Wellington South Battery Energy Storage System

Amendment Report

Prepared for AMPYR Australia Pty Ltd

July 2023

Wellington South Battery Energy Storage System

Amendment Report

AMPYR Australia Pty Ltd

J210534 RP1

July 2023

Version	Date	Prepared by	Approved by	Comments
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V2	25 July 2023	Samantha Hayes	Claire Burnes	

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25 July 2023

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Executive Summary

AMPYR Australia Pty Ltd (AMPYR) and Shell Energy Operations Pty Ltd (Shell) propose to develop and operate the Wellington Battery Energy Storage System (the project), located approximately 2.2 km north-east of the township of Wellington in the Dubbo Regional Council local government area (LGA) and within the New South Wales (NSW) Government declared Central-West Orana Renewable Energy Zone (CWO REZ).

The project incorporates a large-scale battery energy storage system (BESS) with a discharge capacity of 500 megawatts (MW) and a storage capacity of 1,000 megawatt hours (MWh), along with connection to the Wellington substation (and associated upgrade works) and associated ancillary infrastructure to facilitate transfer of energy to and from the electrical grid.

The project will comprise the following components:

- Construction and operation of electrical infrastructure, including:
  - lithium-ion (Li-ion) batteries inside battery enclosures
  - power conversion systems (PCS) incorporating inverters and transformers
  - an aboveground or underground transmission line and connection to the switchyard of the Wellington Substation and associated easement
  - an on-site substation comprising two 330 kilovolt (kV) transformer bays and ancillary infrastructure
  - cabling and collector units.
- Upgrade of the TransGrid Wellington Substation, which may include installation of an additional 330 kV switch bay with power transformers, including switchyard bench extension to the south of the existing bench and relocation of security fencing.
- Construction/upgrade and maintenance of ancillary infrastructure and mitigative features, including:
  - an upgrade to the existing site access so that the site access will be via Twelve Mile Road (currently at the intersection of Goolma Road and Twelve Mile Road) to facilitate safer connection to roadway network and to facilitate the entry of larger construction vehicles
  - upgrades to existing access tracks
  - control and office building and associated parking
  - drainage and stormwater management
  - security fencing, lighting and closed-circuit television
  - connection to utilities (telecom, sewerage, etc.)
  - an Asset Protection Zone (APZ)
  - noise attenuation/acoustic barriers (wall/retaining wall and batter or earth mounds) four metres in height along all sides of the BESS facility
  - planted landscaping around the BESS facility.

Construction of the project will be Monday to Friday 7:00 am to 6:00 pm and Saturday 8:00 am to 1:00 pm. The BESS will operate 24 hours a day, 7 days a week and be operated remotely. The operation of the project is expected to commence from 2025 for a period of approximately 20 years, at which point the project will be extended or decommissioned. Once the project reaches the end of its investment and operational life, the project infrastructure will be decommissioned and removed from the site.

The proposed amendments presented in this report include:

- an amended site access, which connects to the north-east of the project onto Twelve Mile Road
- an updated transmission connection layout which connects the project to the TransGrid Wellington Substation
- a refined BESS layout to allow for appropriate separation between BESS subunits.

The proposed amendments are explained in detail in Section 3.1.

This Amendment Report outlines the assessment of the potential impacts associated with the proposed amendments. The justification of the project overall is articulated in the EIS (EMM 2022) and is unchanged by the proposed amendment. This includes consideration of the Commonwealth and NSW government strategic planning and policy objectives, impacts to the community and environment, and enhancing the security of the State's electricity supply.

The proposed amendments are consistent with the relevant objects of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and the principles of ecologically sustainable development (ESD) and will not significantly change the nature of the project originally proposed.

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1 Introduction

1.1 Background

AMPYR Australia Pty Ltd (AMPYR) and Shell Energy Operations Pty Ltd (Shell) (the proponent) propose to develop and operate the Wellington Battery Energy Storage System (the project). This involves the development of a large-scale battery energy storage system (BESS) with a discharge capacity of 500 megawatts (MW) and a storage capacity of 1,000 megawatt hours (MWh). The project also incorporates an on-site substation and connection infrastructure to facilitate transfer of energy to and from the electrical grid, along with associated ancillary infrastructure, as described in Section 1.2.

The site proposed to be developed is located within the Dubbo Regional Council local government area (LGA) at 6,773 Goolma Road at Wuuluman, on land zoned RU1 Primary Production and SP2 Infrastructure under the Dubbo Local Environment Plan (LEP). It will be located directly adjacent to the TransGrid owned Wellington Substation and is approximately 2.2 km north-east of the township of Wellington and 44 km south-east of the township of Dubbo. The project will incorporate either overhead or underground transmission line and upgrade works to Wellington substation in the adjoining TransGrid owned landholding (Lot 1 DP 1226751).

The local context is shown in Figure 1.1 and the project overview is shown in Figure 1.2.

The site is located within the New South Wales (NSW) Government declared Central-West Orana Renewable Energy Zone (CWO REZ) and will complement nearby existing and proposed renewable energy generation assets, including the Wellington Solar Farm (located opposite Goolma Road), Uungula Wind Farm and the proposed 3 gigawatt (GW) of additional generation to be delivered as part of the CWO REZ, by smoothing out fluctuations in electricity supply from these new intermittent power sources, and providing system security and other network services. In operation, the project will be one of the largest battery storage projects in NSW and will contribute to the overall storage capacity and reliability of the National Electricity Market (NEM). The project also supports state and Commonwealth emission commitments by facilitating renewable energy input into the grid network.

1.2 Original project

The project will involve the following components:

- Construction and operation of the BESS compound, comprising up to 6,200 pre-assembled battery enclosures housing lithium-ion battery packs and related control equipment, transformers and inverters with a peak maximum generation capacity of 500 MW/1,000 MWh.
- Construction and operation of an on-site BESS substation, comprising two 330 kilovolt (kV) transformer bays, 33/0.440 kV auxiliary transformers, and an auxiliary services building to house supporting equipment and systems.
- Connection to the adjoining Wellington Substation by way of an underground or aboveground transmission line and associated easement.
- Upgrade of the TransGrid Wellington Substation, which may include an additional 330 kV switch bay with power transformers, including switchyard bench extension to the south of the existing bench and relocation of security fencing.
- Ancillary infrastructure to facilitate construction and operation of the project, including a new access road, a washdown bay for incoming vehicles, and a control and office building.

The project also involves a subdivision in order to separate the BESS from the remainder of the site, which will continue to be used for cropping and grazing.

Construction of the project is expected to commence in April 2024, subject to project approval, labour and equipment availability.

Operation of the project is expected to commence from 2025 for a period of approximately 20 years, at which point the project will be extended or decommissioned. Throughout its operational life, certain components and technologies may be replaced and/or upgraded, however such works are unlikely to be intensive. The BESS will operate 24 hours a day, 7 days a week and be operated remotely, with regular infrastructure maintenance undertaken onsite.

1.3 Proposed amendments

The proposed amendments presented in this report include:

- an amended site access, which connects to the north-east of the project onto Twelve Mile Road
- an updated transmission connection layout, which connects the project to the existing TransGrid Wellington Substation
- a refined BESS layout to allow for appropriate separation between BESS subunits.

The proposed amendments are explained in detail in Section 3.1.

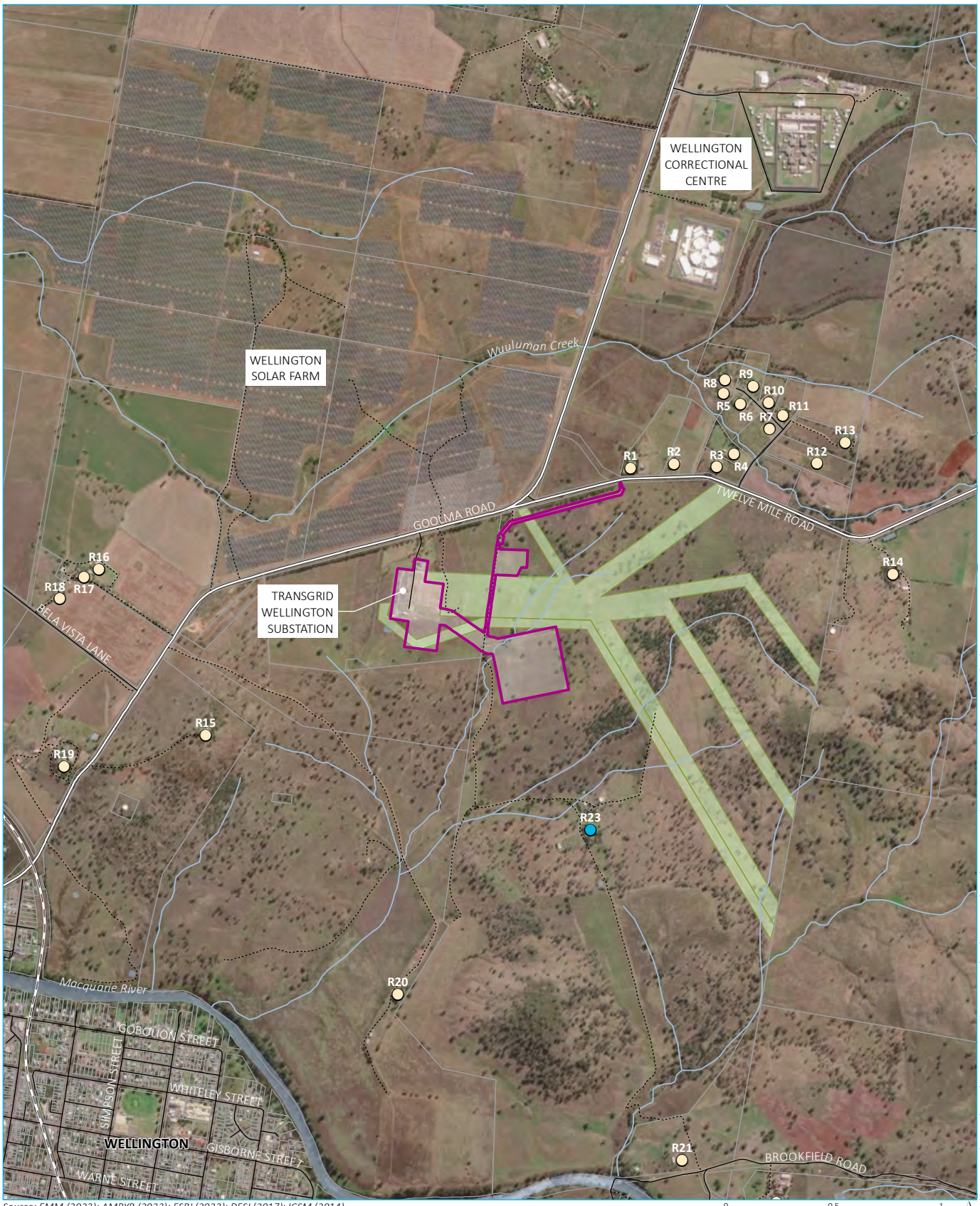
1.4 The applicant

AMPYR is wholly owned by AGP Sustainable Real Assets, an asset management group that finances, develops and operates sustainable real assets with an aim to drive a net zero greenhouse gas emissions future.

AMPYR's team has over 10 years' experience developing renewable energy projects, mostly large-scale onshore wind and solar but also including battery storage and hydro. AMPYR is presently developing five battery storage facilities internationally with a combined capacity of up to 1,190 MW (AMPYR 2022).

The Applicant details are as follows:

- Applicant name: AMPYR Australia Pty Ltd.
- Australian Business Number (ABN): 68 630 312 015.
- Address: 36–38 Young Street, Sydney NSW 2000.
- AMPYR has partnered with Shell to deliver the project.



