsible for obtaining all required approvals and permits from Transport for NSW or National Heavy Vehicle Regulator and Councils and for complying with conditions specified in the approvals. • All loaded vehicles entering or leaving site will have their loads covered or contained.	Contractor	During construction
Access point requirements	• Sight distance requirements will meet Austroads Guide. • Drag-out from vehicles onto the public road will be monitored. A tyre cleaning grid will be installed if needed. • Temporary truck signage will be installed, throughout the construction period.	Contractor	Throughout construction
Consultation	• Effective on-going consultation will be undertaken with relevant stakeholders during preparation of the TMP and throughout construction. • Liaison activities will occur with the community prior to and throughout construction.	Equis in conjunction with the contractor	Prior to, throughout and post-construction
Traffic control plans	• Any specific TGSs required will be developed by personnel duly qualified and certified by training in accordance with Traffic Control at Work Sites and prepared in consultation with Transport for NSW and local councils, as required.	Contractor	Pre-construction and as required during construction
Delays to traffic	• Construction trucks are to follow approved routes at all times.	Contractor	During construction

	• Light vehicles to always drive responsibility and consider other road users. This will be incorporated in the site induction. • Construction trucks' arrival and departure are to be planned with consideration to minimising effect to other road users during peak traffic periods.		
Safety of road users and construction staff	• Work is to be arranged so workers can undertake work safely, and where possible road users and workers are kept separated. • Place signs and devices before proceeding with works. • Ensure signs are not obscured by vegetation, vehicles, plant or other traffic control signs/ devices and that signs are placed in the correct order. • Where traffic controllers are required, they must be suitably qualified having passed Transport for NSW approved training courses. • Traffic controllers (or portable traffic signals if directing traffic to cross barrier lines) shall be used if road users are to be directed to disobey a traffic regulation. • All traffic controllers are to wear high visibility external clothing. • Signs, devices and TGSs shall be used to warn, inform and guide road users safely around, through or past work areas. • Signs, devices and TGSs are to be removed from the site upon completion of the work. • Specific TGSs will be prepared for all work which involves any form of traffic control or restriction. • An increased risk of rear end collisions arises in any location where road traffic is stopped for a period of time. Ensuring that there is sufficient warning to road users before encountering the queue is essential.	Contractor	During construction

	• Depending on the situation this may require extending the length of a sign posted roadwork speed zone in the development of the TGS, using oversized signs, flashing light signs and variable message signs.		
Driver's Code of Conduct	• An overview driver's Code of Conduct has been provided in Section 8. • The Code of Conduct will be revised by Equis Energy in conjunction with the contractor prior to commencement of on-site works for the project. • It is Equis Energy's expectation that the Code of Conduct will be implemented for all traffic and transport construction activities associated with construction.	Equis in conjunction with the contractor	During construction
School bus routes	• Details and times of school bus routes will form part of the site induction, so all drivers will be aware. • Consultation will occur and be ongoing with bus operators.	Equis in conjunction with the contractor	During construction

6.8 Bushfire

A Bushfire Assessment Report has been prepared by Building Code and Bushfire Hazard Solutions and is provided at Appendix S. The bushfire report has been prepared to meet the requirements of the SEARs issued for the project which states the following:

- ***Hazards*** *– including:*
  - *a preliminary risk screening completed in accordance with State Environmental Planning Policy No. 33 – Hazardous and Offensive Development and Applying SEPP 33 (DoP, 2011);*
  - *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 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*
  - *an assessment of potential hazards and risks including but not limited to bushfires, land contamination, 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.*

The bushfire report addresses the final point of the SEARs requirement above and identifies and assesses any potential impacts arising from bushfires. The report is informed by desktop investigation and a site visit. Key points from the report are outlined below.

6.8.1 Existing environment and impacts

The bushfire report considers the vegetation structure, connectivity and attributes surrounding the BESS site which are fundamental contributors to bushfire behaviour and its movement through the landscape. The bushfire report confirms the site is within the Northern Slopes Fire Weather District and is captured by the Tamworth Bush Fire Risk Management Plan 2020.

The subject site is identified as Category 3 Vegetation and Vegetation Buffer bushfire prone land on Tamworth Regional Council's Bushfire Prone Land Map and is therefore considered bushfire prone land as identified in Figure 38 below.

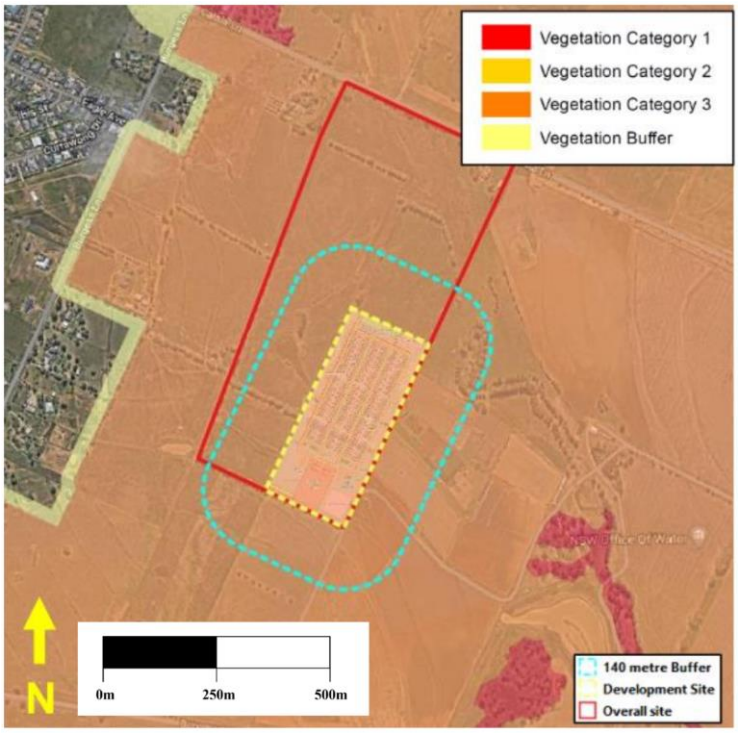


FIGURE 38 – BUSHFIRE PRONE LAND MAP OVERLAY

Source: Equis with markups by Building Code and Bushfire Hazard Solutions

As part of the bushfire assessment, consideration has been given to the potential for bushfire runs that currently exist into the site, as well as the potential fire behaviour and impacts from the retained vegetation within the site. The vegetation within the subject site and neighbouring allotments comprises of periodic management, crops and grazing. The vegetation in the broader landscape is similar to that of the subject property and neighbouring allotments.

In accordance with Appendix 1 'Site Assessment Methodology' of *Planning for Bushfire Protection 2019* (PBP), an assessment of all vegetation formations within 140 metres of the development site for each aspect has been undertaken. Due to the periodic management and as a conservative assessment for the purpose of PBP, the bushfire report provides an assessment of all lands outside the proposed development footprint to be Grassland hazards as shown in Figure 39 below.

FIGURE 39 – BUSHFIRE HAZARD PLAN

Source: Equis with markups by Building Code and Bushfire Hazard Solutions

The slope of the land has a direct influence on the forward rate of spread, fire intensity and radiant heat exposure. The slope of the site is determined in accordance with A1.4 'Determine slope' in PBP and is illustrated in Figure 40 below.

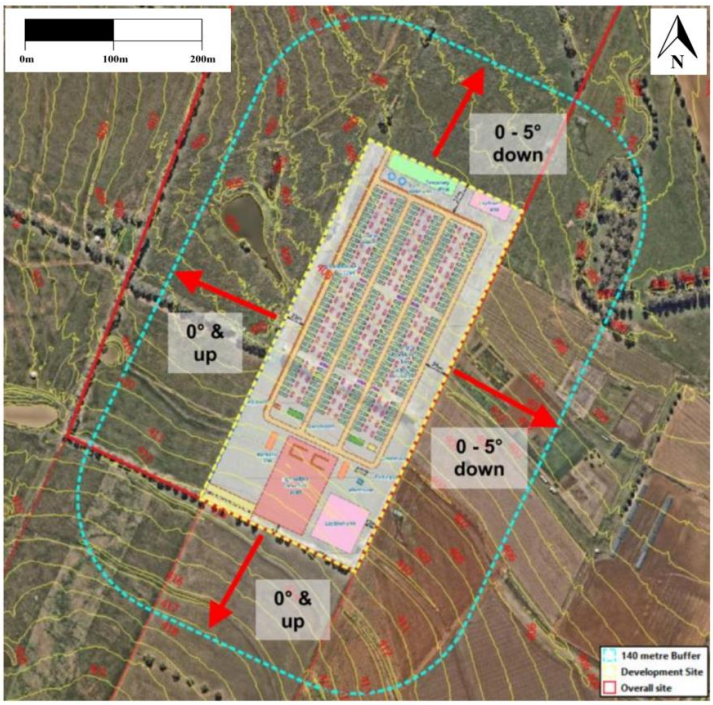


FIGURE 40 – SITE TOPOGRAPHY

Source: Equis with markups by Building Code and Bushfire Hazard Solutions

The PBP requires any development with an asset protection zone (APZ) to identify the relevant Fire Danger Index (FDI) which is used for development assessment purposes. In accordance with the NSW Rural Fire Service publication 'NSW Local Government Areas FDI' (2017), Tamworth Regional Council form part of the Greater Sydney Region Fire Weather District and attracts an FFDI of 80. As the identified hazard is grassland, Table 5.1.4a of PBP was used to determine a Grassland Fire Danger Index (GFDI) of 110.

Consideration of the fire history within the locality has been undertaken within the bushfire report. The report confirms the closest recorded wildfire was found to be located >8.5 kilometres to the northwest of the subject site which occurred during the 2006-2007 bushfire season.

The bushfire report also includes an extract from the Tamworth Bush Fire Risk Management Plan 2020 which confirms that the Tamworth area has on average 270 bush fires per year, of which 18 on average can be considered major fires. The main sources of ignition in the Tamworth area are:

- Lightning strikes
- Agricultural burns and practices
- Malicious fires
- Escaped pile burns
- Machinery and vehicle fires
- Welding, grinding and associated construction activities

Based on the above, the report considers the site to not be within a known fire path.

6.8.2 Mitigation

The bushfire report provides an assessment of the proposed development against the requirements of the PBP which is discussed in Section 6.8 above. This section of the EIS provides appropriate bushfire protection measures (BPMs) in accordance with Section 8.3.5 'Wind and solar farms' of PBP which outlines the specific BPMs applicable to the proposed development, including APZs, Access, Services & Emergency Management Plan. Whilst the proposal is not for a wind or solar farm, the mechanical components of the proposed BESS are similar to those of a wind or solar farm and can therefore be applied to the proposed development. The hazard associated with fire from a malfunction, explosion or similar are discussed at Section 6.10 with regard to the hazards identified in the Preliminary Hazard Analysis prepared by Sherpa.

The bushfire report includes the mitigation measures outlined below for the proposed development.

Asset Protection Zones

Section 8.3.5 'Wind and solar farms' of PBP requires a minimum APZ of 10m.

The proposed development provides an APZ of 37 metres to the north, 26 metres to the east, 10 metres to the south and 22 metres to the west.

The APZs meet the minimum required APZ in accordance with PBP.

Access

Access to the subject property is available from Calala Lane to the north. The proposed layout provides an access track around the battery enclosures.

The proposed access track satisfies the requirement of section 8.3.5 of PBP which requires road access to the site.

Attending fire appliances also have direct and comprehensive vehicle access to the identified hazards via the proposed access track.

The proposed access provisions are considered adequate to provide safe operational access for emergency service personnel in suppressing a grassfire, while persons are accessing or egressing the area.

Services – water, electricity and gas

The proposal includes two steel water tanks with a capacity of approximately.100,000 litres each.

These tanks will be fitted with a 65 mm storz fitting.

The proposed water supply is considered adequate for the replenishment of attending fire services.

Recommendations will be included to ensure compliance with any new electricity and gas services.

Bushfire Emergency Management and Operations Plan

Preparation of a Bushfire Emergency Management and Operations Plan including the following:

- detailed measures to prevent or mitigate fires igniting;
- work that should not be carried out during total fire bans;
- availability of fire-suppression equipment, access and water;
- storage and maintenance of fuels and other flammable materials;
- notification of the local NSW RFS Fire Control Centre for any works that have the potential to ignite surrounding vegetation, proposed to be carried out during a bush-fire fire danger period to ensure weather conditions are appropriate; and
- appropriate bush fire emergency management planning.

6.9 Water

A Water Management Report was prepared by Northrop in support of the EIS (refer to Appendix Q) in response to the SEARS requirements which state the following:

- ***Water – including:***
    - *an assessment of the likely impacts of the development (including flooding and groundwater contamination) on surface water and groundwater resources and measures proposed to monitor, reduce and mitigate these impacts;*
    - *details of water requirements and supply arrangements for construction and operation; and*
    - *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);*

The Water Management Report addresses the SEARs requirements above and identifies the likely impacts of the development on surface and groundwater, details of water supply arrangements, and a description of the erosion and sediment control measures that will be implemented to mitigate the impacts of erosion sediment runoff.

6.9.1 Existing environment

6.9.1.1 Climate and Hydrology

The site is situated in the Peel River catchment which flows generally to the northwest past Tamworth. The topography of the land at the site and upstream of the site have been significantly modified through

the installation of graded banks. These are installed as erosion control measures, typically on farms. They are formed by forming banks offset from the contour so that runoff is diverted to a stable feature such as a swale creek or dam.

The climate of the site is described as “sub-humid” with rainfall distribution being distributed most heavily in the summer. The annual rainfall in Tamworth is 667mm with December and January being the wettest months in the year.

6.9.1.2 Catchment analysis

The site flows into Calala Creek, which flows into the Calala Anabranch (approximately 5.8km downstream of the site), and which flows into the Peel River 2.2km further downstream. The Peel River is a major river system flowing into the Namoi River, which flows into the Baron River near Walgett. The entire waterway system forms part of the Murray Darling Basin.

Calala Creek is approximately 13 km in length and the site is located approximately at the halfway point of Calala Creek. An unnamed tributary flows into Calala Creek on the site, with a catchment area upstream of the site of approximately 80ha. This is the closest waterway to the proposed development site. The upstream catchment is small in area, owing to the presence of graded banks upstream of, and surrounding the site. The immediate catchment of the site is shown in Figure 41.

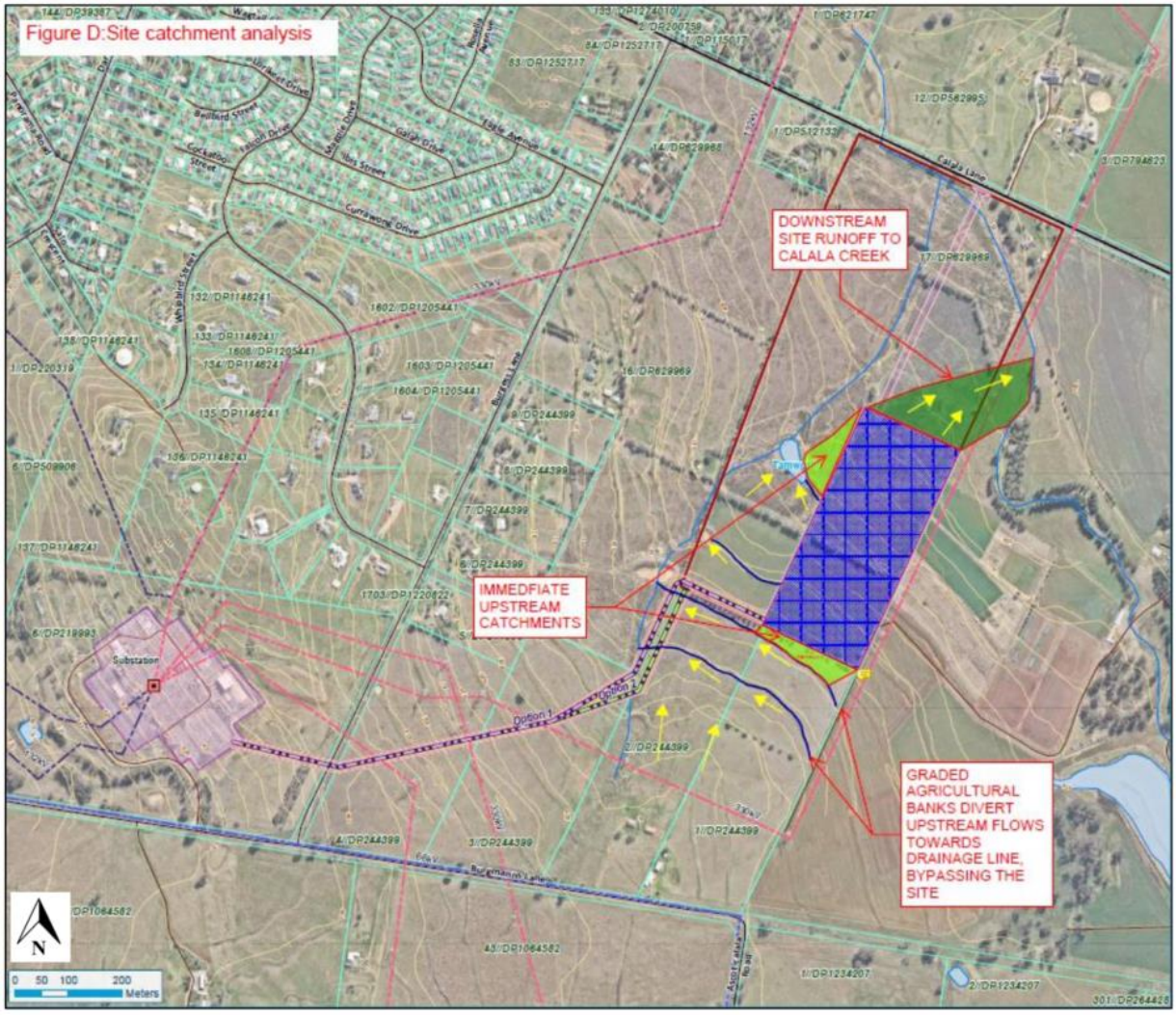


FIGURE 41 – SITE CATCHMENT ANALYSIS

Source: Northrop

6.9.1.3 Riparian corridors

There are two waterways on the site as shown in Figure 42 including the unnamed tributary line to the west of the proposed development, and Calala Creek to the east and north of the proposed development. The only encroachment created is where the road entrance from Calala Lane crosses over the Calala Creek channel in a culvert.