Source: EMM (2023); AMPYR (2023); ESRI (2023); DFSI (2017); ICSM (2014)

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GDA 1994 MGA Zone 55

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KEY

- Development boundary
- Rail line
- Major road
- Minor road
- Vehicular track
- Watercourse/drainage line
- Waterbody
- Cadastral boundary
- Freehold easement

Receivers

- Non-project residential receivers
- Project participating landowner

Local context

Wellington Battery Energy Storage System
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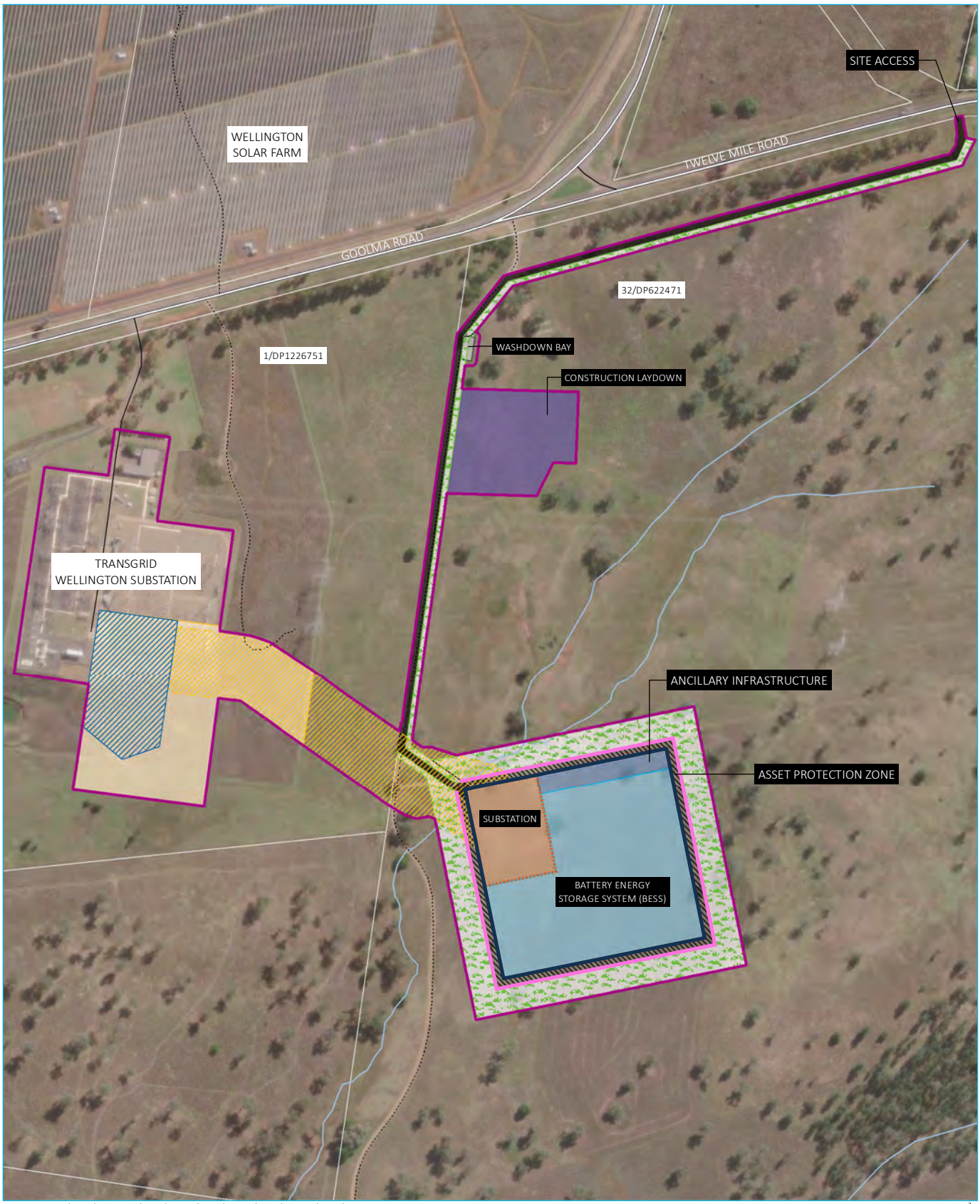
Figure 1.1

EMM creating opportunities



Source: EMM (2023); AMPYR (2023); ESRI (2023); DFSI (2017); ICSM (2014)

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Development
BESS infrastructure

Project
BESS units
Substation
Ancillary infrastructure (carpark, office, control room)
Indicative asset protection zone (10 m)
Transmission corridor
Indicative landscaping (post construction)

Indicative location of noise bund
Indicative TransGrid substation upgrade core infrastructure area
Indicative TransGrid substation upgrade disturbance area
Washdown
Construction
Access road

Existing environment
Major road
Minor
Vehicular track
Watercourse/drainage line
Cadastral boundary

Project overview

Wellington Battery Energy Storage System
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Figure 1.2

EMM
creating opportunities

2 Strategic context

2.1 Site and surrounds

As noted in Section 1.1, the project is located in the Dubbo Regional LGA on Goolma Road, approximately 2.2 km north-east of the township of Wellington and 44 km south-east of Dubbo (see Figure 1.1). The locality surrounding the project contains a variety of landscapes within an agricultural setting. Most of the local and sub regional setting has been cleared for grazing and/or cultivation. There are no major National Parks, nature reserves, conservation areas or State forests close to the project. The closest State Park is Lake Burrendong State Park, approximately 20 km south-east of the site.

Land surrounding the project is relatively flat, apart from a hill approximately 600 m east of the project, which rises about 100 m above the majority of the site. The project is directly south of the Wellington Solar Farm and adjacent and east of the Wellington Substation (see Figure 1.2). The solar panels and related infrastructure of the Wellington Solar Farm and associated grid and transmission infrastructure is a prominent visual feature in the surrounding landscape.

There are a number of other renewable energy generation projects (either approved or proposed) within 5 km of the site including the Wellington North Solar Farm, Uungula Wind Farm and Maryvale Solar Farm.

The site is within the Macquarie River catchment and Macquarie River is approximately 2 km south-east of the site. There are several first and second order tributaries within the site. These unnamed watercourses drain to the south-east to the Macquarie River. Other prominent water features include Lake Burrendong approximately 20 km to the south-east of the site.

The land use zoning of the site in accordance with Dubbo LEP is RU1 Primary Production and SP2 Infrastructure.

There are 20 sensitive receptors, being rural properties, within 2 km of the site (see Figure 1.1). The nearest non-project sensitive receptor is R1, which is located at 59 Twelve Mile Rd. This receiver is setback approximately 800 metres (m) north-east of BESS infrastructure and on the opposite side of Twelve Mile Road in the vicinity of the site access.

Within Lot 32 DP 622471, there is a rural dwelling and farm (R23) setback approximately 500 m from the site. This property is a project participating landowner.

2.1.1 Site suitability

The site is suitable for the project for the following reasons:

- Close proximity to the Wellington TransGrid Substation – the BESS substation is proposed to be positioned approximately 300 m west of the Wellington TransGrid Substation thereby minimising transmission line distances and allows for the co-location of energy infrastructure.
- Compatibility with existing land uses and land use zoning – the project is compatible with surrounding land uses including agricultural land uses and renewable energy projects.
- Proximity to major transport links – the project is accessible via Twelve Mile Road and is in close proximity to the Mitchell Highway and township of Wellington.
- Project infrastructure will be positioned to provide a sufficient buffer to non-project related sensitive receivers, such that the nearest private residence is 800 m north-east of the BESS infrastructure.

The site is appropriately zoned and complies with and supports the regional and local strategic planning strategies which apply. On the basis of these factors, the site is considered an ideal location for the project.

2.2 Strategic planning framework

An overview of relevant policies, plans and strategies and how the project and proposed amendments align with these, is provided in Table 2.1. The key change to the strategic planning framework is that the *Central West and Orana Regional Plan 2041* was finalised in December 2022 following the submission of the of the EIS in October 2022 (EMM 2022).

Table 2.1 Alignment with strategic planning framework

Plan, policy or strategy	Description	Alignment with strategic framework
Commonwealth policy		
Large scale renewable energy target (LRET)	The Australian Government Clean Energy Regulator administers the LRET which 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 allow for energy dispatch during periods where intermittent generators are not generating energy.
Integrated System Plan 2022 (ISP)	The Australian Energy Market Operator (AEMO) publishes an inaugural ISP which is updated every two years. The 2022 ISP finds that the NEM must triple its overall generation and storage capacity if it is to meet the economy's electricity needs. The 2022 ISP also identifies the need for 46 GW/640 gigawatt-hour (GWh) of dispatchable storage capacity, efficiently operated and firm variable renewable energy into the future.	The project will contribute to the storage and dispatchability requirements and will therefore support the 2022 ISP.
Australia's Long-Term Emissions Reduction Plan	Australia's Long-Term Emissions Reduction Plan (Australian Government Department of Industry, Science, Energy and Resources 2021) aims at reaching a net zero economy through a technology-based approach, whilst protecting relevant industries, regions and jobs. It is informed by detailed modelling and analysis that confirms the ability for Australia to achieve net zero emissions by 2050. It identifies that storage technologies, like batteries, are critical to enable very high shares of renewables, ensure security and reliability, and acknowledges that energy storage technologies are essential for Australia to shift to lower emissions electricity systems over time.	The project will support the management of daily variations in solar and wind generation and will contribute short-term firming to the grid.

Table 2.1 Alignment with strategic planning framework

Plan, policy or strategy	Description	Alignment with strategic framework
NSW policy		
NSW Electricity Strategy (the strategy)	The strategy (DPIE 2019) is the NSW Government's plan for a reliable, affordable and sustainable electricity future that supports a growing economy and sets out an approach to respond to emerging challenges. The strategy recognises that where variable generators are unable to satisfy demand, other technologies that can provide electricity on demand (such as storage) is required. The strategy also identifies four strategic principles of which Principle 1 is relevant to the project which acknowledges renewables, firmed by dispatchable technologies such as storage, are the lowest cost form of reliable electricity generation and calls upon investment into these technologies to reduce electricity prices and ensure network reliability.	The Central-West Orana REZ is the first of numerous identified REZ's across the State to be coordinated by the Energy Corporation of NSW (EnergyCo NSW) under the strategy. It was formally declared by the NSW Government on 5 November 2021, encompassing the geographical areas around Dubbo and Wellington and is planned to deliver of the order of 3 GW of new network capacity by the mid-2020s.
NSW Electricity Infrastructure Roadmap (the Roadmap)	The Roadmap (DPIE 2020b) builds on the framework set out by the NSW Electricity Strategy (DPIE 2019) and sets out a rationale for the policies and programs that are specifically designed to attract and secure that large-scale investment in new electricity infrastructure. The Roadmap recognises the findings of the 2022 ISP which finds that by mid-2030, NSW could need up to 2.3 GW of storage with 4 to 12 hours of duration to maintain system reliability and security under most scenarios.	The project will contribute to this need for additional energy storage by providing peak capacity of up to 500 MW that can be dispatched as required to meet demand.
Net Zero Plan Stage 1: 2020-2030	The *Net Zero Plan Stage 1: 2020–2030* (DPIE 2020a) sets out how the NSW Government will deliver upon an objective to achieve net zero emissions by 2050 and has 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.
State plans		
Central West and Orana Regional Plan 2041	The *Central West and Orana Regional Plan 2041* (DPE 2022a) considers a 20 year timeframe with a focus on the next 5 years. This purpose of the plan is to guide land use planning decisions in the region by the NSW Government, councils and others to the year 2041.	The following objectives of the draft plan are relevant to the project: • Objective 2: Support the State's transition to Net Zero by 2050 and deliver the Central-West Orana Renewable Energy Zone. • Objective 18: Leverage existing industries and employment areas and support new and innovative economic enterprises.
Dubbo Local Strategic Planning Statement (Planning Statement)	Adopted in June 2020, the Planning Statement (Dubbo Regional Council 2020) provides a 20-year vision for the future growth within the Dubbo Regional LGA. The Planning Statement identifies twenty planning priorities for land use planning in the LGA over the next 20 years.	The following planning priorities are relevant to the project: • Planning Priority 3: Promote renewable energy generation. • Planning Priority 18: Develop resilience to climate change. • Planning Priority 19: Create an energy, water and waste efficient city. • Planning Priority 20: Protect and enhance rural lands.

Table 2.1 Alignment with strategic planning framework

Plan, policy or strategy	Description	Alignment with strategic framework
*Dubbo Regional 2040 Community Strategic Plan (*Strategic Plan)	The Strategic Plan (Dubbo Regional Council 2018) was developed as a requirement of the NSW Government's Integrated Planning and Reporting Framework. It provides the opportunity for local government to engage with communities to determine and plan community aspirations for their regions.	The Strategic Plan identifies five theme areas that are supported by strategies to reach desired outcomes. Of these, the following strategies have been identified as relevant to the project: • Infrastructure Strategy 2.1: Opportunities for use of renewable energy are increased. • Economy Strategy 3.5: The long term economic growth of the Local Government Area is realised. • Liveability Strategy 5.9: Environmental sustainability is a priority.

3 Description of amendments

3.1 Amendment summary

A comparison between the original proposed project and the proposed amendments is provided in Table 3.1. The proposed amendments are also shown on Figure 3.1, with an updated description of the amended project provided in Appendix A.

Table 3.1 Amended project summary

Aspect	Original project	Amended project
Project area		
Address and legal description	6773 Goolma Road, Wuuluman (BESS and transmission line) described as Lot 32 DP 622471 and 6909 Goolma Rd, Wuuluman (transmission line and Wellington Substation upgrade) described as Lot 1 DP 1226751.	No change.
Development boundary	The project will require a disturbance boundary of approximately 19 ha that will be required during project construction.	The development boundary has been amended to incorporate the amended project design and has increased to approximately 22 ha as illustrated in Figure 3.1.
Operational boundary	The project will have an operational footprint of approximately 13 ha (see Figure 1.2) in which permanent project infrastructure will be located.	No change.
Environmental constraints near the project area	The following constraints are present within the site: • nearby sensitive receivers, the closest of which being a resident along Twelve Mile Road (R1) approximately 800 m north-east of the site • the presence of a tributary to Macquarie River and associated riparian vegetation • the presence of native vegetation and its associated ecosystem and species values • a portion of the site is within a designated bushfire prone area. The project has been designed to avoid these constraints.	No change.
Physical layout and design		
Layout	The proposed BESS will generally comprise the following components: • lithium-ion (Li-ion) batteries inside battery enclosures • power conversion systems (PCS) incorporating inverters and transformers • an aboveground or underground transmission line to the Wellington Substation and associated easement • an on-site substation comprising two 330 kilovolt (kV) transformer bays and ancillary infrastructure • cabling and collector units • an Asset Protection Zone (APZ). The project layout showing these components is presented in Figure 1.2.	No change.

Table 3.1 Amended project summary

Aspect	Original project	Amended project
Mitigation measures	The project has been sited to avoid environmental constraints within or near the site while minimising distances to the TransGrid Wellington Substation. Key mitigation measures considered in the project design include: • avoidance of higher condition native grassland and woodland in project siting and selection of disturbance area • suitable APZs incorporated in design of proposed infrastructure and disturbance area • construction of noise attenuation/acoustic barriers (wall/retaining wall and batter or earth mounds) four metres in height to the north, east, south and west as a means of reducing potential noise impacts on nearby residential receivers • planted landscaping around project infrastructure to minimise visual impacts.	The updated mitigation measures are attached as Appendix C.
Ancillary infrastructure and upgrades	The project will include the following ancillary components and upgrades: • an upgrade to the existing site access (currently at the intersection of Goolma Road and Twelve Mile Road) to facilitate safer connection to roadway network and to facilitate the entry of larger construction vehicles, and removal of an existing tree on the opposite side of Goolma Road to improve sight distance at the intersection • upgrades to existing access tracks within the project boundary • connection to the switchyard in adjoining TransGrid Wellington substation • upgrade of the TransGrid Wellington Substation, which may include an additional 330 kV switch bay with power transformers (which may be installed as an alternative to the transformer bays being located on the BESS site), switchyard bench extension to the south of the existing bench and relocation of security fencing • control and office building and associated parking • drainage and stormwater management • ancillary infrastructure including security fencing, lighting and closed-circuit television • connection to utilities (telecom, sewerage, etc).	The proposed amendments to the project are discussed in Section 3.2. The updated project description can be found in Appendix A. There are no other changes to the remaining ancillary components.
Built design, materials and finishes	Project enclosure components and cabinets will be light in colour to assist with heat management and made of steel. The control and office building will be a prefabricated building comprising a lunch room, office and ablutions room. The building will be assembled onsite and built to a height of 5 m tall. The building will be made of Trimclad steel or similar and grey in colour. Upgrade of the Wellington substation will comprise an extension to the existing infrastructure elements on that site.	No change.

Table 3.1 Amended project summary

Aspect	Original project	Amended project
Design elements subject to change during detailed design	Detailed design for the project has yet to be completed. The following design elements may be amended throughout the detailed design process: • the layout of the BESS units and substation infrastructure • the transmission line alignment and arrangement (i.e. either above ground on steel lattice tension structures and poles or underground) • the control and office building (material, finishes) • works at the TransGrid Wellington substation and switchyard to accommodate project connection • the location of attenuation features (noise wall/bunds) and fencing.	The indicative transmission connection layout has been revised in consultation with TransGrid. The layout of the BESS has been refined in consultation with DPE – Hazards. This is discussed further in Section 3.2.2.
Plans and figures illustrating the layout and design in plan-view and cross section	An overview of the project layout is provided in Figure 1.2.	The proposed amendments are shown on Figure 3.1.
Specifications		
Discharge capacity	Up to 500 MW.	No change.
Storage capacity	Up to 1,000 MWh or two hours of maximum discharge capacity.	No change.
Typical operating cycle	One to two cycles per day on average assumed for assessment.	No change.
BESS compound components	Specific component requirements are subject to selection of the potential technology provider. The BESS compound will comprise: • 1,400–6,200 pre-assembled battery enclosures incorporating power conversion systems, thermal management systems, and safety systems • 150–300 inverters/transformers • ancillary infrastructure (e.g. electrical switchroom, a control and office building, security fencing). Battery enclosures will be approximately 3 m tall.	No change.

Table 3.1 Amended project summary

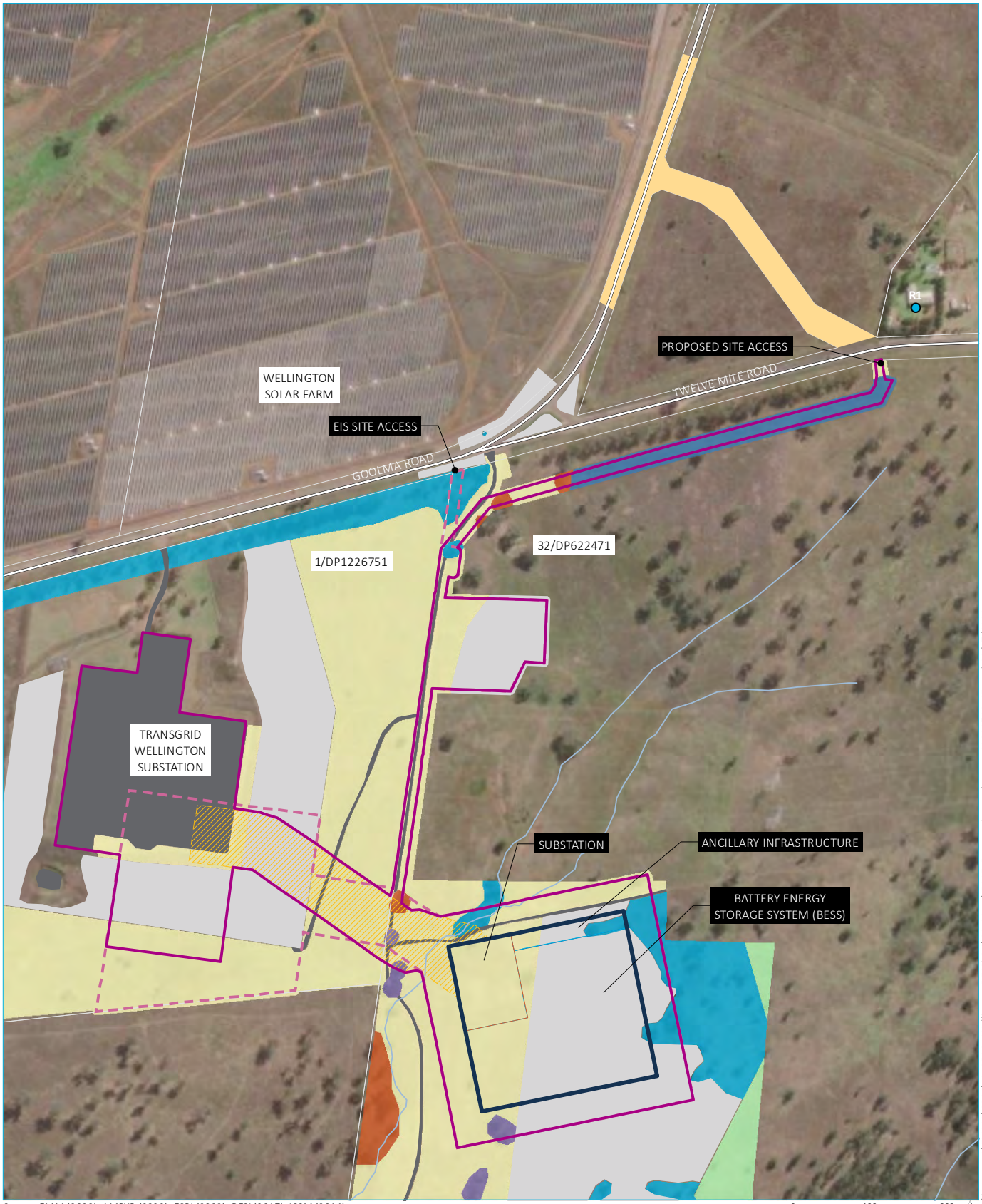
Aspect	Original project	Amended project
BESS substation components	An on-site substation will comprise: • two 330 kV transformer switch bays • 33kV indoor switchgear housed in portable substation containers. The tallest component of the substation will be the tips of bushings, approximately 11 m tall, however the bulk of the unit will be 9 m tall.	No change.
Connection infrastructure	An approximate 500 m 330 kV transmission line will extend from the BESS substation. TransGrid has advised that the Wellington Substation upgrade works may incorporate installation of one new 330 kV switch bay and multiple transformers, which may be installed in stages to coincide with the staged construction of the BESS should a staged approach be adopted.	No change.
Construction		
Capital investment value	$545 million AUD.	No change.
Construction activities	Construction of the project will involve: • civil and enabling works • structural, mechanical and electrical works • commissioning • demobilisation. The project is anticipated to take approximately 12–18 months to construct. Construction of the project will require an area of approximately 12 ha to facilitate the movement of plant and equipment (disturbance footprint). This area is illustrated in Figure 1.2. This area will incorporate a temporary laydown area near the site access for the storage of materials and infrastructure prior to installation at the site.	No change
TransGrid connection works	The project will connect to the Wellington Substation switchyard either via overhead or underground cables extending from the on-site substation. TransGrid has advised that the Wellington Substation upgrade works may incorporate installation of one new 330 kV switch bay and multiple transformers (which would be installed as an alternative to the transformer bays being located on the BESS site), and may be installed in stages to coincide with the staged construction of the BESS should a staged approach be adopted.	The indicative transmission connection layout has been revised in consultation with TransGrid. This is discussed further in Section 3.2.2.