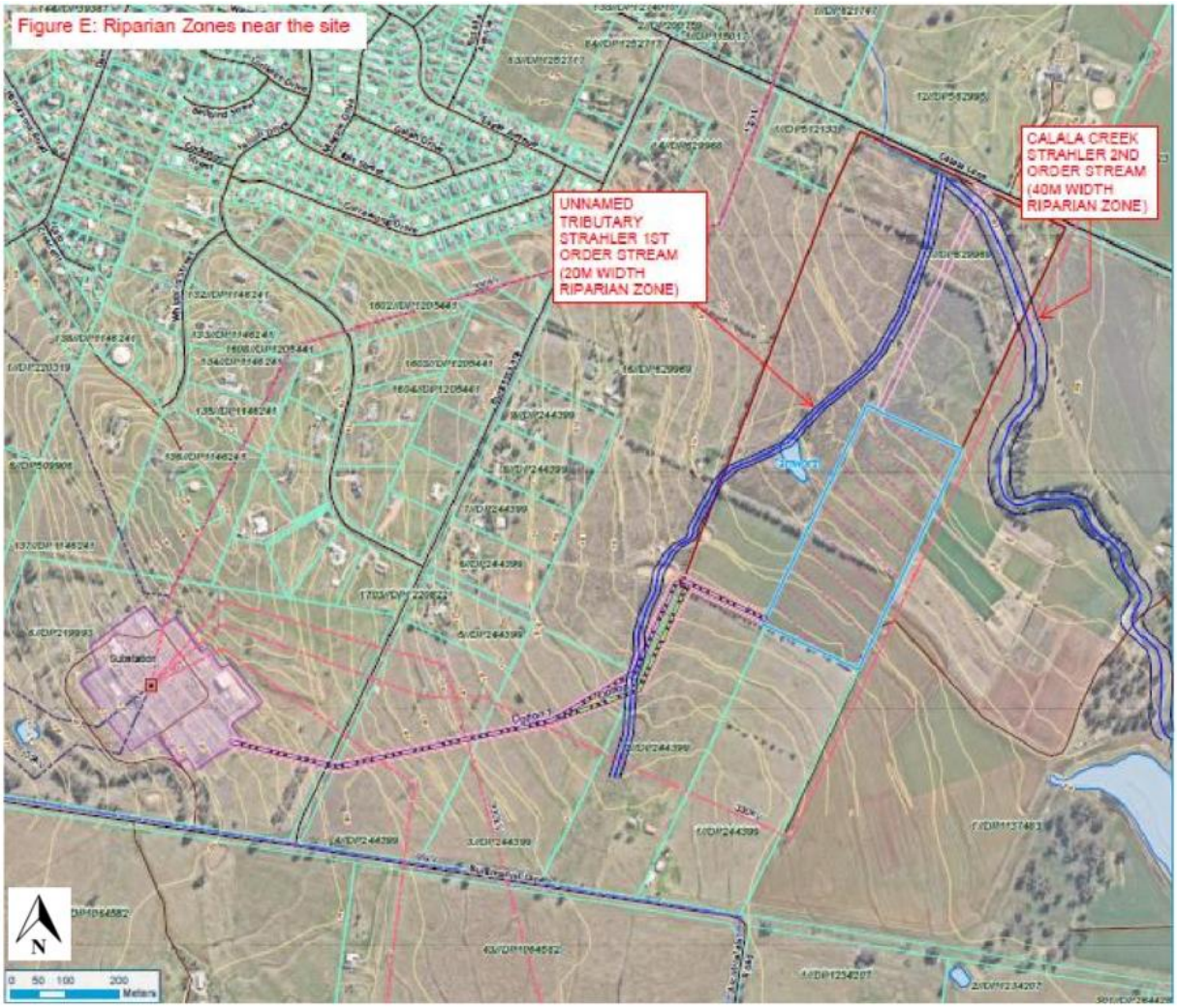


FIGURE 42 – RIPARIAN ZONES NEAR THE SITE

Source: Northrop

6.9.1.4 Water and sewer supply

There is no existing water supply or sewerage system available to the site. It is not proposed to connect to the main water or sewer system during the construction or operation of the facility.

During construction there will be three main demands for water i.e., construction workforce drinking water, dust suppression and concrete mixing. Additionally, a reservoir of water would be required in the event of any unlikely fire emergency.

Drinking and fire suppression water will be from a potable supply sourced from Tamworth Regional Council. The contractor will likely enter into an arrangement with Council to access/purchase water, likely from a hydrant in Calala. Water trucks would fill up and transfer the water into the tank storage on site. Water may be required on site for concrete mixing, however, the water required will be minimal as most will be premixed off site. For dust suppression, non-potable water would be the most suitable. The source of water for dust suppression will be confirmed at construction stage.

At the start of construction, the tank/s would be filled. Assuming that the maximum 85-strong workforce on site creates a demand of 10l/person/day, max 1kl per day of water would be required. This equates to one (10kl) water tanker movement per week to top up the tank/s.

Based on the above, the overall demand on water resources during construction is considered to be short-term and low in volume. Council's water supply can accommodate the demand for potable water for all of the construction needs. If bore or farm dam water is accessed for dust suppression this would alleviate the demands on Council's supply.

During the operational phase, the demand for water is only in the event of the fire suppression tanks being used in an unlikely emergency. Top-up of the tanks would be required in response to this scenario. This would be from Council's potable water supply.

6.9.1.5 Flooding

North of the site is the Peel River floodplain, which is the most significant floodplain in Tamworth. The site is situated outside of the Peel River floodplain, but is partially affected by the Calala Creek floodplain, as confirmed by the *Tamworth City-wide Flooding Investigation*. However, Figure 43 demonstrates that the proposed development is situated outside of the 1% annual exceedance probability and the probable maximum flood. Moreover, the development site will be raised by an earthworks pad. As such, flooding is highly unlikely to impact the development site. However, flooding from Calala Creek may impact the access road to the development site.

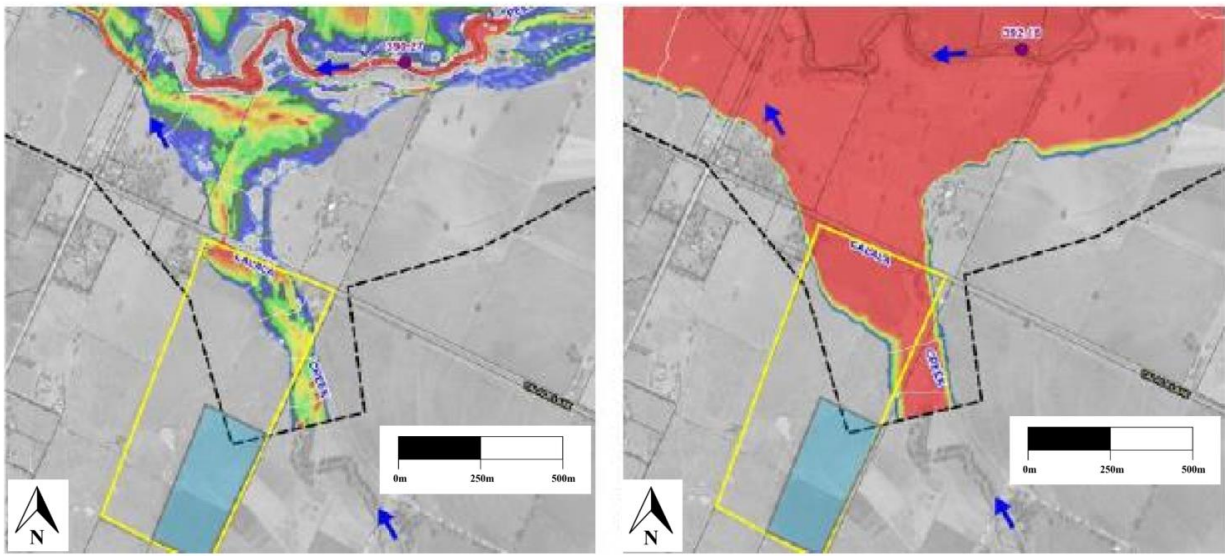


FIGURE 43 – 1% AEP (LHS) AND PROBABLE MAXIMUM FLOOD EXTENTS IN RELATION TO THE PROPERTY (YELLOW SHAPE) AND THE PROJECT SITE (AQUA SHAPE)

Source: Northrop

6.9.1.6 Groundwater

The development site is situated on the edge of the Peel Regulated River Alluvium Management Zone. The groundwater in this zone is renewed by rainfall infiltration, river leakage, and some side slope seepage. The groundwater levels are significantly influenced by flood events. The two dominant aquifer types include alluvial aquifers and fractured rock aquifers. Alluvial aquifers occur along valley floors associated with rivers and creeks (such as Calala Creek) whereas the fractured rock aquifers form the valley slopes, the hills and ranges and cover most of the catchment. The general direction of groundwater flow in the alluvials is parallel to the direction of the waterway.

The Water Management report states that following conclusions can be made about the Peel catchment groundwater sources:

- *The alluvial aquifers of the Peel catchment are highly connected to the surface water system.*
- *The regulated Peel River loses water to the groundwater over most of its length. The smaller tributaries are largely ephemeral. The larger tributaries of the Cockburn River and the Goonoo Goonoo Creek are largely perennial.*
- *Groundwater usage has historically been considerably less than entitlement levels.*
- *Groundwater level fluctuations reflect seasonal conditions and stream flow conditions and there is no evidence that the current levels of pumping are causing long term declining groundwater levels.*
- *Groundwater levels recover quickly after the return of good seasonal conditions.*

6.9.2 Impacts

6.9.2.1 Construction

The primary water-related impacts that are anticipated to arise from construction are erosion and sediment deposition. Erosion may occur in areas of cleared land but is anticipated to occur with greater frequency in creating the pad and trenching. Moreover, the access road over Calala Creek will include the installation of a culvert, which is anticipated to have the potential to cause erosion of the creek channel. Erosion impact would affect downstream ecosystems, where sediment smothers aquatic habitats and nutrients facilitate the growth of algae which can bloom in waterways.

6.9.2.2 Operation

The key impact of the operation is stormwater runoff management. In the case of ruptured batteries, the contents of the batteries may be exposed to the environment and waterways. The most likely instance of this occurring is in the event of a fire where firefighting efforts involve water, and subsequently, heavy metals would be mobilised in the water to the downstream basin. However, it is noted that the probability of this circumstance occurring is negligible.

6.9.2.3 Decommissioning

The decommissioning of the facility is anticipated to include the demolition/recovery of all batteries and electrical equipment as well as the removal of the earthworks pad. The primary impact is water erosion, as discussed in Section 6.9.2 of this EIS.

6.9.3 Mitigation

6.9.3.1 Construction

The primary water-related impacts that are anticipated to arise from construction are erosion and sediment deposition. Protection of downstream waterways is required to prevent sediment from entering aquatic ecosystems. The proposed erosion and sediment controls contained in Appendix G for the site include:

- *Diversion of clean run-on waters from upslope using swales to directs flows to stable discharge points.*
- *Sediment fences to filter sediment from runoff.*
- *Hay bales to create check dams in swales, as required (may substitute sediment fences)*
- *Basins to capture and contain runoff such that sediment can settle out prior to runoff leaving the basin.*
- *Swales and level spreaders to train basin discharge in a stable manner and to provide some filtering.*

All erosion and sediment control measures must be designed and installed in accordance with the *Managing Urban Stormwater: Soils and Construction* authorised by Landcom in 2004 and with the civil engineering concept plan contained in Appendix G. The erosion and sediment control measures are to be inspected weekly and cleaned out by removing accumulated sediment.

6.9.3.2 Operation

The operation of the development will manage the impacts of sediment, primarily generated by the unsealed gravel access roads. The basins installed during the construction phase will be cleaned and modified for operational use and are anticipated to effectively remove most of the sediment that would otherwise enter the waterways. The overflow from the basins will then enter a swale or level spreader which would further remove sedimentation before the runoff enters the waterways.

6.9.3.3 Emergency Operation

In the unlikely event of a fire emergency that results in the rupturing of a battery, the water stored within the firefighting water tanks will be used for firefighting efforts. Should this occur, the contents of the battery (including heavy metals) are likely to leak out and be flushed out with the water used for firefighting, which would then enter the basin. If the basin is at a low water level, it would capture much of the contaminated water and the associated heavy metals. In the event the basin is full, the firefighting water will overflow but the heavy metals will likely be contained within the basin. The basin will be adequately sealed to protect the groundwater underneath.

If this situation were to occur, the removal of the contents of the basin would need to occur and be treated as a contamination incident. As such, the basin water would be pumped out into tankers and removed for treatment and disposal. Finally, the upper 100mm of the base of the basin would need to be removed for remediation or disposal.

However, the likelihood of a fire occurring at the development is ‘rare’ and carries a ‘very low’ risk rating, as confirmed by the Preliminary Hazard Analysis contained in Appendix R. The Wastewater Management Report states that “the probability of a fire occurring and causing a rupture and leakage is so low as to suggest that no specific controls are required to capture heavy metals contained in fire suppression water”.

6.9.3.4 Flooding and riparian

The access road to the development site is affected by the Calala Creek floodplain. As such, a culvert crossing is designed to accommodate Calala Creek to the probable maximum flood and the potential erosion and sediment impacts. The CAA application will require sufficient detail with regard to hydraulic calculations and erosion and sediment controls.

6.9.3.5 Dust suppression

The site has potential to generate wind-blown dust. Water will be used by water carts on site to control dust generation, as required.

6.9.3.6 Sewage management

No effluent will be generated at the BESS, and therefore no effluent management system is proposed. Temporary toilets will be provided for construction phase with their contents removed and managed by a sub-contractor. During operations, no on-site sewage system is proposed for the site.

6.10 Hazards

A Preliminary Hazard Analysis (PHA) has been prepared by Sherpa Consulting in response to the SEARS requirements which state the following:

- ***Hazards*** *– including:*

    - *a preliminary risk screening completed in accordance with State Environmental Planning Policy No. 33 – Hazardous and Offensive Development and Applying SEPP 33 (DoP, 2011);*

    - *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 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*

    - *an assessment of potential hazards and risks including but not limited to bushfires, land contamination, 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;*

The PHA addresses the SEARs requirements above and includes a preliminary risk screening completed in accordance with *the State Environmental Planning Policy No. 33 – Hazardous and Offensive Development*[1] (*SEPP 33*), the guidance document *Applying SEPP 33*, and the *Hazardous Industry Planning Advisory Paper (HIPAP) No. 6 Hazard Analysis and Multi-Level Risk Assessment*. The scope of hazards considered as part of the PHA include bushfires, land contamination, spontaneous ignition, and electromagnetic fields.

A preliminary risk screening was undertaking to determine whether the development is classified as 'potentially hazardous' for the purposes of the *State Environmental Planning Policy (Reslience and Hazards) 2021*. The preliminary risk screening found that the project is not 'potentially hazardous' because:

- The storage and transport of hazardous materials for the project will not exceed the relevant risk screening threshold.

- There are no other risk factors identified that could result in significant off-site impacts.

- The project is not considered as 'potentially hazardous' with respect to DG storage and transportation and does not require a PHA.

However, to address the requirements of the SEARs, both a PHA and an assessment of hazards and risks for the project have been prepared.

In addition to the above, the application is supported by a Preliminary Site Investigation (PSI) prepared by ENV Solutions. The PSI is in response to the SEARs which requires consideration of the contamination status of the site which is discussed in further detail below.

[1] *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development* has been repealed and superseded by *State Environmental Planning Policy (Resilience and Hazards) 2021*. The relevant provisions of SEPP 33 have been incorporated into Chapter 3 of the Resilience and Hazards SEPP, however, the guidance document *Applying SEPP 33* still applies.

6.10.1 Existing environment

The project will occupy an area of approximately 8.9ha within the existing rural landholding. The subject site is situated on rural land zoned RU4 Primary Production Small Lots, and the land along the proposed transmission line easement and substation are also zoned RU4. There are 78 residences within 1km of the project, principally located in between 500m and 1km in 'clusters' to the west of the subject site. There are 2 non-associated dwellings (R2 and R9) within 500m of the project, meaning the owners are not included in a land agreement with Equis; the closest is approximately 443m from the project boundary extent. Non-associated dwellings are considered to be sensitive receptors for the purpose of the PHA.