Table 3.1 Amended project summary

Aspect	Original project	Amended project
Construction workforce	The project will create up to approximately 100 construction employment opportunities, many of which are expected to be sourced from the Dubbo region and other surrounding regional areas.	No change.
Construction scheduling and staging	Construction of the project will be undertaken over a minimum of 8 months and up to a maximum of 12–18 months under normal circumstances. Construction of the project may be undertaken as a single stage, or over two stages. For the staged construction scenario, Stage 1 would likely include 300 MW installed discharge capacity, all civil and enabling works, installation of batteries, one transformer and switchgear and associated structural, mechanical and electrical works, and connection to the substation. Stage 2 would consist of 200 MW, including installation of a second transformer and associated switchgear and batteries. It is anticipated that construction of Stage 2 would commence approximately 6–12 months following completion of Stage 1 works.	No change.
Construction hours	Construction of the project will be undertaken in accordance with the recommended standard/normal hours as defined by the *Interim Construction Noise Guideline* (DECC 2009) and *Draft Construction Noise Guideline* (EPA 2020) being: • Monday to Friday: 7:00 am to 6:00 pm • Saturday: 8:00 am to 1:00 pm • no works of Sunday and public holidays. Some exceptions may be made for low impact works and extraordinary circumstances.	No change.
Vehicle movements	The following maximum vehicle movements are predicted (subject to detailed design): • an average of up to 100 passenger vehicles per day (100 in and 100 out) during the construction works phase • an average of up to 60 heavy vehicles per day (60 in and 60 out) during the construction works phase • up to 20 oversize overmass (OSOM) vehicles during the construction works phase. Average daily heavy vehicle movements during the construction phase will generally be significantly lower than outlined above as the delivery of enclosures is anticipated to occur in batches.	No change.
Transport	Project components (batteries, enclosures, PCS components and substation components) will be transported to the site from Sydney/Newcastle via the Mitchell Highway and Goolma Road, an approved B-double route. Construction materials sourced from surrounding concrete batching plants and hard rock quarries. Construction labour, equipment and plant will likely be sourced from Dubbo and other surrounding regional centres.	While transport routes essentially remain the same, access to the site is proposed via a new site access off Twelve Mile Road and via the new upgraded intersection at Goolma Road and Twelve Mile Road. All traffic will enter the site via Twelve Mile Road, as discussed in Section 3.2.1.

Table 3.1 Amended project summary

Aspect	Original project	Amended project
Water demand	Water used directly on site for construction is estimated at 10 megalitres (ML) used predominantly for dust suppression purposes. Water sources will be confirmed during detailed design but are likely to include a combination to be sourced from bore water located on the participating landholder's land, municipal water supply (in agreement with the relevant authority) and/or imported water in portable tanks.	No change.
Operation		
Operational activities	Operation of the project will involve: • maintenance and cleaning of equipment • general office activities • waste removal.	No change.
Operational employment	The project will contribute to the employment of up to two employees during operation.	No change.
Operational life expectancy	The BESS is expected to operate for 20 years. At the end of operational life, this may be extended subject to the replacement of components.	No change.
Operational hours	The BESS will operate 24 hours a day, 7 days a week and be operated remotely.	No change.
Vehicle movements	Up to 4 trips per day (4 in-bound and 4 out-bound), compromising: • staff vehicles up to 3 per day (3 in-bound and 3 out-bound) • heavy vehicles up to 1 per day transporting replacement parts and equipment as required. Vehicle movements to and from the site will occur infrequently during operations, primarily for scheduled maintenance.	No change.
Decommissioning		
Decommissioning timing	At the end of the operational life of the BESS the project will either be replaced and upgraded or built infrastructure will be removed and the site rehabilitated.	No change.
Decommissioning works	Works undertaken during decommissioning will not exceed intensity associated with construction works and is expected to take up to 8 months.	No change.



Source: EMM (2023); AMPYR (2023); ESRI (2023); DFSI (2017); ICSM (2014)

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GDA 1994 MGA Zone 55

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KEY

- Development boundary
- EIS development boundary
- BESS infrastructure

Project components

- Substation
- BESS units
- Ancillary infrastructure (carpark, office, control room)
- Uungula Wind Farm road upgrade and intersection works extent
- Indicative transmission connection corridor
- Receptor

Existing environment

- Major road
- Watercourse/drainage line
- Cadastral boundary

Plant community type

- Not vegetated
- Non-native

PCT 266 | White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion (Box Gum Woodland CEEC (BC Act))

- Moderate (intact)
- Poor (intact)
- Low (intact)
- DNG (good)
- DNG (moderate)
- DNG (planted)

Proposed amendments

Wellington Battery Energy Storage System
Amendment report
Figure 3.1

EMM creating opportunities

3.2 Proposed amendments

3.2.1 Amended site access

Following exhibition of the EIS, ongoing consultation was undertaken with DPE, Transport for NSW (TfNSW) and Dubbo Regional Council (DRC) regarding the proposed site access via Goolma Road. Additional modifications were made to the concept design for the proposed access, however a suitable solution could not be reached and therefore an alternate option was required to be identified.

An alternate access via Twelve Mile Road was identified as the preferred option as illustrated in Figure 3.1. The internal access road will extend east of the washdown bay, parallel with Twelve Mile Road before connecting to Twelve Mile Road. This site access is proposed to be utilised for construction, operation and decommissioning of the project.

All traffic accessing the project site will enter via the new site access off Twelve Mile Road and a new intersection at Goolma Road and Twelve Mile Road that is to be constructed as part of the Uungula Wind Farm project approved as SSD 6687 on 7 May 2021. As required by Schedule 3, Condition B30 and Appendix 7 of SSD 6687, the Twelve Mile Road and Goolma Road intersection must be upgraded prior to the commencement of construction of the Uungula Wind Farm project (see Figure 3.1).

Assessment of the potential impacts associated with the amended site access is provided in Chapter 6.

3.2.2 Updated transmission connection layout

In consultation with TransGrid, the transmission connection layout has been subject to minor revision, as shown in Figure 3.1. This includes a slight realignment of the connection infrastructure and reduction in the disturbance area associated with the upgrade of TransGrid's substation. The corridor width remains the same, at 75 m, to allow for a sufficient buffer area either side of the transmission lines.

The development boundary has also been amended to include the full extent of the existing TransGrid Wellington Substation footprint (refer to Figure 3.1) as part of the further advancements with the detailed design of the project.

3.2.3 Refined BESS layout

In consultation with DPE – Hazards, the BESS layout has been refined to address the issues raised by DPE – Hazards in their EIS submission provided on 6 December 2022. DPE – Hazards requested verification that the BESS design accounted for appropriate separation between BESS subunits (containers, enclosures etc.) to prevent fire propagation.

The design was refined to ensure that the separation distances were appropriate in accordance with the codes and standards for BESS design, to the satisfaction of DPE – Hazards.

4 Statutory context

4.1 Commonwealth legislation

The *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities, heritage places and water resources which are defined as Matters of National Environmental Significance (MNES) under the EPBC Act.

Under the EPBC Act, an action that may have a significant impact on a MNES is deemed to be a 'controlled action' and can only proceed with the approval of the Commonwealth Minister for the Environment. An action that may potentially have a significant impact on a MNES is to be referred to the Commonwealth Department of Agriculture, Water and the Environment (DAWE) for determination as to whether or not it is a controlled action. If deemed a controlled action the project is assessed under the EPBC Act and a decision made as to whether or not to grant approval.

The project is unlikely to have a significant impact on a biodiversity MNES, and therefore will not be referred to DAWE and it is unlikely to be deemed a controlled action on the basis of impacts to biodiversity.

4.2 NSW State legislation

Table 4.1 details the NSW State legislation applicable to the project and the proposed amendment. Mandatory matters for consideration and an updated statutory compliance table can be found in Appendix B.

Table 4.1 Applicable NSW State legislation

Aspect/approval	Requirement	Any changes as part of amendment
Approval pathway for the project		
Approval pathway	Approval for the project is sought under Part 4, Division 4.7 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) which relates specifically to SSD. The relevant SEPP is the which declares the development proposed by the project to be SSD is the State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP), in particular, Section 2.6(1). The project is not permissible without development consent under Part 4 of the EP&A Act. The project meets the definition of 'electricity generating works and heat or co-generation' in accordance with Schedule 1 of the Planning System SEPP. The project has a capital investment value greater than $30 million. Therefore, the project is SSD and approval is sought under Part 4, Division 4.7 of the EP&A Act. The consent authority for SSD is either the Minister for Planning and Public Spaces or the Independent Planning Commission.	No change
Permissibility		
Permissibility	Section 2.6(1)(a) of the Planning Systems SEPP requires that for a project to be designated SSD it must be development that is not permissible without consent under Part 4 of the EP&A Act, by virtue of an environmental planning instrument. This introduces the permissibility test which is addressed in this section. The relevant environmental planning instrument is the Dubbo Regional Local Environmental Plan 2022 (Dubbo LEP). The project is located on land zoned RU1 Primary Production and SP2 Infrastructure under the Dubbo LEP. And is characterised as 'electricity generating works' under the Dubbo LEP. Electricity generating works and works that are ordinarily incidental or ancillary to purposes shown on the Dubbo LEP Land Zoning Map (i.e. the TransGrid substation which the project will connect to) are permitted with consent under the land zoned SP2. Under RU1, development for the purpose of electricity generating works is a prohibited land-use. Notwithstanding this prohibition the project is a permissible land-use with development consent by virtue of Section 2.36(1) of the State Environmental Planning Policy (Transport and Infrastructure) 2021 (Transport and Infrastructure SEPP) which permits electricity generating works on any land in the RU1 and SP2 zones. Therefore, the project is wholly permissible with development consent. The project also involves a rural subdivision. The Dubbo LEP Lot Size Map has a minimum lot size of 400 ha. Section 4.2(3) of the Dubbo LEP provides that land in an RU1 zone may, with development consent, be subdivided for the purpose of primary production to create a lot of a size that is less than the minimum size shown on the Lot Size Map in relation to the land.	No change

Table 4.1 Applicable NSW State legislation

Aspect/approval	Requirement	Any changes as part of amendment
Other approvals		
Consistent approvals		
An environment protection licence	Part 3, Section 48 of the *Protection of the Environment Operations Act 1997* (POEO Act) requires an environment protection licence to undertake scheduled activities at any premises. Schedule 1 (scheduled activities), clause 17 specifies 'general electricity works' with 'capacity to generate more than 30 megawatts of electrical power'. The project will have a capacity that is greater than 30 MW and will therefore require an environment protection licence.	No change
Approval under section 138 of the *Roads Act 1993* (Roads Act)	Approval will be required under section 138 of the Roads Act from the Council for works in, on or over a public road, or from the State to connect a road to a classified road.	No change
Other approvals		
Water access licence	No take from the surface water resource is proposed as part of the project, however, water extracted from the participating landholder's existing bore may be utilised to supplement potable water and imported water for construction use and operational irrigation. To use water from bores onsite, a Water Access Licence (WAL) would need to be obtained.	No change
Approvals not required under section 4.41 of the EP&A Act		
Water Management Act 2000	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* will not be required pursuant to Section 4.41 of the EP&A Act.	No change
Pre-conditions to being able to grant approval for the project		
State Environmental Planning Policy (Resilience and Hazards) 2021, section 4.6 – Remediation of Land	A consent authority must not consent to the carrying out of any development on land unless, if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out. The site is used incidentally for sheep grazing but has otherwise not been used for the grazing of livestock for a commercial purpose or for cropping. The land concerned is not: • within an investigation area • on land which development for a purpose referred to in contaminated land planning guidelines is being, or is known to have been, carried out • for residential, educational, recreational or child care purposes, or for the purposes of a hospital. The site is unlikely to be contaminated.	No change

Table 4.1 Applicable NSW State legislation

Aspect/approval	Requirement	Any changes as part of amendment
State Environmental Planning Policy (Transport and Infrastructure) 2021, Section 2.48 – Determination of development applications—other development	Development likely to affect an electricity transmission or distribution network: • The consent authority must give written note to the electricity supply authority for the area in which the development is to be carried out, inviting comments about potential safety risks, and must take into consideration responses received within 21 days. • The section applies to a development application including development carried out within or immediately adjacent to an easement for electricity purposes (whether or not the electricity infrastructure is existing), or immediately adjacent to an electricity substation, or within 5 m of an exposed overhead electricity power line. There is electricity infrastructure within the vicinity of the development boundary and the project will require connection to the electricity transmission network. TransGrid is the relevant electricity supply authority.	No change
State Environmental Planning Policy (Transport and Infrastructure) 2021, Section 2.118(2) – Development with frontage to classified road	The consent authority must not grant consent to development on land that has a frontage to a classified road unless it is satisfied that— a) where practicable and safe, vehicular access to the land is provided by a road other than the classified road b) the safety, efficiency and ongoing operation of the classified road will not be adversely affected by the development as a result of— i) the design of the vehicular access to the land, or ii) the emission of smoke or dust from the development, or iii) the nature, volume or frequency of vehicles using the classified road to gain access to the land c) the development is of a type that is not sensitive to traffic noise or vehicle emissions, or is appropriately located and designed, or includes measures, to ameliorate potential traffic noise or vehicle emissions within the site of the development arising from the adjacent classified road. The project will involve a relocation of site access and improvements (an auxiliary short left turn bay and a channelised right turn bay) to facilitate the safe access of vehicles.	Access to the site is proposed via Twelve Mile Road as per Section 3.2 and Figure 3.1.
Dubbo Regional Local Environmental Plan 2022 – Section 5.14(2) – Siding Spring Observatory	Before granting development consent for development on land to which this Plan applies, the consent authority must consider whether the development is likely to adversely affect observing conditions at the Siding Spring Observatory. The project will only require lighting at night for maintenance purposes. It is located relatively near to residential areas and the Wellington Correctional Facility and therefore unlikely to increase the impact on the observatory that is currently experienced from these other established land-uses.	No change

Table 4.1 Applicable NSW State legislation

Aspect/approval	Requirement	Any changes as part of amendment
Dubbo Regional Local Environmental Plan 2022 – Section 5.21(2) – Flood planning	Development consent must not be granted to development on land the consent authority considers to be within the flood planning area unless the consent authority is satisfied the development – a) is compatible with the flood function and behaviour on the land b) will not adversely affect flood behaviour in a way that results in detrimental increases in the potential flood affectation of other development or properties c) will not adversely affect the safe occupation and efficient evacuation of people or exceed the capacity of existing evacuation routes for the surrounding area in the event of a flood d) incorporates appropriate measures to manage risk to life in the event of a flood e) will not adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses. Flood risk from the nearby watercourse (Watercourse A) will be considered during detailed design.	No change
Dubbo Regional Local Environmental Plan 2022 – Section 7.1(4) – Terrestrial biodiversity	Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied— a) the development is designed, sited and will be managed to avoid a significant adverse environmental impact, or b) if a significant adverse environmental impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise the impact. The project is not within land identified on the Terrestrial Biodiversity Map; however a portion of Lot 32 DP 622471 is identified in the map. Biodiversity impacts due to the project are not significant and have been minimised during design of the project. Potential impacts will be managed through the implementation of management measures, and offsetting for residual impacts that cannot be avoided.	A revised BDAR has been prepared to provide an updated assessment of the amended project design (Appendix D). A summary of the updated impact assessment is provided in Chapter 6.

Table 4.1 Applicable NSW State legislation

Aspect/approval	Requirement	Any changes as part of amendment
Dubbo Regional Local Environmental Plan 2022 – Section 7.3(3) – Natural resource—riparian land and waterways	Development consent must not be granted to development unless the consent authority has considered the following matters— a) the potential adverse impact of the development on the following— i) water quality within the waterway, ii) aquatic and riparian habitats and ecosystems, iii) stability of the bed, shore and banks of the waterway, iv) the free passage of fish and other aquatic organisms within or along the waterway, v) the habitat of any threatened species, population or ecological community, b) the likelihood that the development will increase water extraction from the waterway for domestic or stock use and the potential impact of any extraction on the waterway c) a description of the proposed measures that may be undertaken to ameliorate any potential adverse impact. The project is within land identified on the Natural Resource—Water Map. Water impacts due to the project are not significant and will be minimised through detailed design and through the implementation of a suite of management and mitigation measures.	No change
Dubbo Regional Local Environmental Plan 2022 – Section 7.3(4) – Natural resource—riparian land and waterways	Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that the development is consistent with the objectives of this clause and— a) the development is designed, sited and managed to avoid potential adverse environmental impacts, or b) if a potential adverse impact cannot be avoided—the development will be managed to mitigate the adverse impact. The siting and design of the project has considered the nearby watercourse as a sensitive feature. Detailed design will consider how the project can be refined to avoid physical encroachment upon the waterway.	No change
Dubbo Regional Local Environmental Plan 2022 – Section 7.5 – Groundwater vulnerability	Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied— a) the development is designed, sited and will be managed to avoid a significant adverse environmental impact, or b) if a significant adverse environmental impact cannot be avoided—the development is designed, sited and will be managed to minimise the impact. The project is not expected to have any adverse impacts on groundwater levels or quality.	No change

4.2.1 Section 37 of the EP&A Regulation

Section 37 of the EP&A Regulation states that an applicant may, at any time before a development application is determined, apply to the consent authority for an amendment to the development application.

The application must be made on the NSW planning portal, be in the approved form and have regard to the *State Significant Development Guidelines* (DPE 2022b).

Section 37(6) of the EP&A Regulation requires that if the amendment will result in a change to the development, then the application must contain details of the change, including the name, number and date of any plans to enable the consent authority to compare the development with the development originally proposed.

The development application for the project has not yet been determined, therefore, amendments can be proposed for the project.

Following the exhibition of the EIS, in consultation with DPE, it was determined that an Amendment Report was required to present the proposed changes to the project.

This Amendment Report has therefore been prepared having regard to the *State Significant Development Guidelines* (DPE 2022b), in the approved form and will be submitted on the NSW Planning Portal. Details of the proposed change are provided in Chapter 3, and a consolidated updated project description is provided in Appendix A.

5 Community engagement

Further consultation with nearby receptors R1 and R15 (refer Figure 1.1), has been undertaken since the EIS exhibition.

Over January and February 2023, consultation with R15 was conducted to discuss the concerns raised in the comments provided in response to EIS exhibition. These concerns included noise, visual and electromagnetic radiation (EMR) impacts. Additional consultation was undertaken in July 2023 to provide further information from potential equipment suppliers regarding EMR impacts. The proposed amendments to the project will not increase impacts on R15. Further detail on these discussions is provided in Section 4.3.2 of the accompanying submissions report (EMM 2023a).

Between December 2022 and July 2023, consultation with R1 has continued to pursue an agreement for on-site noise mitigation measures. Details of the amended entrance way location have been shared with R1 as part of this ongoing consultation. Agreement has been reached prior to submission of this Amendment Report.

Further engagement with the wider community has not been undertaken as the proposed amendments are considered minor in nature. Community engagement for the EIS has been completed generally in accordance with the *Undertaking Engagement Guidelines for State Significant Projects* (DPIE 2021), as detailed in Chapter 5 of the EIS (EMM 2022).

6 Assessment of impacts

6.1 Potential impacts

The proposed amendments are likely to result in minimal additional surface disturbance activities that were not assessed as part of the modification report and supporting assessments. An assessment of the potential impacts of the proposed amendments are provided in Table 6.1.

Table 6.1 Assessment of impacts

Environmental consideration	Impact assessment
Biodiversity	The proposed amendments have resulted in a number of changed impacts including: • reduction of impact on PCT 266 – White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion; from 9.47 ha to 8.79 ha (0.68 ha reduction) • consideration of an additional vegetation zone; PCT266_DNGPlanted • assumption of Pink-tailed Legless Lizard as a candidate species requiring offsets • increased area of species polygon for Superb Parrot; from 5.41 ha to 6.74 ha • removal of Key's Matchstick Grasshopper as requiring offsets due to not finding the species during targeted surveys • exclusion of Golden Sun Moth as a candidate species (geographic constraint has been updated in the BAM-C) • an increase in indirect impact area; from 1.37 ha to 2.15 ha • an increase in ecosystem credits; from 27 credits to 41 credits • a change in species credits: – Superb Parrot: from 42 credits to 56 credits – Pink-tailed Legless Lizard: 36 credits – Key's Matchstick Grasshopper: 0 credits. **Mitigation measures have been updated to reflect threatened species presence within the site, including changes to:** • **BIO07 – this mitigation measure has been amended to avoid removal of occupied habitat within the breeding season (September to December) and the addition of exclusion zones.** • **BIO08 – this mitigation measure has been amended to reflect the presence of rocky habitat within the site and its relocation outside of the breeding season (December to late March).** • **An additional mitigation measure (BIO09) requiring pre-clearance surveys immediately prior to removal of logs, rocks and debris.** • **An additional mitigation measure (BIO16) for threatened species finds**
Aboriginal heritage	The proposed amendments will not result in any significant changes to the potential impacts to Aboriginal heritage associated with the construction and operation of the project. The amended site access road will extend in proximity of one additional isolated artefact (AHIMS 36-4-0220) that was identified through the EIS (EMM 2022) and is illustrated in Figure 6.1, however this site is outside the project area curtilage and would be avoided by the project. Registered Aboriginal Parties (RAPs) have been notified of the proposed amendments. The road alignment would be subject to further consideration where required as part of preparation of the Aboriginal Cultural Heritage Management Plan (ACHMP) as committed in the EIS. **No additional mitigation measures are required.**