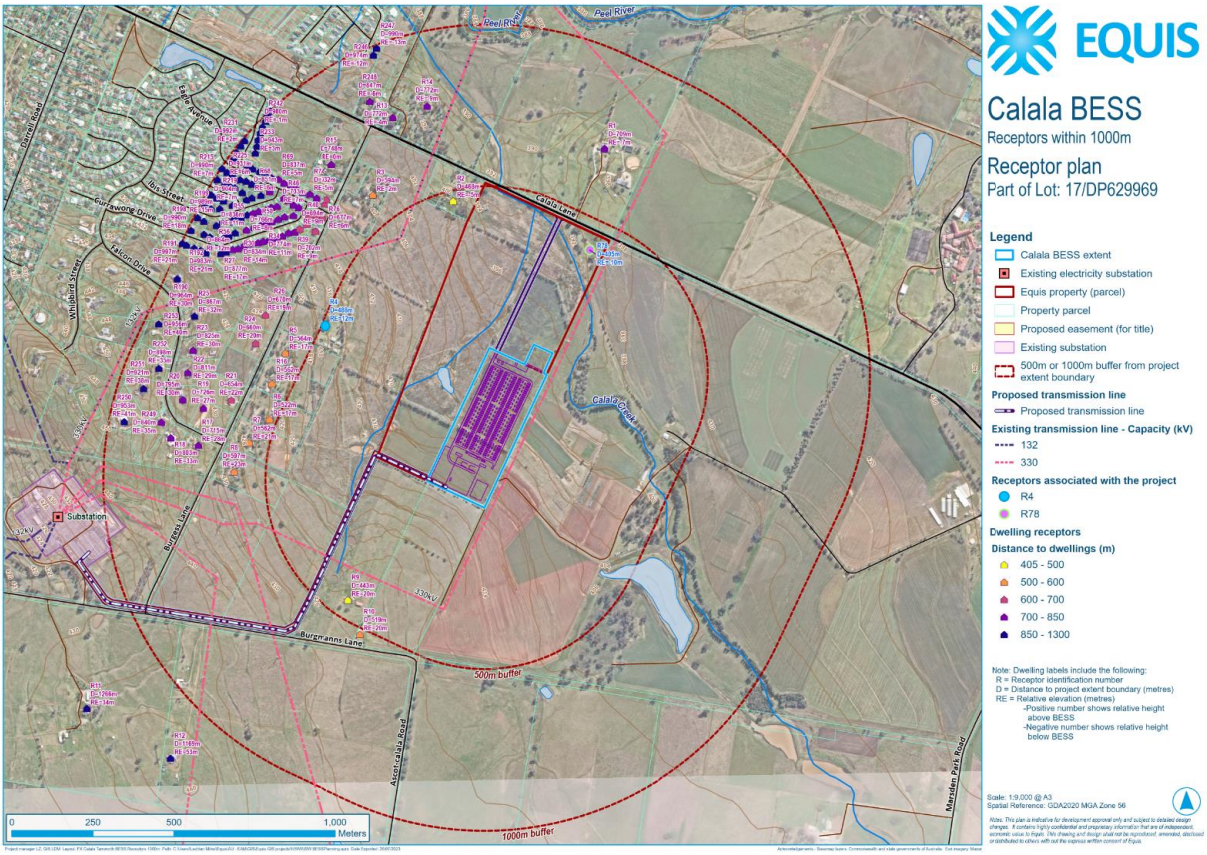


FIGURE 44 – RECEPTORS PLAN

Source: Equis

6.10.2 Potential Impacts

The PHA considers operation of the BESS and its risk to surrounding land uses. It was prepared in accordance with the methodology specified in HIPAP No. 6 Guidelines for Hazard Analysis and includes the following steps:

1. Establishment of the study context.
2. Identification of hazards resulting from the project operations and events with the potential for off-site impact (Hazard Identification).
3. Analysis of the severity of the consequences for the identified events with off-site impact, e.g. fires and explosions (Consequence Analysis).
4. Determination of the level of analysis and risk assessment criteria.
5. Analysis of the risk of the identified events with off-site impact (Risk Analysis).
6. Assessment of the estimated risks from identified events against risk criteria to determine acceptability (Risk Assessment).

The hazards and associated events considered were informed by AS/NZA 5139 and are summarised in Table 36.

TABLE 36 – IDENTIFIED HAZARDS AND EVENTS

HAZARD	EVENT
Electrical	Exposure to voltage
Arc flash	Release of energy
Fire	Infrastructure fire
Chemical	Release of hazardous materials
Explosive gas	Generation of explosive gas
Reaction	Battery thermal runaway
EMF	Exposure to Electric and Magnetic Fields (EMF)
External factors	Unauthorised access/trespasser. Lightning storm, water ingress (rain and flood)

The Hazard Identification (HAZID) in the PHA found that “for all identified events the resulting consequences are not expected to have significant off-site impacts (serious injury and/or fatality to the public or off-site population)” because the project is situated in a rural area and the nearest sensitive receptor is approximately 443 from the BESS. Details of the identified hazards, the events in which they could occur, and their consequences are briefly summarised below.

6.10.2.1 Electrical

An electrical hazard could arise in the event of exposure to voltage as a result of short circuits or electrical connection failures. This could result in electrocution, injury or fatalities to onsite employees and members of the public through touch or step potential (such as through fences).

The BESS is located in a rural area with significant separation between sensitive receptors, and as such, this hazard does not present a significant off-site impact. The risk rating for off-site and public impacts of this hazard is identified as “very low”.

6.10.2.2 Energy

An energy hazard could arise in the event of an arc flash as a result of incorrect procedure, faulty equipment, faulty design, damage, and other reasons. The consequences of this include arc blasts, fires, burns, exposure to intense light and noise, injury or fatality to onsite employees. The effects are localised and do not present off-site impacts and accordingly, the risk rating for off-site and public impacts of this hazard is identified as “very low”.

6.10.2.1 Fire

A fire hazard could arise in the event of a BESS fire, transformer/HV connection asset fire, or a bushfire as a result of faulty equipment, arc flash, mechanical damage, external fires, battery overhearing, or an oil leak, among other possibilities. The consequences may include the release of toxic or explosive material, an escalation of the fire to the entire BESS, or injury or fatality to onsite employees.

The BESS is located in a rural area with significant separation between sensitive receptors, and as such, this hazard does not present a significant off-site impact. The risk rating for off-site and public impacts of this hazard is therefore identified as “very low”.

6.10.2.2 Chemical

A chemical hazard can result in the release of electrolyte (liquid/vented gas) from the battery cell or BESS coolant/refrigerant leak as a result of mechanical damage, abnormal temperatures, or incorrection maintenance. The consequences of these events include release of flammable materials, release of vented gas, release of toxic materials, injury or fatality to onsite employees, ingress of coolant/refrigerant leading to short circuit, thermal runaway, and fire or explosion.

The BESS is located in a rural area with significant separation between sensitive receptors, and as such, this hazard is unlikely to have off-site impacts. The risk rating for this hazard is identified as “very low”.

6.10.2.3 Explosive Gas

An explosive gas hazard could arise in the event of generation of explosive gas (such as hydrogen) caused by a thermal runaway, bushfire, or other external fire. This could result in fire, explosion, release of toxic materials, injury or fatality to onsite employees.

The BESS is located in a rural area with significant separation between sensitive receptors, and as such, this hazard is unlikely to have off-site impacts. The risk rating for this hazard is identified as “very low”.

6.10.2.4 Reaction

A reaction hazard could arise in the event of thermal runaway in a battery caused by elevated temperatures (fire), electrical failure, mechanical failure, or system failure. This could result in fire, explosion, escalation to the entire BESS, injury or fatality to onsite employees.

The BESS is located in a rural area with significant separation between sensitive receptors, and as such, this hazard is unlikely to have off-site impacts. The risk rating for this hazard is identified as “very low”.

6.10.2.5 EMF

An EMF hazard could arise in the event of exposure to electric and magnetic fields caused by the operation of energy storage system and associated equipment This could result in high levels of exposure that impact the function of the nervous system and injury to onsite employees. However, the EMF created from the BESS will not exceed the acceptable level of exposure to the general public. Moreover, the strength of the EMF attenuates rapidly with distance from the BESS.

The BESS is located in a rural area with significant separation between sensitive receptors, and as such, this hazard is unlikely to have off-site impacts. The risk rating for this hazard is identified as “very low”.

6.10.2.6 External Factors

External factors hazards could arise in the event of water ingress, vandalism, and lightning strikes. These hazards could be caused by rain, flood, unauthorised access, deliberate damage to the BESS, or a lightning storm. This could result in electrical faults, fire, injury or fatality to onsite employees, asset damage, and dangers to trespassers (such as electrocution). The consequences of the hazards are generally local and will not result in off-site impact because the hazard is significantly separated from sensitive receptors. However, in the event of trespassing, the consequences of hazards could affect a member of the public. Nonetheless, it would occur onsite and would not have an off-site impact.

The BESS is located in a rural area with significant separation between sensitive receptors, and as such, this hazard is unlikely to have off-site impacts. The risk rating for the water ingress and lightning

strike hazards are identified as “very low”. However, the risk rating for vandalism is identified as “medium” because the severity is “major” and the likelihood is “unlikely”.

6.10.3 Mitigation

The HAZID identifies control measures to reduce the likelihood of the occurrence of consequences associated with the hazards considered. The following subsections will outline the control measures proposed.

6.10.3.1 Electrical

The BESS is located in a rural area with significant separation between sensitive receptors, and as such, this hazard is unlikely to have off-site impacts. The off-site and public impact risk rating for electrical hazard is identified as “very low” because the severity is “insignificant” and the likelihood is “rare”. Nevertheless, the following mitigation control measures will be implemented.

Design and Compliance to Standards: The design of equipment and systems will be designed and tested to comply with the relevant international and Australian standards (such as AS/NZS 5139).

Decisive Voltage Classification (DVC) and Signage: The BESS facility will accord with the DVC, meaning that equipment will be marked according to voltage levels and appropriate warning signs will be installed throughout the site. This will help to alert personnel to potential electrical hazards and arc flash risks.

Trained Personnel and Contractors: Installation, operations, and maintenance activities will be undertaken by qualified and trained personnel following all relevant site and safety procedures. Reputable contractors with a known commitment to safety will be engaged for additional assurance. Their practices will be confirmed by independent owner’s engineers to ensure the safety standards are met.

Site Induction and Training: A comprehensive site induction and recurring training sessions will be provided to all staff members, focusing heavily on those working in high voltage areas. The personnel will be made familiar with electrical switch-in and switch-out protocols, contributing to the overall safety on-site.

Fault Detection and Safety Measures: The BESS equipment will incorporate fault detection systems and a safety shut-off mechanism. In case an electrical fault is detected, the system will shut off, preventing the escalation of any hazard.

Earthing Study and Implementation: An earthing study will be undertaken to mitigate touch and step potentials, thus reducing the risk of electrical shock. The implementation of earthing will be carried out in line with the recommendations of the study, manufacturer’s instructions, and standards requirements.

Physical Barriers and Emergency Response: The facility will be safeguarded by a perimeter fence, displaying clear signage warning of the electrical hazard. This will discourage trespassers and accidental exposure to electrical equipment. An Emergency Response Plan will be established, including external firefighting protocols in conjunction with FRNSW & RFS.

Personal Protective Equipment (PPE) and Rescue Kits: Personnel will use appropriate PPE to protect them from potential electrical risks. Additionally, rescue kits, including insulated hooks, will be made available on-site for use in case of emergencies.

6.10.3.2 Energy

The BESS is located in a rural area with significant separation between sensitive receptors, and as such, the energy hazard is unlikely to have off-site impacts. The off-site and public impact risk rating for this hazard is identified as “very low” because the severity is “insignificant” and the likelihood is “rare”. Nevertheless, the following mitigation control measures will be implemented.

Design and Compliance to Standards: The design of equipment and systems will be designed and tested to comply with the relevant international and Australian standards (such as AS/NZS 5139).

Warning Signs: To alert personnel about the potential for arc flash, warning signs will be installed to delineate the arc flash boundary.

Trained Personnel and Contractors: Installation, operations, and maintenance activities will be undertaken by qualified and trained personnel following all relevant site and safety procedures. Reputable contractors with a known commitment to safety will be engaged for additional assurance. Their practices will be confirmed by independent owner’s engineers to ensure the safety standards are met.

Site Induction and Training: A comprehensive site induction and recurring training sessions will be provided to all staff members, focusing heavily on those working in high voltage areas. They will be made familiar with protocols such as de-energising equipment during maintenance and electrical switch-in and switch-out, contributing to the overall site safety.

Preventative Maintenance: The facility will adhere to a preventative maintenance schedule that includes regular checks and upkeep of insulation to reduce the risk of arc flash.

BESS Configurations and Fault Detection: To minimise fire escalation, the BESS configurations will maintain the clearances required by the manufacturer and/or applicable standards. Additionally, BESS equipment will feature fault detection and shut-off functions to address any detected electrical faults.

Fire and Explosion Protection System: The BESS facility will be equipped with a fire and explosion protection system, featuring battery system-specific features which may include a 60 minute-enclosure wall fire rating, gas-detection, fire-detection, and a roof-mounted deflagration panel.

Emergency Response: An Emergency Response Plan will be established, including external firefighting protocols in conjunction with FRNSW & RFS. This plan will be regularly reviewed and updated.

Personal Protective Equipment (PPE) and Rescue Kits: Personnel will use appropriate PPE to protect them from potential flash hazards within the arc flash boundary. Additionally, conductive items such as rings and jewellery will not be worn while working on or near energised or live conductive parts.

6.10.3.3 Fire

The BESS is located in a rural area with significant separation between sensitive receptors, and as such, the fire hazard is unlikely to have off-site impacts. The off-site and public impact risk rating for the fire hazard is identified as “very low” because the severity is “insignificant” and the likelihood is “rare”. Nevertheless, the following mitigation control measures will be implemented.

Design and Compliance to Standards: The equipment and systems in place will be designed and thoroughly tested to adhere to relevant international and/or Australian standards, such as AS/NZS 5139. This measure ensures that fire safety is considered in the design of equipment.

Procurement from Reputable Suppliers: Equipment will be sourced from reputable suppliers, ensuring high-quality and reliable components that are less likely to malfunction and potentially cause fires.

Trained Personnel and Contractors: Installation, operations, and maintenance activities will be undertaken by qualified and trained personnel following all relevant site and safety procedures. Reputable contractors with a known commitment to safety will be engaged for additional assurance.

Compliance with TransGrid's Requirements: All relevant TransGrid's requirements for the HV connection asset (33/330 kV switchyard) will be adhered to. Circuit breakers will be provided for the HV connection asset to prevent electrical overloads and subsequent fires.

BESS Configuration and Clearance: The BESS configurations will adhere to specified clearances required by the manufacturer and/or applicable standards. This will minimise the risk of fire spreading between the BESS sub-units and onto other adjacent infrastructure.

Preventative Maintenance: A proactive preventative maintenance procedure will be implemented, which includes insulation checks and replacement of faulty equipment. This will help in identifying potential fire hazards before they can cause a fire.

Fault Detection and Shut-off Function: BESS equipment will be equipped with a fault detection and shut-off function. This feature will shut down the system when a fault is detected, preventing it from escalating into a fire. An emergency shutdown procedure will be established, allowing for the immediate cessation of all operations in case of a fire, thereby minimising the potential for fire spread.

Fire and Explosion Protection System: The BESS will include a fire and explosion protection system, consisting of battery system-specific features. This system will effectively detect and suppress fires, reducing the risk of extensive fire damage.

Fire Management and Emergency Response Plans: A comprehensive Fire Management Plan and Emergency Response Plan will be developed, which will include establishing a defendable fire-fighting boundary and external firefighting protocols in conjunction with FRNSW & RFS. An APZ buffer will be included to minimise bushfire encroachment. The plans will be regularly reviewed and updated.

6.10.3.4 Chemical

The BESS is located in a rural area with significant separation between sensitive receptors, and as such, the chemical hazard is unlikely to have off-site impacts. The off-site and public impact risk rating for the chemical hazard is identified as "very low" because the severity is "insignificant" and the likelihood is "unlikely". Nevertheless, the following mitigation control measures will be implemented.

Design and Compliance to Standards: The equipment and systems in place will be designed and thoroughly tested to adhere to relevant international and/or Australian standards. This ensures that chemical handling and storage meet industry best practices.

Procurement from Reputable Suppliers: All chemical-related equipment will be sourced from reputable suppliers, assuring quality and reliability.

Trained Personnel and Contractors: Installation, operations, and maintenance activities will be undertaken by qualified and trained personnel following all relevant site and safety procedures, reducing the likelihood of mishandling of chemicals.

Encasement of Battery Cells and Modules: Battery cells and modules will be enclosed within external casing to prevent unintentional exposure to hazardous chemicals.

Spill Cleanup Protocols: In the event of a spill, cleanup using dry absorbent material will be implemented promptly to contain and neutralise the spill, minimising the risk to personnel and the environment.

BESS Configuration and Clearance: The BESS configurations will adhere to specific clearances required by the manufacturer and/or applicable standards. This minimises the chance of fire spreading between BESS sub-units and other adjacent infrastructure.