Table 6.1 Assessment of impacts

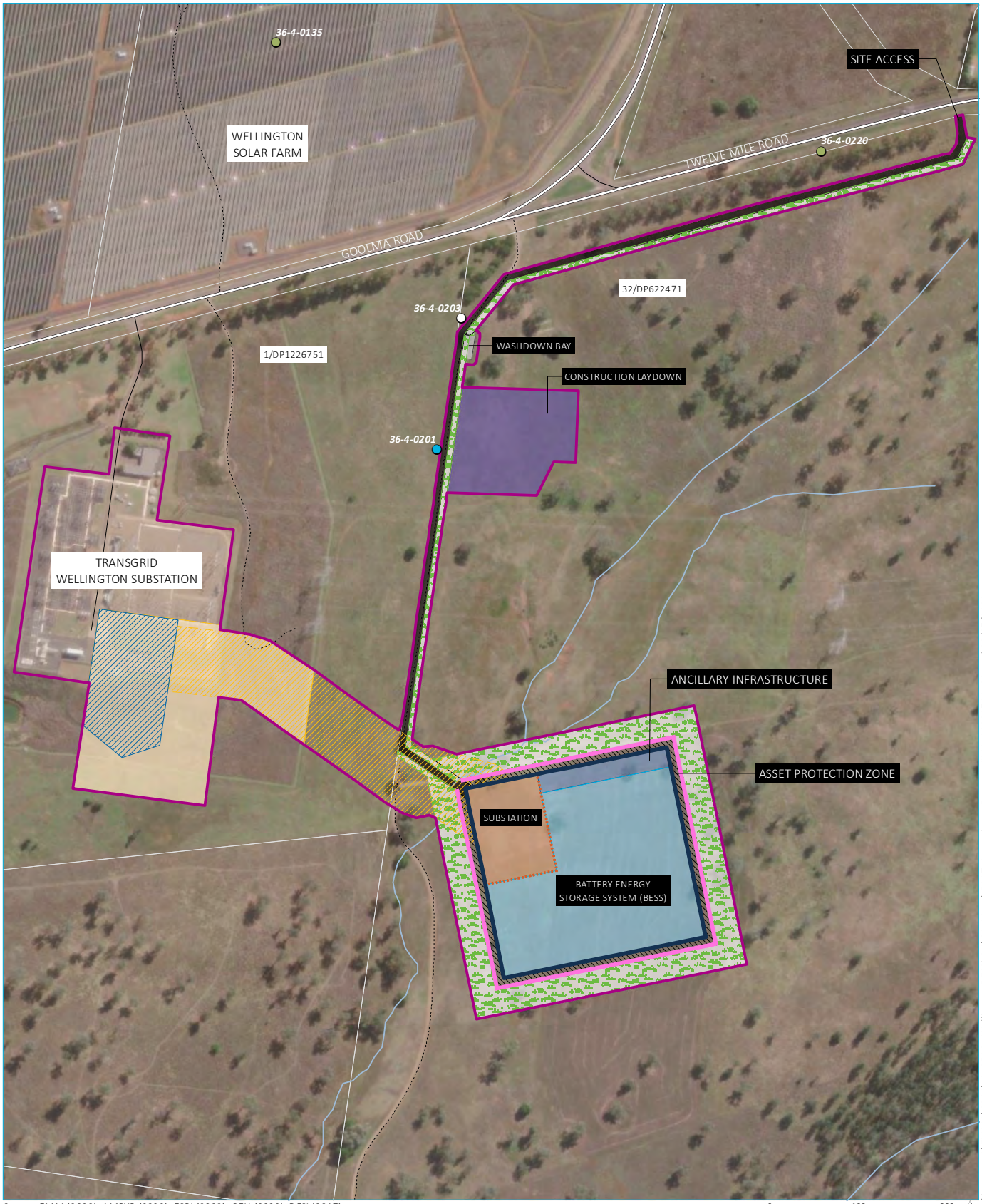
Environmental consideration	Impact assessment
Noise and vibration	The ANIA (Appendix D) considered the potential noise impacts associated with the alternative site access via Twelve Mile Road, including an assessment of construction noise and road traffic noise on Twelve Mile Road. The results of the assessment confirmed that there is a potential negligible increase (<1 dB) in construction noise at R1, with a total noise exceedance of the construction noise management level (NML) of 2 dB, which would be considered negligible. Review of road traffic noise levels utilising a worst case sound exposure level (SEL) has confirmed peak construction traffic would generate a cumulative $L_{Aeq,1hr}$ noise level well below the NSW RNP baseline criteria for local roads of $L_{Aeq,1hr}$ 55 dB. **No additional mitigation measures are required.**
Historic heritage	The closest historical heritage item to the project is Nanima Homestead which is located approximately 1 km to the west of the site. There will be no historical heritage items disturbed as part of the proposed amendments. **No additional mitigation measures are required.**
Hazard and risk	The proposed amendments will not result in any significant changes to the hazards and risks associated with the construction and operation of the project. **No additional mitigation measures are required.**
Land resources	Biophysical strategic agricultural land (BSAL) is defined as land with high quality soil and water resources capable of sustaining high levels of productivity. There is no BSAL within the proposed amendment areas. The land associated with the amendments is mapped as land and soil capability (LSC) classes 3 – moderate limitations; and 6 – very severe limitations. The amended project layout will not result in any material change to the assessed impacts on class 3 or 6 land as outlined in the EIS. **No additional mitigation measures are required.**
Social	The proposed amendments will not change the life of project operations, or construction and operational workforce requirements. Potential visual impacts to receptors as a result of the proposed amendments are discussed below. **No additional mitigation measures are required.**

Table 6.1 Assessment of impacts

Environmental consideration	Impact assessment
Traffic and transport	Construction of the project will occur in a single stage over a period of 12–18 months, or over two stages each between 12–18 months, commencing in April 2024. The worst case construction traffic scenario is associated with the single stage construction, which at its peak is expected to generate up to 100 construction personnel. Construction traffic includes passenger vehicles transporting constructions workers and heavy vehicles transporting project equipment. There will be an average of up to 100 passenger vehicles and 60 heavy vehicles per day, and a maximum of 80 passenger vehicles and 30 heavy vehicles during the peak hour, in the construction phase. There will be up to 20 OSOM vehicles in total during the construction phase. The cumulative impact assessment has considered the potential additional construction traffic associated with the Uungula Wind Farm and Wellington North Solar Farm projects (assuming both constructed concurrently in a single stage) as a worst case scenario. For the cumulative traffic impact assessment scenario, the mid-block capacity of the Goolma Road section west of the site would deteriorate from LOS B to LOS D. However, this will only be during the scenario where the peak construction activity for all three projects overlaps. The level of service will return to the baseline traffic conditions once peak construction period is over. As part of the Uungula Wind Farm development, the existing Goolma Road/Twelve Mile Road intersection will be relocated approximately 400 m to the north, which will improve traffic safety for all motorists. Austroads intersection turn treatment warrants were conducted for left and right turning traffic from the realigned Twelve Mile Road into the proposed site access. The assessment revealed that for the cumulative traffic impact assessment including Uungula Wind Farm construction traffic, a Basic Left Turn (BAL) and channelised short right turn treatment (CHR(S)) type turn treatments will be required on Twelve Mile Road. The proposed site access will have adequate sight distances to the left and right along Twelve Mile Road, which would meet the *Guide to Road Design* (Austroads 2021). **A BAL will be installed for left turning traffic from Twelve Mile Road westbound to the site access road and a CHR(S) will be required for right turning traffic from Twelve Mile Road southbound to the site access road.**
Visual	The site access amendment has the potential for visual impacts on R1, R2, and R3 (possibly R4-R7). During construction this would include additional traffic entering and leaving the site (and associated dust). It is unlikely that the access road will be seen by R15. During operation, the amount of traffic is anticipated to be minimal, and the visual impact would be reduced to the visibility of the new roadway from R1 and R2. The resulting visual impact rating is anticipated to remain low. There are no changes to visual amenity as a result of the amended transmission connection or refined BESS layouts. **No additional mitigation measures are required.**
Surface water and flooding	The amended site access is within the Wuuluman Creek catchment. Wuuluman Creek is an ephemeral third order watercourse located at the north of the site, across Goolma Road adjacent the Wellington North Solar Farm. The flood extent of Wuuluman Creek up to the 1% AEP event is predicted to remain on the northern side of Goolma Road/Twelve Mile Road, situated away from the project area (Footprint 2017). The proposed amendments are located within the Watercourse A catchment which is the catchment of an ephemeral second order watercourse, a tributary of the Macquarie River. There is no current flood information available for Watercourse A, however, this watercourse has relatively small catchment limited to the local topography. Wuuluman Creek and Watercourse A will not be impacted as part of the proposed amendments. **No additional mitigation measures are required.**
Air quality	The construction phase of the amended site access has the greatest potential for air pollutant emissions from activities such as bulk earthworks, land clearing and the movement of vehicles along unpaved roads. Construction of the updated transmission connection layout will not create any further impacts. Sources of operational phase air pollutant emissions from the amendments will be negligible. **No additional mitigation measures are required.**

Table 6.1 Assessment of impacts

Environmental consideration	Impact assessment
Contamination	There are no records of NSW EPA contaminated land within the proposed disturbance areas or buffer land. The site is located within the Dubbo Underground Petroleum Storage Systems (UPSS) Environmentally sensitive zone. There is no evidence to suggest potential contamination at the site. The site has been primarily used intermittently for grazing; there has been no development on the land, or animal dips or stockyards, waste dumps or fuel storage. There is no history of other land-use such as industrial and chemical works or storages; or land filling activities which are activities commonly associated with contamination at the site or in the surrounding area. **No additional mitigation measures are required.**
Waste	The amendments will not generate any additional waste than that outlined in the EIS (EMM 2022). All waste generated by the project will be minimised and managed through the implementation of construction environmental management plan (CEMP), as outlined in the EIS (EMM 2022). **No additional mitigation measures are required.**
Cumulative	The project is in the CWO REZ and there are a number of other renewable energy developments proposed in the vicinity of the project. The closest is Wellington NorthSolar Farm, the site access for which is located on the opposite side of Goolma Road approximately 1.5 km north of the project site. The proposed amendments will not result in significant additional construction activities than those previously proposed as part of the EIS (EMM 2022) and is therefore unlikely to contribute to additional cumulative impacts within the surrounding area. Any cumulative impacts contributed to by the project will be managed through the implementation of the management and mitigation measures outlined in Appendix C. **No additional mitigation measures are required.**



Source: EMM (2023); AMPYR (2023); ESRI (2023); OEH (2023); DFSI (2017)

0 100 200 m

GDA 1994 MGA Zone 55

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KEY

- Development boundary
- BESS infrastructure

Project components

- BESS units
- Substation
- Ancillary infrastructure (carpark, office, control room)
- Indicative asset protection zone (10 m)
- Transmission corridor
- Indicative landscaping (post construction)
- Indicative location of noise bund
- Indicative TransGrid substation upgrade core infrastructure area
- Indicative TransGrid substation upgrade disturbance area
- Washdown bay
- Construction laydown
- Access road

AHIMS site type

- Isolated artefact
- Not a site
- Undefined artefactual site

Existing environment

- Major road
- Minor road
- Vehicular track
- Watercourse/drainage line
- Cadastral boundary

AHIMS sites

Wellington Battery Energy Storage System
Amendment report
Figure 6.1

EMM creating opportunities

6.2 Additional assessments

6.2.1 Traffic and transport

An addendum traffic impact assessment (TIA) (EMM 2023b) has been prepared and is attached as Appendix D.1.

The purpose of the addendum TIA is to present and assess the proposed amendments to the site access via Twelve Mile Road. The addendum TIA also reviewed and assessed project-related construction daily and peak hour traffic volumes in consideration of the potential for staged or single phase construction, along with cumulative traffic volumes along the existing road network to determine whether there is sufficient road network capacity and to ensure the existing road network will be adequate to accommodate the additional traffic movements generated by the project.

6.2.2 Biodiversity

An updated BDAR (EMM 2023c) has been prepared and is attached as Appendix D.2.

The purpose of the updated BDAR is to address the issues raised in submissions and to provide a complete updated assessment of the amended project design in accordance with the relevant legislation requirements and guidelines. The updated BDAR provides:

- description of the biodiversity values of the study area
- assessment of the likelihood that threatened species and communities (threatened biodiversity) listed under relevant the NSW *Biodiversity Conservation Act 2016* (BC Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) could occur in the study area
- documentation of the strategies implemented to avoid and/or minimise impacts of the project on threatened biodiversity
- assessment of the residual threatened biodiversity impacts, after avoidance and minimisation strategies have been implemented
- provision of environmental safeguards to mitigate threatened biodiversity impacts during construction and operation.

6.2.3 Noise and vibration

An addendum noise impact assessment (EMM 2023d) (ANIA) has been prepared and is attached as Appendix D.3.

The purpose of the ANIA is to compare the potential noise impacts from the design option considered in the EIS (access via Goolma Road) with the alternate access option via Twelve Mile Road. It considers both the changes to construction noise from the realignment, and road traffic noise on R1 from additional traffic on Twelve Mile Road. The assessment of the alternate access option also provided the opportunity to further refine the noise model to capture only construction vehicles on the site access road, rather than the full schedule of construction plant and equipment across the whole disturbance area.

7 Justification of the amended project

This chapter provides a justification and evaluation for the project as a whole having regard to the economic, environmental and social impacts of the project and the principles of ecologically sustainable development.

7.1 Summary

The transition from thermal generation (e.g. coal) to renewable generation (e.g. wind and solar) has radically altered the NEM and the need for energy storage to cater for the intermittent nature of renewable energy sources. The project will provide critically needed firming capacity to the grid while supporting a reliable and secure source of electricity to consumers and the local population. In operation, the Wellington BESS will be one of the largest in the state, capable of contributing up to 1,000 MWh of storage capacity in the NEM. The project will also provide benefits in the form of smoothing out energy spot prices and providing back-up power during network interruptions.

Development of the project in the proposed location will allow the proponent to leverage the sites close proximity to the existing Wellington Substation, thereby minimising transmission line requirements and cost. Further, it will allow for the co-location of similar grid infrastructure, minimising land use conflict. The site proposed to be developed offers a location that is low-lying, substantially shielded by topography and vegetation, and substantially buffered from privately-owned land and sensitive uses.

The project is consistent with relevant Commonwealth, State and local strategic plans and polices, in particular the *NSW Electricity Infrastructure Roadmap* (DPIE 2020b) which identifies that by mid-2030, NSW could need up to 2.3 GW of storage throughout the network. The project will contribute to storage requirements by delivering a battery capable of providing a peak capacity of up to 500 MW that can be dispatched as required to meet demand.

The project will have both impacts and benefits on the surrounding natural and built environments. The impacts have been investigated, are not predicted to be significant, and can be adequately managed through appropriate design, mitigation and management during construction and operation. On balance, it is recommended that the project should be approved.

7.2 Design development

The project has been designed to avoid and minimise impacts where reasonable and feasible. The principles of avoidance and minimisation were implemented through the siting of infrastructure which involved numerous technical specialists. Throughout the development of the project design, the proponent has sought to optimise the project in a manner that considers the surrounding environment, avoids or minimises impacts at sensitive locations, and maintains existing natural features where present.

7.3 Strategic context

The project is supported by Commonwealth and State plans and policies as described in Chapter 4. Further, the project is proposed to be constructed on land with suitable land use zoning.

Regional and local strategic plans do not mention energy storage explicitly but references the need to increase renewable energy generation in the region. The project will support these goals and targets by facilitating greater penetration of renewable energy at times when renewable energy facilities in the region are not actively generating electricity (e.g. during night time or during periods of low wind).

7.4 Statutory compliance

In accordance with the EP&A Act, Clause 1.3 sets out the Objects of the Act. The consistency of the project with the objects of the Act is considered in Table 7.1.

Table 7.1 Objects of the EP&A Act

Objective	Consistency of the project
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 the NEM. 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 Chapter 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 the potential impacts of it 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 TransGrid substation and Wellington Solar Farm. 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.	Wherever possible, impacts have been avoided and/or minimised through site selection and through design by minimising distances to the TransGrid substation and by avoiding impacts to riparian vegetation and woodland. The project will result in the following impacts: • loss of 8.79 ha of native vegetation and associated habitat for fauna species • loss of 8.79 ha of White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion CEEC listed under the BC Act • loss of up to seven hollow-bearing trees • indirect impact to a further 2.15 ha of native vegetation and associated habitat for fauna species and the White Box grassy woodland CEEC. Residual impacts will be compensated through implementation of the biodiversity offset scheme (BOS).
6. To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).	The project will not impact upon cultural or built heritage values as described in Section 6.1.
7. To promote good design and amenity of the built environment.	Potential noise, air quality, and visual impacts on sensitive receivers and the broader community have been fully assessed and described in Chapter 6.
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.

Table 7.1 Objects of the EP&A Act

Objective	Consistency of the project
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 (IPC) will be the consent authority. Despite this, Council, as the local government authority, has been regularly consulted throughout the planning phase of the project and preparation of the EIS, Response to Submissions and Amendment reports. 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.	There have been a range of engagement activities to inform the community about the project and to seek community (and other stakeholders) feedback. The EIS provides further detailed information regarding the project and its potential impacts. The EIS was placed on public exhibition by DPE, with community members able to make formal submissions. A report is being prepared in response to these submissions.

7.5 Consideration of community views

Community consultation was completed as part of the EIS. Feedback from the community was limited but included both positive and negative views on a range of topics. Interest in the project primarily came from residents within the community of Wellington.

Some stakeholders recognised the benefits of the project as well as the project's role in the electricity grid. In particular, stakeholders acknowledged the project as a source of local employment, particularly during construction. Stakeholders were interested in understanding how the technology works and the benefits the project could deliver in the community.

Some concerns were raised by community stakeholders regarding how potential environmental impacts and hazards will be managed. These matters included the potential for electromagnetic fields, fire hazards, noise, and safety impacts.

Following the EIS exhibition period, submissions were received from three community members – one in support, one provided comment and one objected to the project. These have been addressed in the *Wellington South Battery Energy Storage System: Submissions Report* (EMM 2023a).

7.6 Summary of project impacts

This EIS has considered the potential impacts associated with the project, as well as the need for the project and alternative development options. This section summarises the potential impacts and provides a justification for the project on environmental, economic and social grounds.

7.6.1 Environmental impacts

This EIS has assessed potential impacts to the biophysical environment which are summarised below:

- Physical impacts to biodiversity, heritage, land resources, and water:
    - Biodiversity impacts are associated with the loss of 8.79 ha of the White Box grassy woodland in the upper slopes of the NSW South Western Slopes Bioregion, a CEEC listed under the BC Act. This will result in the loss of 8.79 ha of native vegetation and associated habitat for fauna species. The project will result in the loss of up to seven hollow bearing trees. The BDAR predicts indirect impacts to a further 2.15 ha of native vegetation, associated habitat for fauna species and the White Box grassy woodland CEEC. Under the BAM, the project requires 41 ecosystem credits to offset impacts on native PCTs, 56 species credits for the Superb Parrot (*Polytelis swainsonii)* and 36 soecies credits for Pink-tailed Legless Lizard. The BDAR has also considered impacts on species and ecological communities listed under the EPBC Act. The project is not expected to result in significant impacts to the Superb Parrot or Pink-tailed Legless Lizard. A referral under the EPBC Act is not required, as the project is not considered to be a controlled action.
    - No impacts to Aboriginal cultural heritage or historic heritage are predicted.
    - Soil impacts are not predicted to be significant. The site subsoils have a high erosion potential, however if the recommended measures are implemented, then the erosion and subsequent sedimentation risk will be low with minimal residual impacts. At the end of the project design life, the site will be rehabilitated to a condition as near as practicable to the condition that existed prior to construction of the facility and in consultation with the landowner.
    - Water related impacts, including groundwater and surface water are not predicted to be significant. The project is not expected to have any requirements for surface water licensing, with stormwater reuse likely to be undertaken during construction. The final siting of the BESS infrastructure will be determined during detailed design, to be sited to avoid impacts to waterfront land.
- Amenity impacts including noise and vibration, traffic and transport, and visual:
    - Construction noise levels from the project are predicted to exceed noise management levels (NMLs) at a number of assessment locations by a negligible level (1–2 dB). An exceedance of 6 dB above NML at R1 closest to the site is predicted in the absence of specific additional mitigation. Noise monitoring during construction will be considered to determine if actual construction noise levels are above NMLs. Subject to the measured level of exceedance, availability of feasible and reasonable noise mitigation and management measures will be determined.
    - Operational noise has been assessed under adverse weather conditions and considering the actual operational utilisation of the BESS. Noise mitigation measures have been included in the modelling following the outcome of preliminary noise modelling indicating noise exceedances. Following the implementation of all feasible and reasonable mitigation options, the modelling has demonstrated noise compliance can be achieved for all assessment locations during day and night NPfI assessment periods. During the evening assessment period the potential for a moderate exceedance of 5 dB was predicted for R1 whilst a negligible 1 dB exceedance was identified for R15. All feasible and reasonable mitigation has been considered for R15, and considering the predicted level is negligible (1 dB) over the PNTL, no further mitigation is proposed.

- To address the residual noise exceedance at R1, negotiations have been undertaken between the applicant and the landholder for treatment to the dwelling (upgraded glazing and where necessary alternative ventilation) to ensure equivalent internal noise levels are achieved (-10 dB or more) below the relevant external PNTL. Agreement has been reached prior to submission of this Amendment Report.

- No impacts from construction vibration on nearby residents is predicted.

- Traffic impacts are not predicted to be significant. Traffic generation during the peak construction period vehicles will increase traffic on Goolma Road, which would result in the mid-block capacity of this road to decrease from LOS B to LOS D. However, this will only be during the unlikely scenario of peak cumulative construction activity, where development traffic overlaps with the peak development traffic of the nearby proposed Wellington North Solar Farm and Uungula Wind Farm projects. The level of service will return to the baseline traffic conditions once peak construction period is over. No material impacts are expected during operation of the project.

- The project has been designed to integrate with the surrounding environment to minimise visual impacts. Visual impacts arising from the project are not anticipated to be significant and landscaping will be implemented. Only one nearby receptor will experience a moderate visual impact due to it having elevated views into the site.

- Glint and glare impacts and light spill impacts are not anticipated.

• Hazards and risk associated with project:

  - Hazards and risks associated with the project are not predicted to be significant. Risks have been assessed through a Preliminary Hazard Analysis (PHA) (Sherpa 2022). The PHA concluded there no significant offsite impacts predicted from the operation of the project.

7.6.2 Economic impacts

The project will provide long-term livelihood benefits during operation. It will smooth out energy spot prices and provide energy security and reliability.

Economic benefits will also be generated during construction. It will make contributions to the regional economy in the form of annual direct and indirect purchases. The construction phase of the project is expected to require up to 100 construction personnel, the majority of which are expected to be generated in the Dubbo/Wellington region where regional and local residents have the required skills and experience.

7.6.3 Social impacts

The project will provide direct benefits to NSW overall, through providing firming capacity to the NEM. The project will also directly benefit the local area and regional area of Dubbo LGA. While the project has potential negative impacts, it is considered that these can be managed to acceptably low levels.

Mitigation and management strategies have been proposed for each of the identified potential social impacts to minimise negative consequences and to maximise social benefits for the local community.

7.6.4 Ecologically sustainable development

The principles of ecologically sustainable development (ESD) are outlined in Clause 193 of the EP&A Regulation and addressed in Table 7.2.