Fault Detection and Shut-off Function: A fault detection and shut-off function for BESS equipment will be utilised, allowing for immediate response to any chemical-related equipment malfunction. An emergency shutdown procedure will be established, allowing for the immediate cessation of all operations in the event of a chemical emergency, thereby reducing further risks.

Fault Detection and Shut-off Function: BESS equipment will be equipped with a fault detection and shut-off function. This feature will shut down the system when a fault is detected, preventing it from escalating into a fire. An emergency shutdown procedure will be established, allowing for the immediate cessation of all operations in case of a fire, thereby minimising the potential for fire spread.

Fire and Explosion Protection System: The BESS will include a fire and explosion protection system, consisting of battery system-specific features. This system will effectively detect and suppress fires, reducing the risk of extensive fire damage.

Fire Management and Emergency Response Plans: A comprehensive Fire Management Plan and Emergency Response Plan will be developed, ensuring that strategies are in place to manage chemical fires and other emergencies. This will include external firefighting protocols in conjunction with FRNSW & RFS. The plans will be regularly reviewed and updated. Moreover, an Asset Protection Zone (APZ) buffer will be implemented to minimise bushfire encroachment, which could cause chemical fires.

6.10.3.5 Explosive Gas

The BESS is located in a rural area with significant separation between sensitive receptors, and as such, the explosive gas hazard is unlikely to have off-site impacts. The off-site and public impact risk rating for the explosive gas hazard is identified as “very low” because the severity is “insignificant” and the likelihood is “rare”. Nevertheless, the following mitigation control measures will be implemented.

Design and Compliance to Standards: All equipment and systems will be crafted and rigorously tested to meet the applicable international and Australian standards (such as NFPA 68) and guidelines.

Procurement from Reputable Suppliers: Equipment will be sourced from reputable suppliers to ensure adherence to necessary safety and quality standards.

Independent Owner’s Engineer Endorsement: The BESS facility will be validated through the endorsement of an independent owner’s engineer.

Trained Personnel and Contractors: Installation, operations, and maintenance activities will be undertaken by qualified and trained personnel following all relevant site and safety procedures, reducing the likelihood of mishandling of chemicals.

BESS Configuration: To minimise fire escalation, the BESS configurations will maintain the clearances required by the manufacturer and/or applicable standards.

Ventilation: The manufacturer’s instructions for ventilation will be implemented to provide necessary airflow to prevent gas build-up and potential explosion.

Fault Detection and Shut-off Function: BESS equipment will incorporate fault detection and shut-off functions to allow rapid response to any malfunctions that could lead to gas release. A procedure for emergency shutdown will be implemented to stop operations if an explosive gas hazard is detected.

Fire and Explosion Protection System: The BESS will include a fire and explosion protection system, consisting of battery system-specific features.

Fire Management and Emergency Response Plans: A comprehensive Fire Management Plan and Emergency Response Plan will be developed, which will include establishing a defendable fire-fighting boundary and external firefighting protocols in conjunction with FRNSW & RFS, to effectively respond

to gas-related incidents. An APZ buffer will be included to minimise bushfire encroachment which could ignite explosive gas. The plans will be regularly reviewed and updated.

6.10.3.6 Reaction

The BESS is located in a rural area with significant separation between sensitive receptors, and as such, this hazard is unlikely to have off-site impacts. The off-site and public impact risk rating for the reaction hazard is identified as “very low” because the severity is “insignificant” and the likelihood is “rare”. Nevertheless, the following mitigation control measures will be implemented.

Design and Compliance to Standards: The equipment and systems in place will be designed and thoroughly tested to adhere to relevant international and/or Australian standards.

Procurement from Reputable Suppliers: All equipment will be sourced from reputable suppliers, assuring quality and reliability.

Independent Owner’s Engineer Endorsement: The BESS facility will be validated through the endorsement of an independent owner’s engineer.

Trained Personnel and Contractors: Installation, operations, and maintenance activities will be undertaken by qualified and trained personnel following all relevant site and safety procedures.

BESS Configuration and Clearance: The BESS configurations will adhere to specific clearances required by the manufacturer and/or applicable standards. This minimises the chance of fire spreading between BESS sub-units and other adjacent infrastructure.

Fault Detection and Shut-off Function: BESS equipment will incorporate fault detection and shut-off functions to allow rapid response to any malfunctions that could lead to gas release. A procedure for emergency shutdown will be implemented to address adverse reactions.

Cell Chemistry Selection: The appropriate selection of cell chemistry will ensure stability and safety within the system.

Fire and Explosion Protection System: The BESS will include a fire and explosion protection system, consisting of battery system-specific features.

Fault Detection and Shut-off Function: BESS equipment will incorporate fault detection and shut-off functions to allow rapid response to any malfunctions. A procedure for emergency shutdown will be implemented to stop operations in the event of adverse reactions.

Fire Management and Emergency Response Plans: A comprehensive Fire Management Plan and Emergency Response Plan will be developed, which will include establishing a defendable fire-fighting boundary and external firefighting protocols in conjunction with FRNSW & RFS. An APZ buffer will be included to minimise bushfire encroachment. The plans will be regularly reviewed and updated.

6.10.3.7 EMF

The BESS is located in a rural area with significant separation between sensitive receptors, and as such, this hazard is unlikely to have off-site impacts. The off-site and public impact risk rating for the EMF hazard is identified as “very low” because the severity is “insignificant” and the likelihood is “rare”. Nevertheless, the following mitigation control measures will be implemented.

Location: The location of the BESS facility has been chosen to maintain a suitable separation distance to sensitive receptors to minimise EMF effects.

Orientation: The layout and orientation of equipment have been optimised to reduce EMF exposure to sensitive receivers.

Conductor Spacing: The reduction of conductor spacing will further minimise the generation of EMF.

Balancing Phases and Minimising Residual Current: The operator will ensure that the electromagnetic fields produced by each phase cancel each other out, and residual/leakage currents are controlled to reduce unwanted EMF.

Incidental shielding: Incidental shielding, such as the BESS enclosures, will reduce EMF exposure.

Balancing Phases and Minimising Residual Current: Balancing phases involves ensuring that the electromagnetic fields produced by each phase and controlling residual currents to reduce EMF exposure.

Design and Compliance to Standards: The equipment and systems in place will be designed and thoroughly tested to adhere to relevant international standards to ensure acceptable EMF limits.

Short Duration Exposure: Personnels' exposure to EMD will be short in duration and transient in nature, further reducing the risk of EMF.

Warning Signs: Appropriate signage will be used to alert personnel and others to the presence of EMF.

Compliance with ICNIRP Occupational Exposure Limits: Studies have found that the EMF for commercial power generation facilities, including the BESS, comply with International Commission on Non-Ionizing Radiation Protection (ICNIRP) occupational exposure limits.

6.10.3.8 External Factors

The BESS is located in a rural area with significant separation between sensitive receptors, and as such, this hazard is unlikely to have off-site impacts. The risk rating for the water ingress and lightning strike hazards are identified as "very low" because the severity is "insignificant" and the likelihood is "rare". However, the risk rating for vandalism is identified as "medium" because the severity is "major" and the likelihood is "unlikely". Nevertheless, the following mitigation control measures will be implemented.

Water Ingress

Location: The development site is situated outside of a flood-prone area thereby reducing the risk of water ingress due to flooding.

Use of IP 55 Rated Enclosures: The use of GridSolv Quantum enclosures, which are IP 55 rated, provides protection against water ingress. These enclosures are specifically designed for outdoor use and can withstand water exposure.

Compliance with Standards for HV Connection Asset: The HV connection asset (33/330 kV switchyard) will be constructed in accordance with relevant standards. This ensures that all high-voltage connections are adequately insulated and protected from water.

Drainage System: A drainage system will be installed to manage and divert water away from critical areas. This system helps prevent water accumulation that could lead to ingress into electrical components.

Preventative Maintenance: Regular preventative maintenance checks for leaks to address any potential water ingress points before they become problematic.

BESS Configuration and Clearance: The BESS configurations will adhere to specified clearances required by the manufacturer and/or applicable standards. This minimises the chance of water causing a fire to spread between the BESS sub-units and onto other adjacent infrastructure.

Fault Detection and Shut-off Function: BESS equipment will incorporate fault detection and shut-off functions to allow rapid response to any malfunctions that may be caused by water ingress. A procedure for emergency shutdown will be implemented to stop operations in the event of water ingress malfunctions to prevent escalation.

Fire and Explosion Protection System: The BESS will include a fire and explosion protection system, consisting of battery system-specific features to safeguard against fires caused by water ingress.

Fire Management and Emergency Response Plans: A comprehensive Fire Management Plan and Emergency Response Plan will be developed, which will include establishing a defendable fire-fighting boundary and external firefighting protocols in conjunction with FRNSW & RFS. An APZ buffer will be included to minimise bushfire encroachment. The plans will be regularly reviewed and updated.

Vandalism

Location: Locating the BESS in a rural area reduces its visibility and accessibility to potential vandals. The more remote location lessens the likelihood of unauthorised access.

Secure Fencing and Area Protection: The BESS will be situated within a secure area, enclosed by maximum 3m high chain wire mesh security fencing. The use of robust fencing materials will create a physical barrier that will deter and prevent unauthorised entry.

Warning Signs Deployment: Warning signs will be prominently displayed at key points around the facility, including near access gates and along the fence line. These signs will provide clear notification of trespassing prohibitions and on-site hazards, serving as a deterrent to potential vandals.

Security Cameras Installation: Security cameras will be strategically installed throughout the BESS area, providing continuous surveillance. The cameras will be positioned to cover all potential access points, offering both a deterrent effect and the ability to detect and respond to any unauthorised access quickly.

Lighting Strikes

Lightning Protection Mast and Surge Protection Devices: Installation of a lightning protection mast and surge protection devices will protect the facility against direct lightning strikes and associated surges. These devices are specifically designed to absorb and divert the energy from a lightning strike, preventing it from reaching sensitive equipment.

Earthing Compliance: The facility will be designed with earthing systems that comply with manufacturer and standard requirements. Proper earthing further ensures that any surge is effectively grounded, reducing the risk of damage.

BESS Configuration and Clearance: The BESS configurations will adhere to specified clearances required by the manufacturer and/or applicable standards. By ensuring proper spacing between BESS sub-units and adjacent infrastructure, the risk of a fire caused by a lightning strike spreading is minimised.

Fault Detection and Shut-off Function: BESS equipment will incorporate fault detection and shut-off functions to allow rapid response to fires that are caused by lightning strikes. A procedure for emergency shutdown will be implemented to stop operations in the event of water ingress malfunctions to prevent escalation.

Fire and Explosion Protection System: The BESS will include a fire and explosion protection system, consisting of battery system-specific features to safeguard against fires caused by water ingress.

Fire Management and Emergency Response Plans: A comprehensive Fire Management Plan and Emergency Response Plan will be developed to address fire hazards, including those caused by a lightning strike. The plan will include measures to detect, control, and extinguish fires, minimising potential damage. This includes external firefighting protocols in conjunction with FRNSW & RFS. An APZ buffer will be included to minimise bushfire encroachment into the BESS facility as a result of lightning strike. The plans will be regularly reviewed and updated.

6.10.4 Contamination

As part of the geotechnical investigations of the site, a PSI prepared by ENV Solutions has been submitted at Appendix T. The PSI includes the following to inform the assessment:

- A desktop review of the site conditions, history and surrounding environment;
- Identification of past and present potentially contaminating activities and chemicals of potential concern (COPC);
- An inspection of the site and adjacent areas of land;
- Development of a preliminary conceptual site model (CSM);
- Discussion regarding the potential for contamination to exist on the site;
- A site investigation and soil sampling program; and
- Assessment of the suitability of the site for the proposed commercial use.

The PSI found that the site is gently sloping and has been utilised for agricultural purposes such as improved pastures, grazing and cropping. The BESS footprint contains two small livestock shelters with no other permanent buildings identified. Historical imagery did not identify any other areas of concern. Considering the site has been used for agricultural purposes, potential sources of contamination primarily include the use of pesticides, fertilisers.

To address the chemicals of potential concern outlined above, a site inspection and soil sampling program were undertaken on 5 July 2023 with soil samples being collected from the upper soil areas of the surface soil at thirty discrete locations throughout the proposed battery energy storage facility and along the proposed transmission line. No olfactory or visual signs of contamination were observed throughout this investigation.

Laboratory analysis results reported that concentrations of heavy metals were below the adopted assessment criteria and pesticides were below the limit of reporting. The maximum concentration of chemicals of potential concern at all sample locations were less than the adopted commercial use assessment criteria. The results from the soil sampling also fall below the more conservative residential HIL-A and Residential EIL assessment criteria.

On the basis of the PSI findings, the investigation area is considered suitable for the proposed commercial land use from a chemical perspective.

6.10.4.1 Mitigation

There are no management or mitigation measures recommended as part of the PSI, however the following is recommended:

- As part of the preparation of a Construction Environmental Management Plan, an Unexpected Finds Protocol (UFP) should be prepared in the event that unexpected finds are identified at the site during excavation works. The contamination unexpected finds protocol would define processes and responsibilities in the event that unanticipated contamination is identified. It is

also intended to provide guidance to workers at the site in recognising potentially unacceptable material including:

- Visually contaminated or odorous soil and/or groundwater
- Asbestos-containing material (ACMs) buried infrastructures such as old asbestos pipes sheeting, or tile, with fibres observable along breaks in material.

6.11 Social impact

A Social Impact Assessment (SIA) has been undertaken by Urbis and is provided at Appendix U. The SIA has been prepared to meet the requirements of the SEARs issued for the project which states the following:

> ***Social Impact*** *– including an assessment of the social impacts in accordance with the Social Impact Assessment Guideline (DPIE, 2021);*

The assessment of the social impacts considered a range of complex factors and \ competing interests. The impact assessment is reflective of this and has:

- Assessed some aspects of the Project as both negative and positive as they relate to different groups of people
- Included negative impacts on local communities while documenting the benefits to the broader region
- Identified management strategies to maximise identified benefits and mitigate and minimise negative impacts
- Considered the impacts on vulnerable groups and provided management strategies to ensure that any existing disadvantages are not exacerbated, and
- Considered each community's access to critical resources, such as education, housing and health care, and how this affects their resilience.

6.11.1 Social baseline

The site is located in the NSW suburb of Calala, where most of the immediate impacts and benefits will be experienced. The nature and scale of the project will also result in impacts and benefits felt across the Tamworth Regional LGA, including those related to supply chains, transport networks, and employment opportunities.

Key characteristics of the community include:

- There is a high proportion of working aged people (25-54 years), comprising 40.0% of the total population, compared to Tamworth (36.13%) and NSW (40.5%).
- There is a low proportion of people aged over 65, comprising 14.6% of the population compared to 19.9% in Tamworth.
- 425 people (10.8%) identified as being Aboriginal and/or Torres Strait Islander, a proportion comparable to that of Tamworth (12.7%).
- Calala has a low level of unemployment of 2.8% compared to Tamworth's 4.5%, with the top occupation being professionals. The top three industries of employment were secondary education (4.8%), hospitals (4.4%), and other social assistance services (3.8%).
- Calala has high personal and family income rates, with a median weekly total personal income of $914 (compared to $755 across Tamworth), and a median weekly family income of $2,112 (compared to $1,821 in Tamworth).

- There is a high rate of asthma in both Calala (11.1%) and Tamworth (11.2%) compared to NSW (7.8%). There are also higher rates of mental health conditions in Calala (11.1%) and Tamworth (10.7%) compared to across NSW (8.0%).

Vulnerable groups within the study area include socio-economically disadvantaged groups, elderly and persons with a disability (need for assistance), children with neurodevelopmental and neurobehavioral disorders (such as autism and attention deficit hyperactivity disorder, and overweight/obese children).

Crime data from the BOSCAR indicates that Calala generally has lower rates of crime compared to Tamworth and NSW averages. However, there were some crime types where Calala had higher rates of crime per 100,000 people than the NSW averages, including:

- Break and enter dwelling: 561.3 (compared to 234.0 in NSW)
- Motor vehicle theft: 323.8 (compared to 158.6 in NSW)
- Steal from motor vehicle: 928.3 (compared to 338.4 in NSW)
- Trespass: 259.1 (compared to 136.2 in NSW)

As such, this crime profile indicates that the suburb may be more susceptible to opportunistic and theft crimes relating to residences and motor vehicles.

The SIA includes identification of the values, strengths and vulnerabilities which are identified in Table 37 below.

TABLE 37 – VALUES, STRENGTHS AND VULNERABILITIES

VALUES	STRENGTHS	VULNERABILITIES
Value on the ‘closeness to everything’	Strong connection to the broader region via industry and transport	Poor local road conditions
Water security, and climate resilience	Lead agricultural producer in the region	Water supply and security
Strong sense of community, and distinct community identity	High personal and family incomes	Need for more community facilities and recreational opportunities
Strong value on the natural environment and need for sustainable economic development	Support for growth of the renewables industry	High rates of theft-related crimes
Value of the rural lifestyle	High levels of socio-economic advantage	High rates of long-term health conditions including asthma and mental health
	Strong labour force participation	

6.11.2 Engagement

Engagement was undertaken with several agencies and community groups to inform them of the Project and provide an opportunity for feedback on the proposal. This engagement has been documented within the Engagement Summary prepared by Equis accompanying the EIS. In addition to the consultation and engagement undertaken by Equis as discussed in Section 5, Urbis conducted additional consultation via a community survey and additional stakeholder interviews.

The survey was undertaken between 23 June and 10 July 2023 which was made available to the whole community. The survey was advertised on the Equis Energy eHub portal which was emailed to community members that have registered as living with 1km of the site. A total of four responses were received. This low rate of responses is considered due to 'consultation fatigue' where community members can be come exhausted and stressed by the repeated engagement activities. The responses like the tranquil, quiet and rural atmosphere of Calala as well as the proximity to amenities and local shops. Concern was raised with the encroachment of industry, potential developments, deterrence of residential development and impact on property values.

Interviews undertaken by Urbis were via phone on 30 July 2023 with 2 residents located within 500m of the site. Several concerns were raised during the interviews, mainly the impact of the development on the local character which was closely tied to the visual impact concerns raised. Other concerns include amenity, land values, health and safety, traffic and flooding.

The concerns raised by during the engagement and consultation undertaken by Urbis are addressed through the social impact assessment and associated mitigation measures outlined in Section 6.11 of this EIS.

6.11.3 Social impact assessment

The following section provides an overview and summary of potential social impacts resulting from the proposal. Refer to Section 6 of the SIA for a detailed assessment of the significant social impacts.

TABLE 38 – ASSESSMENT OF SOCIAL IMPACTS

Social impact / Social benefit	**Matter**	**Unmitigated / Unenhanced**	**Mitigated / Enhanced**
Way of life	Impact to local character	**Impact:** Medium (-ve)	**Impact:** Low (-ve)
Assessment:			
Due to the perception that the industrial nature of the BESS facility will contrast with the rural aspect of Calala, there is an anticipated impact on the local character. This change would particularly impact the local community, including nearby residents. During consultation, residents expressed concerns that the BESS was not consistent with the agriculture typical of the surrounding area. The Landscape Character and Visual Impact Assessment (LCVIA) notes several community concerns about specific visual impacts, raised by 5 of 14 neighbouring properties. The main visual features (inverters, substation, switchyard, lightning mast, etc), in addition to the removal of vegetation and trees during construction, would cause visual impacts that risk changing the local character of the area. Recognising the value placed on local character, and the moderate-low impact as assessed by the LCVIA, the unmitigated impact is assessed as **medium**, with a likely possibility and minor magnitude. Implementation of mitigation measures recommended by the LCVIA and the SIA, such as perimeter landscaping, colour recommendations and lighting design principles, resulting in the impact being **low**, with a possible likelihood and minor magnitude.			

Community	Distribution of impacts and benefits and its effect on community cohesion and resilience	Impact: Medium (+ve)	Impact: High (+ve)

Assessment:

The SIA notes sharing the benefits of infrastructure development can enhance the social and economic outcomes for the local community (Victorian State Government, 2021), build community support for Projects and the renewable energy sector and enhance community cohesion and resilience.

Consultation with a number of key stakeholder groups and agencies raised a number of potential benefits and opportunities relating to the Project's potential role in community benefit initiatives. Concern was raised during consultation in relation to the development, which could be the result of not having a clear understanding of the benefits of the project, as well as clear transparency on how project impacts will be mitigated.

The engagement undertaken and the SIA confirm the Calala community values its strong sense of community, the natural environment and character of the area, sustainable economic development and its rural lifestyle. Further, the identified strength of the community is its strong connection to the broader region via industry, its role in being a lead agricultural producer in the region and general support for the renewables industry.

The Calala BESS will generate project impacts to the local community, mainly related to construction and visual impact, however it will also deliver social, environmental and economic benefits by increasing local job opportunities and allowing for increased solar and wind energy to be integrated into the grid to help meet NSW's future electricity demand and lower the cost of electricity.

This unenhanced impact is assessed as **medium**, with a likely likelihood and moderate magnitude.

The implementation of community benefit initiatives and partnerships will likely have a positive impact on contributing to community cohesion and resilience at a moderate magnitude and therefore this enhanced impact is assessed as **high**.

Accessibility	Traffic impacts relating to congestion	Impact: Medium (-ve)	Impact: Low (-ve)

Assessment:

During construction and operation, there is a risk the project will result in increased traffic, increased heavy vehicles, temporary access and route detours, and slower travel speeds – all of which will impact the accessibility of the local community, including residents and workers. Recognising the existing poor road conditions, particularly during times of flooding, as well as the number and frequency of additional project vehicles which will be using these roads, this impact is assessed as **medium**, with a possible likelihood and minor magnitude.

The TIA outlines several mitigation and management measures designed to reduce the impact of the project on congestion, including:

- The contractor will ensure that all traffic management approvals for works/traffic management arrangements along Local Roads associated with OSOM movements are obtained from the relevant Council prior to any work commencing.
- Effective on-going consultation will be undertaken with relevant stakeholders during preparation of the TMP and throughout construction.
- Liaison activities will occur with the community prior to and throughout construction.
- Construction trucks are to always follow approved routes.
- Light vehicles to always drive responsibly and consider other road users. This will be incorporated at the site induction.
- Construction truck's arrival and departure are to be planned with consideration to minimising effect to other road users during peak traffic periods.

Following the recommendations of the TIA, this mitigated impact is assessed as **low**, with a unlikely likelihood and minor magnitude.

Culture	Potential disruption to sites of Aboriginal significance	Impact: Medium (-ve)	Impact: Low (-ve)

Assessment:

There is a potential risk for disruption to sites of Aboriginal significance as a result of project activities during both construction and operation. The Aboriginal and Cultural Heritage Assessment (ACHAR) identified that there are 97 Aboriginal cultural heritage sites within an 8.5km search area registered with the aboriginal Heritage Information Management System (AHIMS) register. No previously unrecorded Aboriginal cultural heritage sites were identified during the ACHAR's survey, and no areas of archaeological sensitivity were identified.

Notwithstanding the above, given the large proportion of the community who identified as Aboriginal and/or Torres Strait Islander and the ACHAR's conclusion of low potential for additional sites in the study area, the potential disruption to sites of Aboriginal significance is assessed as **medium**, with an unlikely and moderate magnitude.

Mitigation measures recommended by the ACHAR include:

- Continued consultation with Registered Aboriginal Stakeholders;
- A heritage induction should be undertaken for all site workers and contractors in order to prevent any unintentional harm to Aboriginal sites located within the study area and its surroundings;
- A plan of management for the discovery of unanticipated Aboriginal objects, and for the discovery of unanticipated historical relics; and
- A plan of management for the discovery of human remains.

Given the ACHAR's assessment as low potential, and the thoroughness of the recommended plans of management, this mitigated impact is assessed as **low**, with a very unlikely and moderate magnitude.

Health and wellbeing	Health and safety in the event of a hazard	Impact: Medium (-ve)	Impact: Low (-ve)

Assessment:

Some project activities may exacerbate the risk of hazards occurring in the local area, which could cause potential impacts to the health and wellbeing of the local community. In particular, the hazards considered as part of the SIA include flooding, battery explosions, bushfire, and other hazards identified in the Preliminary Hazard Analysis (PHA). The PHA identifies 13 potential hazard risks, all of which are expected to be very low risk with the exception of vandalism which is **medium**.

The SIA notes the concerns related to health and safety as a result of a hazard predominantly arise from anxiety and perceived impacts of the proposal. Recognising this in conjunction with the findings of the bushfire and water management reports, the unmitigated impact of the proposal is assessed as high, with a likely and moderate magnitude.

The bushfire and water management reports include mitigation measures to reduce the effects of any impacts resulting from the hazards present. The mitigation measures are discussed in further detail in Appendix U of this EIS. Further, a mitigation measure recommended by the SIA includes clear and consistent communication with nearby landholders, including the provision of relevant technical information about the risk of hazards. Unmitigated, this impact is assessed as medium with an unlikely likelihood and moderate magnitude. The mitigated impact on health and safety in the event of a hazard is assessed as **low**, with an unlikely likelihood and minor magnitude.

Surroundings	Benefit to the environment via reduced emissions	Benefit: Low (+ve)	Benefit: High (+ve)

Assessment:

The Calala BESS will contribute to a net positive benefit to the environment via the reduction in emissions which would have otherwise been produced. The SIA notes the environmental benefit will have a flow on social benefit to the environmental values held by communities across the region. The project is located in close proximity to the New England Renewable Energy Zone, which the Planning Context (Section 4.2) identified as contributing to an emerging renewables industry and green economy centred around Tamworth. The proposal aligns with the Farrer Memorial Agricultural High School's vision to build infrastructure that supports the school's energy and environmental sustainability, such as dams, solar panels, and BESS facilities. This may offer a sense of pride or feeling of connection following their proximity to, or involvement with, the transition to renewables and green energy.

Unenhanced, the limited direct benefit felt by the local community is assessed as **low**, with a possible and minimal magnitude.

To enhance the social benefit relating to a reduction in emissions, the Project could consider building partnerships with local organisations such as the Farrer Memorial Agricultural High School which could strengthen the community's perceived alignment with the transition to renewables. Offering educational tours of the facility, or providing the school with some statistics about their energy usage and/or emissions for use in class are some examples of how social benefit can be enhanced through

school partnerships. If the recommendations of the SIA are implemented by the project, the **enhanced** benefit could be assessed as **high**, with a likely and moderate magnitude.			
Surroundings	Amenity impacts relating to noise	Impact: High (-ve)	Impact: Low (-ve)
Assessment:			
There is a significant possibility for the Calala BESS to cause amenity impacts relating to noise disturbance on several residences within 500m of the project site. Feedback during consultation raised noise as one of the primary concerns arising from the project, noting the 24/7 operation impacting residents' daily lives and property values. The Noise and Vibration Impact Assessment confirms that the predicted noise level for the 'base' project design, without additional noise controls, is up to 5dB above the evening and night project noise level trigger level of 5dB at some receivers. Given the high proportion of residents who raised noise as a concern, and the NVIA's assessment that noise mitigations are necessary, this **unmitigated impact is assessed as high**, with an almost certain and moderate significance. The NVIA provides mitigation measures to minimise noise including perimeter noise barriers, resulting in compliance with the evening and night project noise trigger levels. Implementation of the design changes to mitigate noise impacts, as well as the perceived impact of disruption from noise, the mitigated impact is assessed as **low**, with an unlikely likelihood and minor magnitude.			
Surroundings	Amenity impacts relating to visual disruption	Impact: Medium (-ve)	Impact: Low (-ve)
Assessment:			
The Calala BESS facility is anticipated to cause a visual impact to the amenity of surrounding residences and the local community. Concern raised during consultation included the potential use of lights by the BESS, particularly at night. The LCVIA also notes the visual impacts of the BESS would be most substantial for Receptor R9. The almost certain visual impact to at least one nearby residence, results in an unmitigated impact assessed as **medium**, with a moderate magnitude. Mitigation measures recommended by the LCVIA including perimeter landscaping, colour recommendations and implementation of lighting design principles, can assist in avoiding night sky impact, reduce the visibility and contrast of the project in the landscape, minimise the impact to the existing landscape character, retain the existing screening vegetation, and enhance the screening of the project. Following the recommendations outlined by the LCVIA, this mitigated impact is assessed as **low**, with an unlikely likelihood and minor magnitude.			
Livelihoods	Provision of jobs and economic opportunities	Benefit: High (+ve)	Benefit: High (+ve)

Assessment:			
The project will generate a total of 170 jobs during construction and 7 jobs during operation. Jobs created will include general labourers, site managers, electricians, engineers, concrete suppliers, and landscapers. This impact will predominantly benefit the local workforce, such as those involved in the construction industry, predominantly technicians and trade workers, which accounts for 15% of Calala's labour force (based on ABS Census data discussed in the SIA). There may also be a small benefit to some nearby businesses, as the project will aim to prioritise buying from local contractors, suppliers and service providers. This additional demand may produce a marginal net economic benefit to local businesses. Given the certainty of 170 jobs provided during construction and 7 during operation, this unenhanced benefit is assessed as **high**, with an almost certain and moderate magnitude. The SIA notes the project will seek to align its procurement process with government objectives to support the Local Jobs First Program (LJFP), Social Procurement Framework (SPF), and Social Impact Guidelines (SIG). On the basis of locally sourced employment, this enhanced benefit is assessed as **high**, with an almost certain and moderate magnitude			
Livelihoods	Provision of a secure source of energy	Benefit: Medium (+ve)	Benefit: Medium (+ve)
Assessment:			
The Calala BESS facility will provide a secure source of energy to the Tamworth region and have a corresponding social benefit to the climate resilience of the region. The ability for the BESS to provide energy will be felt on a regional scale. The purpose of a BESS facility is to store energy which can be quickly discharged when there is an imbalance in the electricity supply, avoiding the burning of coal from older legacy generators while reducing carbon emissions. As the BESS should be able to support electricity supply when there is not enough sun or wind to generate electricity, it can provide a more secure source of energy for regional communities. As such, this unenhanced benefit is assessed as **medium**, given the likely and minor magnitude. The SIA does not provide any enhancement recommendations for this benefit.			
Livelihoods	Perceived impact to property values	Impact: Medium (-ve)	Impact: Low (-ve)
Assessment:			
Consultation with the local community identified a perceived potential impact on property values in the local area. In the event this is experienced, the potential impact would predominantly impact a small number of homeowners who reside within 500m of the Calala BESS site. There is no direct evidence linking the presence of a BESS with devalued properties. The concern predominantly relates to the perception that property values will decrease which may have an adverse impact on the mental health of nearby residents due to the anxiety resulting from uncertainty. As such, this unmitigated impact is assessed as **medium**, given the possible and minor magnitude.			

Implementation of the mitigation measures recommended by both the NVIA and the LCVIA will result in the mitigated impact being assessed as **low**, given the unlikely and minor magnitude.			
Livelihoods	Strengthened connections with industry	Benefit: Low (+ve)	Benefit: High (+ve)
Assessment:			
The Calala BESS has the potential to strengthen connections between the industry and local organisations or businesses such as schools. There are a range of potential opportunities to strengthen industry connections as identified during the consultation process therefore this unenhanced benefit is assessed as **low**, with an unlikely and minimal magnitude. Equis is exploring opportunities to partner with the Farrer Memorial Agricultural High School and are exploring several initiatives with the adjoining school as discussed in the SIA. This includes expanding the curriculum to including education, training and skill development in the renewable energy sector and supporting the school to pursue opportunities to farm the agricultural land surrounding the Calala BESS. Equis is also exploring opportunities to support tourism in the region through events funding such as supporting the Tamworth Regional Heritage Festival. Following these recommendations, this enhanced benefit is assessed as **high**, with a likely likelihood and moderate magnitude.			
Decision-making systems	Community unrest relating to transparency	Impact: High (-ve)	Impact: Medium (-ve)
Assessment:			
There is potential for community unrest to be fostered via a perceived lack of transparency and adequate communication with nearby neighbours. Consultation and engagement with the community and relevant stakeholders has been undertaken as discussed in Section 5 of this EIS which includes a community information night, stakeholder interviews, the establishment of an engagement portal (Equis eHub), and additional stakeholder engagement activities undertaken as a part of the SIA Field Study, including a survey. Respondents expressed disappointment during consultation of the project, stating they did not feel it was an open sharing of information, there was not a lot of belief or confidence in the process, and requesting more technical information about the impacts (such as noise). Concern was also raised regarding the ability to access the eHub due to some residents being elderly and unable to express their thoughts. Given the extent and frequency of community unrest raised by nearby residents, this unmitigated impact is assessed as **high**, with an almost certain and moderate magnitude. Mitigation recommended by the SIA include monitoring and managing the eHub engagement portal, actively managing complaints management system, and maintain clear and consistent communication with nearby landholders about project changes and updates. The SIA also recommends a 'Summary of Impacts' document and distribute it to nearby neighbours through a letter-box drop, which would contain relevant technical information addressing the prime concerns raised throughout consultation. The SIA also recommends neighbours be updated on the status of the project and when it will be available on the DPE's website to receive submissions. The exhibition phase would provide stakeholders with transparent access to the results of the technical studies and may remedy			

community unrest and/or anxiety regarding a lack of information. Implementation of these mitigation measures will result in a mitigated impact assessed as **medium**, with a likely and minor magnitude.			
Cumulative	Cumulative impacts relating to the Project's location nearby the New England Renewable Energy Zone	Impact: Medium (-ve)	Impact: Low (-ve)
Assessment:			
The Project is located in close proximity to the New England Renewable Energy Zone, wherein the Tamworth region has been earmarked for future renewable industry projects and development. The proximity of the Project to the existing Tamworth substation, as well as to future renewable energy developments, may contribute to cumulative impacts on the local community. These cumulative impacts may include construction related amenity and accessibility changes, such as cumulative noise or traffic impacts. As the project aligns with the regional strategy and transition towards renewables, and the community are aware of the potential for future projects within their region, this unmitigated impact is assessed as **medium**, given the likely and minor magnitude. To mitigate the potential cumulative impacts of other developments, a Construction Management Plan and Plan of Management should be prepared and continually applied to the Calala BESS. These plans should be reviewed if any additional projects are announced nearby. Assuming any future developments will also undertake a similar process of assessment before approval, and assuming that the project abides by its relevant plans and recommended mitigation measures, this mitigated impact is assessed as **low**, with a possible and minimal magnitude.			

6.11.4 Mitigation measures

The following mitigation measures are recommended by Urbis in relation to each of the matters listed in Table 39 below:

TABLE 39 – SOCIAL IMPACT MITIGATION MEASURES

THEME	IMPACT/BENEFIT	MITIGATED/ENHANCED RATING	PROPOSED MITIGATION, ENHANCEMENT AND MANAGEMENT
Way of life	Impact to local character	Impact: Low, Negative	Compliance with the recommendations and mitigation measures in the LCVIA. No further mitigation measures are recommended by the SIA.
Community	Distribution of impacts and benefits and its effect on community cohesion and resilience	Impact: High, Positive	Equis to explore community benefit initiatives to develop positive and direct relationships with the community through contributing to their local plans and goals, increasing local support for the project to build a social license to operate and enhance community understanding of the

THEME	IMPACT/BENEFIT	MITIGATED/ENHANCED RATING	PROPOSED MITIGATION, ENHANCEMENT AND MANAGEMENT
			project and the renewable energy sector more broadly. Partnerships are being explored with Farrer Agricultural High School, the NSW Rural Fire Service and Tamworth Regional Council. No further mitigation measures are recommended by the SIA.
Accessibility	Traffic impacts relating to congestion	Impact: Low, Negative	The TIA outlines several mitigation and management measures designed to reduce the impact of the project on congestion, which will be finalised and documented in the Traffic Management Plan (TMP) by the appointed contractor post approval of the development. The SIA includes a recommendation that the project should also abide by the protocols outlined by the Construction Management Plan and Traffic Management Plan, which will be prepared prior to the commencement of works.
Culture	Potential disruption to sites of Aboriginal significance	Impact: Low, Negative	The ACHAR determined that no further archaeological assessment is required and outlines several mitigation measures. No further mitigation measures are recommended by the SIA.
Health and wellbeing	Health and safety in the event of a hazard	Impact: Low, Negative	The Bushfire Risk Assessment includes several recommendations for managing bushfire risk. Further, Equis is exploring opportunities to support the NSW Rural Fire Service in potential initiatives such as funding the Farmers Partnership Program to help train and involve local farmers with regional firefighting efforts, as well as funding to support the Girls on Fire program to train, mentor and engage women to volunteer in the RFS. The SIA recommends the project should maintain clear and consistent

THEME	IMPACT/BENEFIT	MITIGATED/ENHANCED RATING	PROPOSED MITIGATION, ENHANCEMENT AND MANAGEMENT
			communication with nearby landholders, including the provision of relevant technical information about the risk of hazards.
Surroundings	Benefit to the environment via reduced emissions	Benefit: High, Positive	Equis is exploring opportunities to partner with the Farrer Memorial Agricultural High School to strengthen the community's perceived alignment with the transition to renewables. Potential initiatives being explored with Farrer Memorial Agricultural High School include expanding the School's curriculum to include education, training and skill development in the renewable energy sectors, funding to support the high school to build sustainable infrastructure and allowing the School to farm the agricultural lands surrounding the Calala BESS. No further mitigation measures are recommended by the SIA.
Surroundings	Amenity impacts relating to noise	Impact: Low, Negative	The NVIA explains that design development has been undertaken to introduce physical noise controls which can assist in demonstrating compliance with the evening and night project trigger levels including a noise attenuation wall directly adjoining the BESS to the north and west boundaries of the site and near-field barriers to the HV transformers. Section 6.3.2 of the NVIA outlines the recommended construction materials and protocols which should be used when constructing these perimeter noise barriers. With the inclusion of suitable noise control measures, including the proposed noise attenuation wall, the NVIA concludes that the project achieves full compliance with the evening and night project noise trigger level (NVIA Section 6.5).

THEME	IMPACT/BENEFIT	MITIGATED/ENHANCED RATING	PROPOSED MITIGATION, ENHANCEMENT AND MANAGEMENT
			No further mitigation measures are recommended by the SIA.
Surroundings	Amenity impacts relating to visual disruption	Impact: Low, Negative	The LCVIA recommends several mitigation measures in order to reduce the visual impact of the project. No further mitigation measures are recommended by the SIA.
Livelihoods	Provision of jobs and economic opportunities	Benefit: High, Positive	Equis is committed to adopting a procurement process that includes a Local Jobs First Program, Social Procurement Framework and Social Impact Guidelines. No further mitigation measures are recommended by the SIA.
Livelihoods	Provision of a secure source of energy	Benefit: Medium, Positive	There are no recommendations or mitigation measures for this benefit.
Livelihoods	Perceived impact to property values	Impact: Low, Negative	The Project should align with the mitigation measures recommended by both the NVIA and the LCVIA. No further mitigation measures are recommended by the SIA.
Livelihoods	Strengthened connections with industry	Benefit: High, Positive	To strengthen industry connections with the local community, Equis is exploring opportunities to partner with the Farrer Memorial Agricultural High School and are exploring several initiatives with the School. This includes expanding the curriculum to including education, training and skill development in the renewable energy sector and supporting the School to pursue opportunities to farm the agricultural land surrounding the Calala BESS. Equis is also exploring opportunities to support tourism in the region through events funding such as supporting the Tamworth Regional Heritage Festival.

THEME	IMPACT/BENEFIT	MITIGATED/ENHANCED RATING	PROPOSED MITIGATION, ENHANCEMENT AND MANAGEMENT
			No further mitigation measures are recommended by the SIA.
Decision-making systems	Community unrest relating to transparency	Impact: Medium, Negative	Equis will continue to contact nearby residents to keep them updated on the project, including when it has been submitted to DPE and where they can review documentation and provide comment. The exhibition phase would provide stakeholders with transparent access to the results of the technical studies and may act as a means to remedy community unrest and/or anxiety regarding a lack of information. Equis have requested that the engineering technical consultants contact the residents who have raised technical concerns and provide clarity around impacts such as noise. Equis actively monitor the engagement portal morning and night, seven days a week. Equis responds to any concerns within two days. The SIA recommends that the project compile a 'Summary of Impacts' document and distribute it to nearby neighbours through a letter box drop, which could contain relevant technical information addressing the prime concerns raised through consultation. This document will be issued to nearby and adjoining residents at the same time this application is submitted to DPE. The newsletter will provide a direct project specific link to the DPE's Major Projects website where the public can view all the EIS application documents and provide their feedback on the project during the public exhibition process.
Cumulative	Cumulative impacts relating to the Project's location nearby the New England Renewable Energy Zone	Impact: Low, Negative	It is understood a Construction Management Plan and Plan of Management will be prepared prior to commencing works. The SIA recommends the project ensure that its Construction

THEME	IMPACT/BENEFIT	MITIGATED/ENHANCED RATING	PROPOSED MITIGATION, ENHANCEMENT AND MANAGEMENT
			Management Plan and Plan of Management which are to be prepared prior to commencing works, are continually applied to the Calala BESS and should review its plans if any additional projects are announced nearby.

6.12 Economic impact

The economic impacts of the development are assessed and considered by Rider Levett Bucknall (Appendix W). The assessment has been prepared in accordance with the *Environmental Planning and Assessment Regulation 2021* and Planning Circular PS 21-020 dated 2 December 2021. This section of the EIS also provides a review of the Social Impact Assessment (SIA) prepared by Urbis which provides an analysis of the socio-economic implications the development will have during the construction and operational phases. The economic impacts assessed as part of the proposal are measured against a 'do nothing' base and address the SEARs requirements which state the following:

- ***Economic*** *– including an assessment of the economic impacts or benefits of the project for the region and the State as a whole;*

The proposed development, exceeding $30 million, will provide a significant contribution to the local economy. Equis is committed to utilising local trades and materials wherever feasible and available to ensure the economic contribution benefits the local economy and community.

Employment Benefit Analysis

The proposed development will provide economic benefits through additional employment opportunities created during the construction and operational phases of the BESS. Equis have forecast the employment contribution throughout the community will result in a total of 170 jobs during the construction of the project, and 7 jobs during the operational phase. The project will therefore result in contributions to the regional economy in the form of annual direct and indirect purchases.

Equis is committed to adopting a procurement process that includes a Local Jobs First Program and sourcing materials and equipment locally, wherever possible. On this basis, the proposed development is expected to provide a positive contribution to the Calala community, as well as the broader economy in the Tamworth region and greater NSW.

Economic Output

Construction associated with the proposed development will provide direct impacts with job creation as well as indirectly stimulating other industries which assist in production or cater to increased consumption.

During operation, the proposed development will support permanent employment during the operational phase through ongoing maintenance, monitoring and repairs associated with BESS operations. It is estimated that a total of seven full time jobs would be provided as a result of the proposed development.

The proposal will indirectly support the viability of cheaper electricity generation cost sources, such as wind and solar, by contributing to network firming with the potential to provide cheaper household electricity costs to households in the Region, and to a lesser extent NSW. The BESS will smooth out energy spot prices and provide energy security and reliability, and it will indirectly support future capital investment in renewable energy projects in the Region and across NSW, further stimulating Regional and State economies.

Summary

The proposed development will result in an intensified economic outcome for the region, with the net increase in economic activity supported by 170 jobs during construction, a total net increase of 7 ongoing jobs as a result of the operation of the BESS, and the various multiplier effects and indirect economic stimulation as a result of the overall development.

6.12.1 Mitigation

No management or mitigation measures are recommended or required from an economic perspective.

6.13 Waste

The application is supported by a Waste Management Plan (WMP) prepared by JBS&G (Appendix V) as required by the SEARs requirement outlined below:

> ***Waste*** *– identify, quantify and classify the likely waste stream 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.*

The purpose of the WMP is to identify the types and quantities of potential waste streams and to establish management measures to prevent environmental harm, minimise waste and maximise resource preservation.

The WMP is prepared based on the requirements of the NSW *Waste Avoidance and Resource Recovery Act 2001* and the NSW *Protection of the Environment Operations Act 1997* and the various guidelines prepared by State agencies and authorities.

6.13.1 Impacts

Site Preparation and Construction

The WMP identifies the waste likely to be generated during the construction, operation and decommissioning phase of the development, which includes site preparation. The WMP identifies the potential and confirmed waste types. Quantities are unable to be specifically quantified until the detailed design phase of the development is complete. At that stage, the quantity of waste generated and the temporary waste storage area locations will be confirmed.

The WMP prepared by JBS&G identifies the potential waste streams expected to be generated during the site preparation and construction parts of the project. It is noted batteries, inverters and transformers will be manufactured off site. These items constitute the majority of the infrastructure on the site and in the case of batteries, will likely be returned to the supplier for reuse or recycling when removed from the site. The expected waste streams are summarised in Table 40 below.

TABLE 40 – ANTICIPATED WASTE STREAMS AND MANAGEMENT MEASURES

WASTE STREAM	MANAGEMENT

Concrete	Likely to be generated during construction due to excess concrete poured, which will be minimised wherever possible. Concrete can be reprocessed and may be reused across the site but would be required to be broken up/ crushed offsite. Excess concrete may be disposed of at a recycling facility, or wet concrete may be sent back to the producer.
Soil	Soil is likely to be generated during site establishment, tree removal, excavation and construction. Excess soil will be sampled, analysed and classified in accordance with EPA requirements prior to offsite disposal at a licensed facility. A soil management plan will be developed to provide guidance for all soil testing, excavation, reuse and disposal works. As noted in the contamination report prepared by ENV Solutions, the site is not contaminated and remediation is not required. The site is suitable for the proposed development and it is considered the soil excavated is suitable for reuse on site. Erosion and sediment control measures will be implemented where stockpiling is required. Where excess soil cannot be redistributed or reused, it will be taken off site.
Rock and excavated stone	Rock and excavated stone may be generated during potential excavation and construction of new structures for footing and foundation construction. Rocks or stone of a suitable size may be used as aggregate or sub-base for other works.
Metals	Metal waste may be generated as part of construction work, however will be minimised where possible. The contractor on site will investigate and determine appropriate storage and recycling of metals to reduce waste, including location and signage of skip bins onsite. Where recycling is not possible or feasible, offsite disposal to salvage yard for reuse will be organised.
Green waste/ wood waste	Green/wood waste is likely to be generated during removal of trees and excavation of topsoil (mulch) for site grading purposes. It is likely that wood waste (timber) may be generated from excess materials purchased as part of building construction works, although this will be minimised wherever possible. The contractor/site supervisor will investigate and determine appropriate storage and recycling of timber to reduce waste, including location and signage of skip bins onsite.
Plastics	Plastic wastes associated with packaging for construction materials can be recycled or in some cases returned to the supplier of the materials for reuse. Plastic (non-durable) wastes will be reduced where possible.
BESS Scale Batteries	There is potential for batteries that make up the BESS to fail during commissioning. Any failed batteries will be returned to the supplier for maintenance, recycling and/or disposal. All possible care will be taken during the transportation of the batteries to ensure the chance of battery failure is as low as possible prior to and during BESS construction. The contractor/site supervisor will ensure failed batteries are returned to the supplier and not directed to nearby waste facilities.
General Waste	Wastes such as food waste, organics and biodegradable material will be created as a result of worker activity on site and are not able to be composted, recycled, reprocessed or reused. Bins will be provided on site at congregation areas, the temporary site office and toilet facilities. Where possible, co-mingled recycling bins will be provided in common areas for separation of waste streams.

Waste during site preparation and construction phase will primarily be managed by a construction site manager who will be required to implement and adhere to the waste management plan, legislation, guidelines, licensing and project conditions. The Environmental Management Representative, Health and Safety Manager and site workers will also be responsible in management of waste during construction. Training and awareness, monitoring and reporting, and corrective action will be key elements in effective implementation of the WMP.

Measures to be implemented during the demolition, excavation and construction phases are discussed in Section 6.13.2 below.

Operation

Waste generated during the operational phase of the development will be negligible and the only waste likely to be generated will be from maintenance activities. The proposed development will not require any permanent staff members to be located onsite on a full-time basis. Therefore, no staff facilities such as offices, bathrooms, etc. are provided. This eliminates general operational waste produced by staff including food waste, paper waste, etc.

Waste expected to be produced during the operational life of the BESS is limited to materials required in the upkeep and maintenance of the BESS components. These materials will be transported to site by outside contractors and any waste produced during the maintenance of the BESS components will be removed from site by the contractors on completion of their task.

Since all waste will be removed from the site as its generated, no waste bins are required or provided on site. A waste contractor will also not be required on this basis.

Decommissioning

At the end of life of the proposed facility, if it is not to be upgraded or expanded, the BESS and site will be decommissioned. The BESS lifespan is currently calculated to be approximately 25 years. During decommissioning, all infrastructure will be removed with key elements including:

- Removal of all above-ground BESS site infrastructure, including the perimeter fencing, noise attenuation walls and control room
- Removal of concrete foundations with rehabilitation of the land suitable for resumption of agricultural use, or other use as agreed with the landowner; and
- Internal cabling and connection to the nearby substation will be removed, although some infrastructure below ground may be left in place subject to agreement with the landowner.

The majority of infrastructure removed during decommissioning is expected to be able to be recycled or repurposed, to be determined at the time of decommissioning and in accordance with statutory requirements at that time. A decommissioning specific WMP will be prepared prior to the commencement of the BESS decommissioning.

Mitigation measures to be implemented during the site preparation and construction phases are discussed in Section 6.13.2 below.

6.13.2 Mitigation

Mitigation measures identified in the WMP are identified below:

During site preparation and construction

Training and Awareness

Staff present on site during the construction stage of the project will be required to undertake induction and awareness training inclusive of the WMP and site-specific waste management. This includes:

- Induction to the waste management hierarchy and use across the site; and
- Details of responsibilities for waste management and key personnel;
- Site specific waste management practices relevant to the project stage such as:
    - Waste storage and stockpiling locations;

    - Waste disposal requirements;
    - Hazardous or special wastes;
    - Record of waste disposal details and receipts; and
- Knowledge of emergency response procedures and contacts; and
- Asbestos Awareness Training.

Signage will be provided on site to ensure waste management measures are communicated across the subject site, particularly for contractors and visitors who are not regularly on site. Signage will highlight correct procedures for separating wastes where required, locations of bins and waste storage areas, labelling of designated bins, potential hazards associated with the waste streams and handling, and contact details should any issues be encountered.

Signage will be prepared and located on site in accordance with the Australian Standard (AS 1319) for safety signs, and the NSW EPA and Australian Standard for recycling signage.

Monitoring and Reporting

The following activities will be undertaken to inform future onsite waste management and to determine the success of the WMP:

- Ensure waste quantities generated are recorded, including tracking of receipts from waste recycling or disposal via the appointed waste contractor;
- Record waste classification and testing results;
- Review the WMP in light of any changes to construction activities or further information which may alter waste management practices;
- Undertake auditing of waste management across the site as a component of broader environmental site audits;
- Undertake visual inspections daily to ensure waste management controls are implemented and maintained across site; and
- Undertake final review of the WMP upon project completion to ensure information accurately reflects site activities, and to assist future waste management.

Outcomes of audits and waste tracking will be reported to the client or the Principal Contractor, potentially through weekly or monthly reporting to ensure waste management objectives are adhered to.

Corrective Action

Where formal auditing, daily visual inspections or incident reporting identify incorrect storage or disposal procedures, or maintenance or waste management issues, observations will be promptly reported to the Construction Site Manager and recorded. The Construction Site Manager will determine appropriate measures to rectify the issues in a timely manner in consultation with the Environmental Management Representative and Health and Safety Manager where required.

<u>During operation</u>

Avoidance and Reduction of Waste

The ongoing site users (operational staff and contractors) will be required to minimise waste generation, and endeavour to reuse waste where available.

Waste should be avoided through strategic selection of materials during purchasing which takes into account options which may reduce waste generation during ongoing operation of the site. This includes

considering procurement of materials which use minimal packaging and are suitable for reuse. Selection of operational materials will also consider the use of recycled items where practicable.

Opportunities to avoid waste generated by operation include:

- Develop a procurement policy which considers waste avoidance measures such as:
    - Order site specific or prefabricated items where practicable to minimise surplus material.
    - Consider packaging material provided by suppliers during purchasing and reduce this requirement where possible or consider returnable packaging.
    - Material selection to consider recycled items.

Reuse and Recycling

Measures to separate waste streams should be implemented off site to maximise re-use and recycling.

Procedures to manage the reuse and recycling of waste materials during operation include:

- Incorporate waste management into site management procedures to promote reuse and/or recycling of materials.
- Consider opportunities for materials reuse and/or recycling where practicable.

Treatment and Disposal

Operational wastes may require treatment to stabilise them for appropriate disposal to reduce the risk of harm to human health or the environment (for example chemicals). These materials may not be suitable for reuse or recycling and will be segregated and disposed of via a suitably qualified contractor off site.

Waste will only be sent to landfill or disposal facilities where the prioritised management methods in the hierarchy cannot be implemented in a cost effective or practical manner.

Measures to manage the treatment and disposal of waste materials during operation include:

- Ensure waste which cannot be reused or recycled and require disposal are clearly segregated from those which have the potential to be reused.
- Maintenance staff to be inducted into site waste management practices.
- Hazardous materials to be disposed of in accordance with the handling and disposal requirements of SafeWork NSW and NSW EPA.
- General wastes to be disposed of in accordance with local council requirements.

Roles and Responsibilities

It is expected that all personnel attending the site (operational staff and contractors) will commit to the WMP and be responsible for their own actions in adhering to the waste management objectives. Operation of the BESS will not require any staff to be a constant presence at the BESS location. As the site will be largely unattended, implementation of the WMP will be managed by the site asset managers.

Training and Awareness

All staff and contractors will undertake awareness training of the WMP and site-specific waste management. This includes:

- Induction to the waste management hierarchy and use across the site.

- Details of responsibilities for waste management and key personnel.
- Site specific waste management practices such as:
    - Waste disposal requirements;
    - Hazardous or special wastes; and
    - Record of waste disposal details and receipts.
- Knowledge of emergency response procedures and contacts.

Monitoring and Reporting

The following activities will be undertaken to inform future onsite waste management and to improve the efficiency in achieving the outcomes of the WMP:

- Review the WMP in light of any changes to operational activities or further information which may alter waste management practices.
- Undertake auditing of waste management across the site as a component of broader environmental site audits.
- Undertake visual inspections to ensure waste management controls are implemented and maintained across site.
- Undertake annual review of the WMP to ensure information accurately reflects site activities, and to assist future waste management.

Where formal auditing, general inspections or incident reporting identify incorrect storage or disposal procedures, or maintenance or waste management issues, observations will be promptly reported to Equis management and recorded. Equis management will determine appropriate measures to rectify the issues in a timely manner.

6.14 Cumulative impacts

Consideration of the cumulative impacts of the development has been provided in accordance with the SEARs issued for the development dated 30 January 2023 and has been prepared in accordance with the Cumulative Impact Assessment Guidelines for State Significant Projects (CIA Guidelines). A cumulative impact is defined in the CIA Guidelines as being a result of incremental, sustained and combined effects of human action and natural variations over time and can be both positive and negative. They can be caused by the compounding effects of a single project or multiple projects in an area, and by the accumulation of effects from past, current and future activities as they arise.

This section of the EIS considers the cumulative impacts of the proposed development with other planned or future developments in the locality. In accordance with the CIA Guidelines, a summary of the cumulative impacts from a strategic-level and project level is provided in the relevant sections below.

6.14.1 Strategic-level CIA

As discussed in Section 2 of this EIS, the proposed BESS will contribute to and align with federal and state regional renewable energy policies which are summarised in Table 41 below.

TABLE 41 – FEDERAL AND STATE CIA

POLICY NAME	TARGET
Paris Agreement	The proposed development will contribute to Australia's target of reducing emissions by 26-28% below 2005 levels by 2030, through the generation of electricity from renewables. A key benefit of the Calala BESS is its

	positive impact on reducing greenhouse gas emissions and moving electricity generation towards cleaner electricity generation.
Climate Change Act 2022	The BESS will assist in achieving emissions reduction target of 43 percent from 2005 levels by 2030, and net zero emissions by 2050 by introducing up to 300 MW / 1200 MWh energy storage into the NEM.
Australian Government RET	Whilst it is understood the large-scale renewable energy target was met in September of 2019, the proposed BESS will assist in fulfilling the new obligations under the Climate Change Act 2022 to reach an overall target of 43% by 2050.
Net Zero Plan	The proposal will assist in meeting obligations under the Net Zero Plan of meeting net-zero emissions by 2050 and delivering a 50% cut in emissions by 2030 – a substantial increase from the proposed Paris Agreement. This project will assist the NSW government in reaching these targets by providing a renewable energy source for electricity storage.
Electricity Infrastructure Roadmap	The Electricity Infrastructure Roadmap sets out a 20-year plan to deliver renewable generation infrastructure, as well as the storage, firming and transmission infrastructure required to ensure NSW has continued access to cheap, clean and reliable energy as coal-fired power stations are retired. Large-scale battery energy storage system projects, such as the Calala BESS, can support jobs and investment in regional NSW and have the potential to increase the resilience of Tamworth and surrounds during the state's transition to renewable energy generation.
NSW Climate Change Policy Framework	The NSW Climate Change Policy Framework guides the NSW Government's policy and programs, including the NSW Climate Change Fund and the NSW Electricity Infrastructure Roadmap. This Project aids in meeting the net-zero emissions by the 2050 target as discussed above.
NSW Electricity Strategy	The proposal will contribute to the NSW government's plan to achieve the objectives for the electricity system which include reliability, affordability and sustainability. The contribution of the Project to local employment and economy is set out in detail in Section 6.12 of this EIS.

The proposal also aligns with regional and local land use plans as discussed in Section 4 of this EIS and summarised in Table 42 below.

TABLE 42 – REGIONAL AND LOCAL LAND USE CIA

POLICY NAME	TARGET
New England North West Regional Plan 2041	The New England North West Regional Plan 2041 places a large emphasis on renewable energy technology and investment in the New England region to address the region's goal in adapting to climate change and becoming resilient to change. The plan provides the framework to address the need for the 'integration of land use planning with resilience planning to avoid, prepare for, respond to, and recover from climate induced shocks'. There are several renewable energy projects that have been developed or are within the pipeline within the New England region, including those within the nearby New England REZ. The proposal will assist in directly supporting the region in the achievement of goals in the regional plan. The plan also discusses the promotion of diversification of energy supplies through renewable energy generation. The project directly contributes to this theme by taking advantage of the transmission infrastructure within close proximity of the

	site by providing a facility that contributes to the renewable energy goals established in the plan.
Blueprint 100 – Our Community Plan 2023-2033 (Tamworth Strategic Plan)	The Tamworth Strategic Plan provides key objectives and a vision to work with and protect the environment. The objective of the themes within the strategy is to protect and support the natural environment through responsive initiatives and development practices. This includes increased investment and provision of affordable and clean energy across the region and increase the percentage of renewable energy used. From a cumulative perspective, the Calala BESS will achieve this.
Tamworth Tomorrow – Economic Development and Investment Strategy 2022-2026	The Tamworth Tomorrow Strategy identifies that the Tamworth region is well positioned to capitalise on growing demand for renewable energy. The subject site is located nearby the New England REZ and is therefore a suitable location and candidate for the proposed development. The Calala BESS will contribute to investment opportunities in the identified renewable energy sectors.
Renewable Energy Zones	REZs are being created by the NSW Government to concentrate power generation, transmission, and storage in identified areas to unlock new capacity for the energy grid. Whilst the Calala BESS is not located within a REZ, it is adjacent to the New England REZ. It is acknowledged that investment outside of the REZ's is required to meet state and national clean energy targets. The Calala BESS is an example of a project that will cumulatively assist in meeting energy targets.
Tamworth Regional LEP – Land zoning	The Tamworth LGA covers an area of approximately 9,884 km2 (~988,400 ha). According to the zoning of the Tamworth Regional LEP, approximately 919,913 ha of land is used for or has potential for agricultural use in the LGA (being zoned RU1, RU2 or RU4). The temporary loss of 8.9 ha of agricultural land within the Tamworth Regional LGA represents a small fraction (~0.0009% within the LGA). As such, cumulative impacts to the region's agricultural capacity under provisions in the LEP are negligible.

6.14.2 Project-level CIA

This section of the EIS considers the cumulative impact of the proposed development with other projects in the locality at a project level. At the time of preparing this EIS, the projects listed in Table 43 below are Major Projects listed on the Major Projects Planning Portal within the Tamworth Regional LGA. A summary of the projects and their status/stage are provided below:

TABLE 43 – PROJECT LEVEL CIA

PROJECT NAME	STATUS/STAGE
Kingswood BESS	Prepare EIS
Middlebrook Solar Farm	Response to Submissions
Hills of Gold Wind Farm	Assessment
Tamworth BESS	Prepare EIS
Thunderbolt Wind Farm	Response to Submissions
Bendemeer Solar Farm	Response to Submissions
Chaffey Dam Pipeline Project	Withdrawn

Rushes Creek Poultry Farm (Modification)	Under Assessment
Nottingham Park Solar Farm	Prepare EIS
Tangaratta Feedmill	Prepare EIS
Dungowan Dam	Withdrawn
Baiada Poultry	Determination
Keepit Dam Upgrade	Determination
Tamworth Solar Farm	Determination
Baiada Integrated Poultry Processing Facility	Determination
Chaffey Dam Upgrade	Determination
Peel Valley Tamworth Abattoir	Determination
Tamworth Hospital Redevelopment	Determination
Woolbrook Wind Farm	Withdrawn
Tamworth Grain Refinery	Withdrawn
Tamworth Hospital – Cancer Centre	Determination
Manilla Hospital	Determination

Noting the proximity of the site to the New England Renewable Energy Zone, only two other BESS projects are proposed, being Tamworth BESS located at 696 Burgmanns Lane, Calala and the Kingswood BESS located at 744 Burgmanns Lane, Kingswood. The status of both the Tamworth and Kingswood BESS on the Major Projects Portal is 'Prepare EIS' with the Scoping Report relied upon to inform the potential cumulative impact assessment.

The Tamworth BESS proposes a 200MW/ 400MWh battery storage system with a footprint of 3.2 hectares. That development will be located in closer proximity to public roads and residential properties, and therefore likely result in a greater impact from a visual, acoustic and overall public amenity perspective.

Kingswood BESS is a proposed 500MW / 1,000MWh battery storage facility located south of the subject site at 744 Burgmanns Lane, Kingswood NSW 2340. The proposal is for the construction of a BESS over two stages – Stage 1 being for 250MW and up to 500 MWh, and Stage 2 being an increase up to 500MW and up to 1000MWh of storage capacity. The proposal includes installation of enclosures, inverters, transformers and control building, installation of a transmission line to Tamworth substation, realignment of the existing 330kV transmission line on the site, site access, office and amenities, utilities, stormwater management and landscaping. The project is currently at EIS preparation stage.The proposed Calala BESS is located in an isolated portion of the subject site and is setback over 450m from the nearest public road and 443m from the closest residential property. The proposed BESS will be further enhanced to minimise the cumulative impact by providing noise attenuation walls, landscape screening, and will provide an underground transmission cable to the Tamworth Substation, which is discussed further in the section below.

6.14.3 Impacts

The cumulative impacts of the proposed development and surrounding developments are discussed in Table 44 below.

TABLE 44 – CUMULATIVE IMPACTS SUMMARY

PROJECT NAME	DESCRIPTION AND STATUS	RELATIONSHIP TO PROPOSAL	CUMULATIVE IMPACT
Tamworth Battery Energy Storage System (BESS) – 696 Burgmanns Lane, Kingswood 2340	Development of a 200 megawatt (MW)/400 megawatt hour (MWh) BESS	The proposed development is the same development type as the Tamworth BESS. The subject site is located approximately 1km north east of the Tamworth BESS.	Noise may represent a cumulative impact during construction and operation, with the proposed facility operating 24 hours a day, seven days a week. The Tamworth BESS is also likely to operate 24 hours a day, seven days a week. Traffic by workers vehicles and deliveries/trucks during construction may also create a cumulative impact. Visual impact may also result in a cumulative impact due to the presence of additional BESS infrastructure in the locality. The cumulative impacts on biodiversity and agricultural land are also considered. All cumulative impacts are discussed below.
Kingswood BESS - 744 Burgmanns Lane, Kingswood NSW 2340	Development of a staged 500MW/1,000MWh BESS Stage 1 – 250MW and up to 500MWh of storage Stage 2 – Increase up to 500MW and 1000MWh of storage capacity	The proposed development is the same development type as the Calala BESS. The subject site is located approximately 1km north of the Kingswood BESS.	The cumulative impacts are similar to those identified above with the Tamworth BESS. Noise may represent a cumulative impact during construction and operation, with the proposed facility operating 24 hours a day, seven days a week. The Kingswood BESS is also proposed to operate 24 hours a day, seven days a week. Traffic by workers vehicles and deliveries/trucks during construction may also create a cumulative impact. Visual impact may also result in a cumulative impact due to the presence of additional BESS infrastructure in the locality. The cumulative impacts on biodiversity and agricultural land are also considered.

An assessment of the above cumulative impacts has been undertaken with regard to the Cumulative Impact Assessment Guidelines for State Significant Projects. The cumulative impacts of the project with consideration of existing developments, approved projects, future projects and any future development proposals, as identified in the above sections, are discussed under the subheadings below.

Visual

The proposed development is identified as having an overall moderate-low visual impact as discussed in Section 6.5 of this EIS and the LCVIA. Whilst the subject site is located outside the New England Renewable Energy Zone, the provision of large-scale renewable energy projects within the Tamworth Region has the potential to result in an altered landscape character notwithstanding the viewshed provided with this EIS.

Nearby the subject site is the Tamworth BESS which is located approximately 1km southwest of the subject site. There are no other known projects within a 5km radius of the subject site. Due to distance and scale of these projects, they are unlikely to be viewed in combination with the project.

The LCVIA indicates that all public viewpoints were shown to have moderate to low visual impact from the Calala BESS. All residential receivers are also assessed as experiencing no more than a moderate-low visual impact, with the exception of R9 at 795 Burgmanns Lane which was assessed as moderate impact. This dwelling is the closest non-associated residence to the project site, is elevated and has an obscured view over the project site by existing trees on the southern boundary that will be retained. Exposure to the proposal would be obscured partially by existing trees retained along the southern boundary, however, views of the taller components of the substation and BESS would be possible beyond the trees, changing the outlook from R9. Background vegetation, transmission lines and existing energy infrastructure present in the landscape would reduce contrast and conspicuousness of the proposal.

The size and magnitude of visual change is assessed to be moderate-low. The visual assessment notes the site has low visibility, limited by landform and vegetation, and is within an existing energy landscape based on the existing transmission towers in the vicinity.

The location of the proposed Tamworth BESS is unlikely to result in a significant cumulative visual impact on the residences on the eastern side of Burgess Lane, which are the closest residences to the subject site. As illustrated in the viewshed, the topography of the site limits opportunities for views from these dwellings (R5, R6, R7, R8, R16 and R9) toward the Tamworth BESS site as illustrated in Figure 45 below.

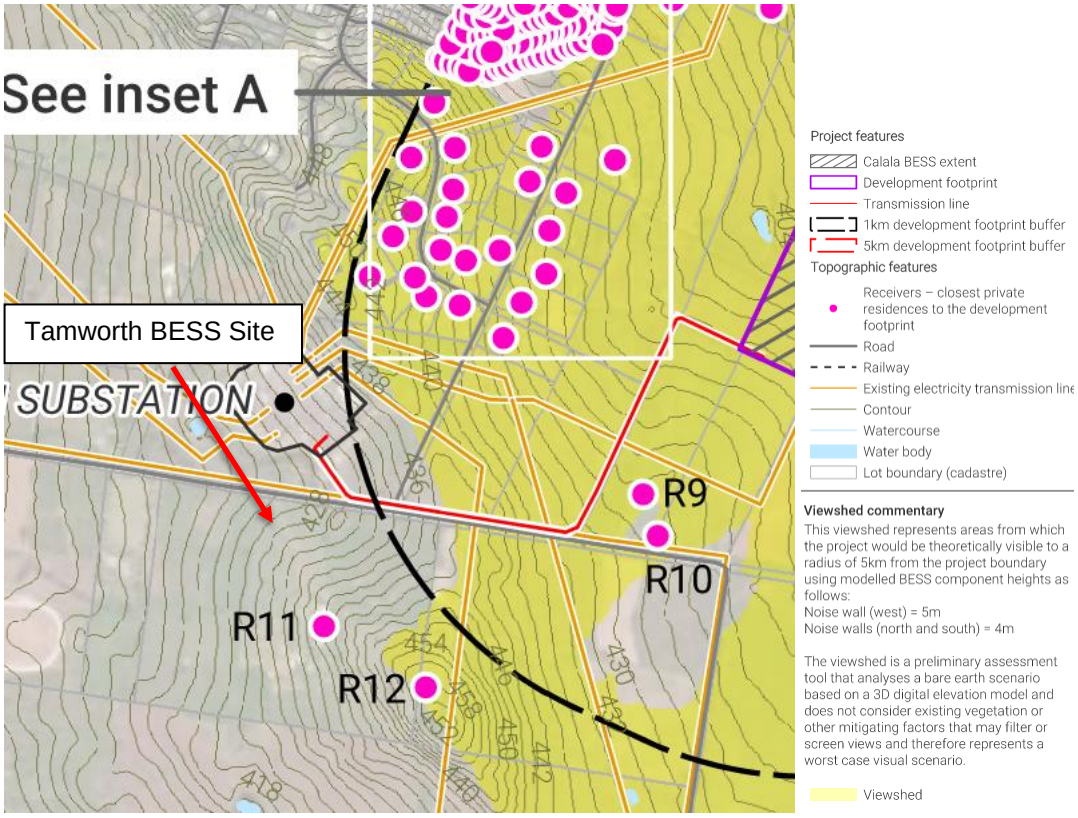


FIGURE 45 – VIEWSHED WITH NEARBY PROPOSED TAMWORTH BESS

Source: Envisage with markups by Mecone

On balance, adverse cumulative visual impacts are anticipated to be manageable due to the lower level of impact and the ability to effectively screen the infrastructure.

Noise

The proposed development is supported by a Noise and Vibration Assessment Report prepared by Marshall Day which provides an assessment of the proposed development with regard to noise and vibration generated by the proposal and the cumulative impacts of development in the locality.

The subject site is located in Calala and is located in close proximity to the Transgrid Tamworth 330 kV Substation which is located approximately 800 m southwest of the subject site. Whilst the current noise levels from operation of the substation facility have not been measured or quantified, the Noise Policy for Industry project amenity noise level is designed '*to protect against cumulative noise impacts from industry*' with modifications made to the recommended amenity noise level to account for noise contributions for existing industry. In this regard, a background noise survey has been conducted to evaluate existing noise levels at sensitive receptors in the vicinity of the Project.

In addition to the above, the report prepared by Marshall Day confirms the Noise Policy for Industry states "*Where the project amenity noise level applies and it can be met, no additional consideration of cumulative industrial noise is required".* As such, no further consideration is given to noise from the Transgrid Tamworth 330 kV Substation, and assessment of cumulative industrial noise under the Noise Policy for Industry is considered satisfied.

The proposed development is unlikely to result in any unacceptable adverse cumulative impact on the locality. As noted in the report submitted with this application, noise generated by the proposed development will be mitigated through the proposed noise attenuation walls on the western and northern elevations of the BESS and around the near-field barriers to HV transformers.

Implementation of effective mitigation measures, as outlined in Section 6.6.3, of this EIS will ensure the proposed development will not result in any adverse cumulative impact on the Calala locality and broader Tamworth LGA.

Traffic

The cumulative impacts associated with traffic generated by the proposed development, in addition to the existing and future traffic generation estimates, confirms that the proposal will not result in any significant adverse cumulative impact. At completion, the operation of the BESS will generate a total of 7 full time jobs, with these mostly being undertaken remotely. The instances in which a vehicle will attend the site are minimal, and as a worst-case scenario are considered on an average of one to two vehicles a day.

As discussed in Section 6.7 of the EIS and Section 6.9 of the TIA, consideration of the cumulative impacts during construction of the proposal have been considered. The Goonoo Goonoo Road duplication project is expected to commence main works in December 2024 which coincides with the proposed construction timeline for the proposed BESS. The proposed construction works associated with the Goonoo Goonoo Road duplication are unlikely to result in an adverse cumulative impact.

Consideration of the proposed Kingswood and Tamworth BESS are also unlikely to result in any adverse cumulative impact given the large number of vehicle movements are limited to a one-month period which is unlikely to coincide with the construction of the Kingswood and Tamworth BESS. This is considered reasonable in the existing context of the locality. Consultation will occur with Transport for NSW during the assessment of the application and prior to commencement of construction of the proposed development.

Based on the above, the cumulative impacts from a traffic perspective have been considered as part of this proposed development, and the proposal is unlikely to result in a significant impact on the functioning of existing traffic within the Calala locality and broader Tamworth LGA.

Biodiversity

The proposed development is located within an area that largely comprises exotic grassland and disturbed land due to agricultural activities undertaken in recent decades. As detailed in Section 6.1 of this EIS, the following residual biodiversity impacts are considered relevant to the construction of the project:

- Removal of 1.33 ha of *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* (BC Act) and *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* (EPBC Act).
- Removal of 0.06 ha of native vegetation comprising PCT 84_DNG.
- Removal of 1.08 ha of habitat for Bluegrass, Finger Panic Grass, Belson's Panic, Hawkweed and Austral Toadflax that have been assumed present.

This impact could result in direct loss of native flora and fauna habitat, potential over-clearing of habitat outside the development footprint, injury and mortality of fauna during clearing of fauna habitat and habitat trees, disturbance to stags, fallen timber, and bush rock.

There is potential for cumulative impacts on native vegetation over time which may cause a significant reduction in the extent of remnant patches. In particular, Box Gum Woodland habitats are already over cleared in the region and particularly the nearby New England Renewable Energy Zone. Cumulative impacts are considered best addressed by avoiding and minimising. Where avoidance is not possible

the impact of each contributing project is assessed on a case-by-case basis. Long term mechanisms like biodiversity offsetting are structured to address the ongoing impacts of multiple projects in a cohesive manner.

The Calala BESS project:

- Avoids impacts to biodiversity through site selection, iterative design, and utilising existing cleared Category 1 land where possible (refer to Figure 19).

- Avoids impacts to Box-gum Woodland Critically Endangered Ecological Community as much as possible through implementation of sensitive construction techniques such as directional boring beneath vegetation.

Where impacts cannot be avoided, an in-perpetuity biodiversity offset is generated. This means a 'like for like' area will be managed and protected to account for this clearing. On balance, the proposed development has considered the 'avoid and minimise' methodology and the residual impacts can be offset.

Agricultural

As identified in Section 5 of this EIS, the loss of agricultural land is identified as a concern by the local community. The cumulative impact of similar renewable energy projects can be considerable given most renewable energy projects proposed occur on private land. Small losses of agricultural land may be insignificant at a local level but may accumulate over time resulting in a significant reduction in the extent of land available for agricultural use.

The proposed development will result in a footprint of 8.9 hectares on existing rural residential land. As confirmed by the Agricultural Land Capability Statement prepared by Edge Land Planning, the site is currently occupied by rural residential land uses. As also identified by Edge Land Planning, the subject site is considered suitable for grazing and limited cropping, however, is insufficient for cattle grazing as most cattle farm range between 400 to 1,000 hectares. The soil typology and drainage lines results in the site being constrained for cropping.

The site is currently used for the keeping of horses. Prior to this, the site was used for the grazing of cattle. The previous owner of the site had a total of nine horses and used the property for training of some horses. Not all horses were kept on site, with some kept at another site for training. The previous owner did not gain their main source of income from the training of trotting horses on the site. Now that Equis has acquired the site, the land is vacant and not used for any of the purposes referred to by the previous owner. Based on the above, the proposal is not considered to result in a loss of quality agricultural land from a cumulative perspective.

6.14.4 Mitigation

Mitigation measures for cumulative impacts are discussed in the relevant sections and are summarised in Appendix D.

7 Justification of project

7.1 Design of project

The proposed development is for a BESS at 57 Burgess Lane, also known as 474 Calala Lane, Calala. The proposal includes the following:

- The construction and operation of a large-scale Battery Energy Storage System (BESS) with a capacity of up to 300 Megawatts (MW) and up to 1200 Megawatt hours (MWh) of battery storage capacity or up to 4 hours of storage duration.
- Installation of battery enclosures, inverters, DC and AC combiner boxes, transformers and auxiliary components.
- 33/330 kV switchyard
- Underground transmission cable connection between the BESS and the nearby TransGrid Tamworth 330 kV substation
- Ancillary elements including site access from Calala Lane, internal access roads and parking, control room and staff amenities, warehouse, stormwater and fire management infrastructure, utilities, signage, fencing, security systems, 4 and 5m high noise attenuation walls and landscaping.

The proposed development has been designed to meet the relevant planning provisions and guidelines.

7.2 Consistency with strategic context

The proposed development is suitable for the subject site and is located on a large, vacant property within close proximity to a substation. The site is located in the New England region in the north west which is identified as being a suitable location for renewable energy projects, particularly noting the proximity of the site to the New England Renewable Energy Zone.

The detailed assessment of the proposal against relevant strategies has been addressed in Section 2 of this EIS. The proposal contributes to the planning objectives outlined in the relevant district and region plans, and Tamworth Local Strategic Planning Statement.

7.3 Compliance relevant statutory provisions

The proposed development is permissible with consent and complies with the requirements of the relevant statutory planning controls. The detailed assessment of all relevant state and local environmental planning instruments are outlined in Sections 2 and 4 of this EIS. The assessment concludes as follows:

- The development has been addressed in accordance with the relevant objectives of the *Environmental Planning and Assessment Act 1979*.
- The EIS has been prepared in accordance with the issued SEARs required by Part 8 of the EP&A Regulations.
- The proposal is consistent with the principles of ecological sustainable development specified in Clause 193 of the *Environmental Planning and Assessment Regulation 2021* and will support delivery of an ecologically sustainable development.
- This development is categorised as SSD under the Planning Systems SEPP 2021.
- The site is zoned RU4 Primary Production Small Lots under the Tamworth Regional LEP 2010, and the proposed development is permissible in the prescribed zone and is consistent with the zone objectives.

The *Biodiversity Conservation Act 2016* has been considered and the application is accompanied by a Biodiversity Development Assessment Report accordingly.

7.4 Community views about the project

- The development has been through community consultation in various modes such as community session on 14 December 2022, various mail outs, email, telephone and website.
- The responses from various stakeholders raised the following concerns:
    - Health and safety including mental health and wellbeing of individuals directly and indirectly impacted by new BESS infrastructure,
    - Flooding, including accessibility of emergency services,
    - Property values and the perceived impact on property values in the local area,
    - Lack of information, including perceived lack of transparency on the project as technical reports were not provided as they were not available,
    - Visual impact of the BESS,
    - Traffic, including concern for the existing condition of local roads and hindrance on daily accessibility due to traffic impacts,
    - Conflict with rural aspect and lifestyle, including the perceived communities' sense of loss of place, rural lifestyle and quality of life,
    - Noise from the BESS disrupting resident's amenity during construction and operation, and
    - Loss of agricultural land for renewable energy.
- All stakeholder feedback has been considered as part of the design of the development.

7.5 Economic, social, environmental and cumulative impacts

The following are the potential social, economic and environmental impacts resulting from the proposed development.

<u>Social impacts</u>

- The proposed development includes opportunities for employment for Calala residents and the broader Tamworth LGA.
- The proposed development contributes to employment diversity within the Tamworth LGA through provision of renewable energy infrastructure as an emerging theme within the rural areas of NSW.
- The development may result in impacts on local character, traffic, aboriginal heritage, health and safety in the event of a hazard, noise and the perceived impact on property values. Each of these have been addressed through implementation of the recommended mitigation measures in the SIA provided with this EIS.

<u>Economic impacts</u>

- The proposed development will provide significant benefits including jobs throughout construction and operation of the BESS.
- The proposal will contribute to the provision of renewable energy resources and infrastructure in a suitable location.
- Cheaper household electricity costs.
- Total economic investment exceeding $30m
- Generates 170 total jobs during construction.

- Generates 7 permanent jobs during operation.
- Direct and indirect purchases in the local economy.

Environmental impacts

- Impacts on biodiversity have been avoided and minimised wherever possible, with appropriate management and mitigation measures adopted to further minimise any adverse impacts.
- The proposed development will not result in any adverse impacts on Aboriginal or European heritage.
- The proposed development incorporates appropriate mitigation measures to ensure the development complies with the relevant noise criteria to minimise any adverse impacts on nearby sensitive receivers.
- The proposed development complies with the requirements of Planning for Bush Fire Protection 2019 through the implementation of the recommendations in the Bushfire Assessment Report. The proposal will also not result in any increase in risk of fire on nearby residential properties.

7.6 Compliance monitoring and communication

Compliance of the development with the key statutory controls and conditions of consent will be monitored and communicated with all project staff by the development and project managers. The various management and mitigation measures outlined throughout the EIS ensure appropriate monitoring and communication is maintained throughout the construction and operational phases of the project.

7.7 Key uncertainties

The various components of the proposed development and the consultant reports provided to support the discussions and assessment in this EIS result in no uncertainties associated with the proposal.

7.8 Ecologically sustainable development

The proposed development is able to be undertaken in a manner that is not in-consistent with the principles of ecologically sustainable development.

7.9 Public interest

7.9.1 Security and Reliability of the National Electricity Market

Calala BESS will utilise market leading grid-forming technology to provide an equivalent 1800MVA of essential system strength services and voltage support to contribute to a smoother energy transition and enhance system security when the thermal generation is not present. Equis has participated in Transgrid's EOI seeking non-network options from potential System Strength Contractors to address system strength requirements in NSW, the submission was based on actual simulations and PSSE studies performed by Aurecon to show how Calala BESS improves system strength at various nodes when deployed at the proposed location.

Grid-forming technology could provide both FCAS market services and virtual inertia to NSW grid by mimicking the behaviour of synchronous machines (i.e., coal generation), regulating the frequency during and post disturbances as well as regulation due to demand-supply imbalances within the grid. Moreover, Calala BESS with its inverter technology will unlock an additional 300MW/1200MWh renewable generation within the New England REZ by increasing the hosting capacity within that area and enable stable operation of the renewables.

7.10 Site suitability

The proposed development is suitable on the site for the following reasons:

- The proposal is not inconsistent with the zone objectives,
- The proposal is consistent with the relevant federal, state and local strategic planning for the site and broader locality,
- The proposal is consistent with the relevant statutory planning controls applying to the site and proposed development,
- The proposal is capable of managing and mitigating land use impacts as discussed throughout the various technical inputs provided in preparing this EIS,
- The proposal will not result in any adverse impacts on the environment; and
- There are no environmental constraints on or around the site of such significance as to preclude the proposal.

As such, the subject site is considered suitable for the proposed development.

8 Conclusion

The Project involves the construction and operation of a large-scale BESS facility at 57 Burgess Lane, also known as 474 Calala Lane, Calala, which will provide a storage capacity of up to 300MW and discharge capacity of 1200MWh. The BESS will connect to the Transgrid 330kV Tamworth substation via underground transmission cables through several properties and crossing Burgess Lane. The project will involve the installation of the batteries and associated equipment, control room, switch room, switchyard/substation, water tanks, noise walls, fencing and access.

The proposed development is in accordance with the objectives identified in the strategic context of the site, particularly the Climate Change Act 2022, Environmental Planning and Assessment Act 1979, NSW Electricity Infrastructure Roadmap, NSW Electricity Strategy, AEMO 2022 Integrated System Plan and other policy framework discussed in Section 2 of the EIS. The development also complies with the statutory requirements as discussed in Section 4 of the EIS, noting the proposed development is permissible in the RU4 zone in accordance with Section 2.36(1) of the Transport and Infrastructure SEPP.

The project has been carefully designed and sited to minimise environmental impacts in consultation with the local community and relevant stakeholders. The residual environmental and social impacts identified throughout the EIS and technical assessments will be managed through the mitigation and management measures summarised in Appendix D.

The project will be developed on land that is not environmentally sensitive and the impacts will be managed and mitigated to a low level. The development will not result in significant impacts on the environment, or the local community and these impacts will be significantly outweighed by the strong strategic and economic benefits the project will deliver. The Project will:

- Deliver economic benefits to regional and local communities through the generation of 170 construction and 7 operational jobs,
- Economic investment to the local and regional economy exceeding $30m; and
- Contributes to the strategic direction of various levels of government through the provision of renewable energy infrastructure.

The project represents a positive addition to the local and wider NSW economy. Through the implementation of proposed mitigation and management measures, it is considered that this project is consistent with the objectives of the EP&A Act, is in the public interest and suitable for approval.

Appendices

9 Appendices

Appendix A – SEARs Compliance Table

Appendix B – Statutory Compliance Table

Appendix C – Engagement Report

Appendix D – Mitigation Measures

Appendix E – Architectural Plans

Appendix F – Detail Survey

Appendix G – Civil Engineering Concept Plan

Appendix H – Biodiversity Development Assessment Report

Appendix I – Aboriginal Cultural Heritage Assessment

Appendix J – Historical Archaeological Impact Statement

Appendix K – Archaeological Report

Appendix L – Land Use Conflict Risk Assessment

Appendix M – Agricultural Land Capability Study

Appendix N – Landscape Character and Visual Impact Assessment

Appendix O – Noise and Vibration Assessment

Appendix P – Transport Impact Assessment

Appendix Q – Water Management Report

Appendix R – Preliminary Hazards Analysis

Appendix S – Bushfire Report

Appendix T – Preliminary Site Investigation

Appendix U – Social Impact Assessment

Appendix V – Waste Management Plan

Appendix W – Land and Soil Capability Assessment

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