Table 7.2 Consideration of principles of ecologically sustainable development

Principle	Ecologically sustainable development principle	Evaluation of project impact against principle
Precautionary principle	The **precautionary principle**, namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by – (i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment (ii) an assessment of the risk-weighted consequences of various options.	During the project planning phase and preparation of the EIS and Amendment Report, experts in their respective fields have carefully considered environmental outcomes through the preparation of quantitative technical assessments, providing a high degree of certainty around the impacts that may arise from the project. The project has been designed with regard to the applicable of the precautionary principle and in response to legislation, policies, and guidelines to ensure that it does not pose an unacceptable risk to human health or the environment. Management measures have been proposed for all potential environmental impacts. Taking these measures into account, it is considered that there would be no threat of serious or irreversible damage to the environment. Therefore, the project is consistent with the precautionary principle.
Social equity including inter-generational equity	**Inter-generational equity**, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.	A range of mitigation measures are proposed that will minimise the impacts of the project during construction and operation. The project will improve the penetration of renewable energy by storing energy in the NEM. This will support a transition away from fossil fuel (coal and gas) generation and contribute to a net reduction in greenhouse gas emissions. After the end of the project's operational life, infrastructure at the site will either be replaced/upgraded or decommissioned and removed from the site. After decommissioning, the site will be rehabilitated and likely return to its previous use (cropping/grazing). Given the above, it is considered that the project supports inter-generational equity.
Conservation of biological diversity and maintenance of ecological integrity	**Conservation of biological diversity and ecological integrity**, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration.	The conservation of biological diversity and ecological integrity was a fundamental consideration in the development of the project. The BDAR was prepared to assess potential impacts of the project (Appendix D.2). Direct impacts to 8.79 ha of native vegetation or habitat for threatened species will occur as a result of the project. The project has been sited to minimise impact to biodiversity values where possible.

Table 7.2 Consideration of principles of ecologically sustainable development

Principle	Ecologically sustainable development principle	Evaluation of project impact against principle
Improved valuation and pricing of environmental resources	**Improved valuation, pricing and incentive mechanisms**, namely, that environmental factors should be included in the valuation of assets and services, such as— (i) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement (ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste (iii) established environmental goals should be pursued in the most cost effective way by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.	Project benefits are considered to outweigh the costs. The project will generate up to 100 jobs during construction and will continue to provide economic benefits to the local community through a smoothing in energy spot prices. The project will also improve the penetration of renewable energy in the grid, supporting a transition away from fossil fuel (coal and gas) generation, thereby contributing to a net reduction in greenhouse gas emissions. The proponent accepts the financial costs associated with all the measures required for the project to avoid, minimise, mitigate and manage potential environmental and social impacts.

7.7 How compliance will be ensured

A monitoring and management framework will be developed to enable the potential positive and negative impacts to be monitored over time. It is proposed that the monitoring and management framework identifies the following key aspects:

- track progress of mitigation and management strategies
- assess actual project impacts against predicted impacts
- identify how information will be captured for reporting to impacted stakeholders including landholders, communities and government on progress and achievements
- key performance indicators, targets and outcomes
- responsible parties
- mechanisms for ongoing adaption of management measures when required.

To ensure the effectiveness of the management measures for the identified positive and negative impacts, it is recommended that a continuous improvement approach be adopted allowing for the review and adaption of impacts, management measures and outcomes.

7.8 Conclusion

The project involves the development and operation of a large-scale BESS with a discharge capacity of 500 MW and a storage capacity of 1,000 MWh. The project will be within the NSW Government declared CWO REZ and will complement nearby existing and proposed renewable energy generation assets, including the Wellington Solar Farm, Wellington North Solar Farm and the Uungula Wind Farm, along with the proposed 3 GW of additional generation to delivered as part of the CWO REZ. The project will function to smooth out fluctuations in electricity supply from these new intermittent power sources, providing system security and other network services.

The project will provide environmental, social and economic sustainability benefits to NSW as the project will facilitate a deeper penetration of intermittent renewable energy within the NEM. At a regional level, the project will contribute to the regional economy through increases in direct and indirect business turnover, value add, household income and job creation.

The project will result in environmental and social impacts as identified throughout the EIS and this Amendment Report, which will be managed through the mitigation and management measures described throughout, such that the project will not result in significant environmental or social impacts.

The project will achieve the following overall benefits:

- alignment with Commonwealth, NSW electricity policies and strategies, and regional plans
- contribution to the overall storage capacity of the NEM and provide greenhouse gas benefits by increasing the surplus of electricity generated from renewable sources that are intermittent (such as solar and wind) and where previously gas-fired generation has supported peak demand
- improvements to network reliability by providing back-up power during network disruptions
- decreases to average prices by smoothing out price differences (i.e. by arbitraging electricity price differences during peak and off-peak periods).

On balance, it is considered that the project will provide long-term livelihood benefits.

The justification of the project overall is articulated in the EIS (EMM 2022) and is unchanged by the proposed amendment. This includes consideration of the Commonwealth and NSW government strategic planning and policy objectives, impacts to the community and environment, and enhancing the security of the State's electricity supply.

The proposed amendments are consistent with the relevant objects of the EP&A Act and the principles of ESD and will not significantly change the nature of the project originally approved.

References

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DPE 2022a, *Central West and Orana Regional Plan 2041*, NSW Department of Planning and Environment.

DPE 2022b, *State Significant Development Guidelines – Preparing an Amendment Report,* NSW Department of Planning and Environment.

DPIE 2019, *NSW Electricity Strategy*, NSW Department of Planning, Industry and Environment.

DPIE 2020a, *Net Zero Plan Stage 1: 2020–2030*, NSW Department of Planning, Industry and Environment.

DPIE 2020b, *NSW Electricity Infrastructure Roadmap*, NSW Department of Planning, Industry and Environment.

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Dubbo Regional Council 2018, *Dubbo Regional 2040 Community Strategic Plan*.

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EMM 2022, *Wellington South Battery Energy Storage System Environmental Impact Statement*.

EMM 2023a, *Wellington South Battery Energy Storage System: Submissions Report*.

EMM 2023b, *Wellington South Battery Energy Storage System: Addendum Traffic Impact Assessment.*

EMM 2023c, *Wellington South Battery Energy Storage System: Biodiversity Development Assessment Report.*

EMM 2023c, *Wellington South Battery Energy Storage System: Addendum Noise Impact Assessment.*

EPA 2020, *Draft Construction Noise Guideline,* NSW Environment Protection Authority.

Sherpa 2022*, Preliminary Hazard Analysis*.

Appendix A
Updated project description

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A.1 Updated project description

The project will comprise the following components:

- Construction and operation of electrical infrastructure, including:
  - Li-ion batteries inside battery enclosures
  - PCS incorporating inverters and transformers
  - an aboveground or underground transmission line and connection to the switchyard of the Wellington Substation and associated easement
  - an on-site substation comprising two 330 kV transformer bays and ancillary infrastructure
  - cabling and collector units.
- Upgrade of the TransGrid Wellington Substation, which may include installation of an additional 330 kV switch bay with power transformers, including switchyard bench extension to the south of the existing bench and relocation of security fencing.
- Construction/upgrade and maintenance of ancillary infrastructure and mitigative features, including:
  - an upgrade to the existing site access so that the site access will be via Twelve Mile Road (currently at the intersection of Goolma Road and Twelve Mile Road) to facilitate safer connection to roadway network and to facilitate the entry of larger construction vehicles
  - upgrades to existing access tracks
  - control and office building and associated parking
  - drainage and stormwater management
  - security fencing, lighting and closed-circuit television
  - connection to utilities (telecom, sewerage, etc.)
  - an APZ
  - noise attenuation/acoustic barriers (wall/retaining wall and batter or earth mounds) four metres in height along all sides of the BESS facility
  - planted landscaping around the BESS facility.

Construction of the project will be Monday to Friday 7:00 am to 6:00 pm and Saturday 8:00 am to 1:00 pm. The BESS will operate 24 hours a day, 7 days a week and be operated remotely. The operation of the project is expected to commence from 2025 for a period of approximately 20 years, at which point the project will be extended or decommissioned. Once the project reaches the end of its investment and operational life, the project infrastructure will be decommissioned and removed from the site.

Appendix B

Updated statutory compliance table

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Table B.1 Updated statutory compliance

Statutory document	Reference	Requirement	Section
Commonwealth Acts			
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)		The EPBC Act provides the legal basis to protect and manage internationally and nationally important flora, fauna, ecological communities, heritage places and water resources which are deemed to be matters of national environmental significance (MNES). MNES, as defined under the EPBC Act, are: 1. world heritage properties 2. places listed on the National Heritage Register 3. wetlands of international significance listed under the Ramsar Convention 4. threatened flora and fauna species and ecological communities 5. migratory species 6. Commonwealth marine areas 7. Great Barrier Reef Marine Park 8. nuclear actions (including uranium mining) 9. water resources, in relation to coal seam gas or large coal mining development. Under the EPBC Act, actions that will, or are likely to, have a significant impact on a MNES are deemed to be controlled actions and can only proceed with the approval of the Commonwealth Minister for the Environment. An action that may potentially affect a MNES has to be referred to DAWE for determination as to whether it is a controlled action. No MNES listed above have been recorded or found within the vicinity of the site. However, MNES that may be relevant to the project are: • threatened flora and fauna species and ecological communities • migratory species. The project will not significantly impact any of these MNES and the project has not been referred to DAWE.	Chapter 6 Assessment of impacts Appendix D.2 Updated BDAR

Table B.1 Updated statutory compliance

Statutory document	Reference	Requirement	Section
The *Commonwealth Native Title Act 1993* (NT Act)		The NT Act recognises and protects native title rights in Australia. It allows a native title determination application (native title claim) to be made for land or waters where native title has not been validly extinguished, for example, extinguished by the grant of freehold title to land. Applications for compensation for extinguishment or impairment of native title rights can also be made. All native title claims are subjected to a registration test and will only be registered if claimants satisfy a number of conditions. A register of native title claims is maintained by the National Native Title Tribunal. Proposed activities or development that may affect native title are called 'future acts'. Claimants whose native title claims have been registered have the right to negotiate about some future acts, including mining and granting of a mining lease over the land covered by their native title claim. Where a native title claim is not registered, a development can proceed through mediation and determination processes, though claimants will not be able to participate in future act negotiations. There are no active claims encompassing the site.	Chapter 6 Assessment of impacts

Table B.1 Updated statutory compliance

Statutory document	Reference	Requirement	Section
NSW Acts			
Environmental Planning and Assessment Act 1979 (EP&A Act)	Section 1.3	Relevant objects of the Act.	Chapter 4 Statutory context Chapter 7 Justification of the amendment report
	Section 4.15(1)	1. Matters for consideration—general. In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application—	Noted
		a) the provisions of— (i) any relevant environmental planning instruments, and (ii) any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Planning Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved), and … (iii) any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4, and(iv) the regulations (to the extent that they prescribe matters for the purposes of this paragraph), … That apply to the land to which the development application relates,	Chapter 4 Statutory context
		b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality	Chapter 6 Assessment of impacts
		c) the suitability of the site for the development	Section 2.1.1 Site suitability
		e) the public interest	Chapter 5 Engagement

Table B.1 Updated statutory compliance

Statutory document	Reference	Requirement	Section
Biodiversity Conservation Act 2016 (BC Act)	7.14	2. The Minister for Planning, when determining in accordance with the *Environmental Planning and Assessment Act 1979* any such application, is to take into consideration under that Act 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 under that Act the likely impact of the proposed development on biodiversity values. 3. If the Minister for Planning decides to grant consent or approval and the biodiversity offsets scheme applies to the proposed development, the conditions of the consent or approval may require the applicant to retire biodiversity credits to offset the residual impact on biodiversity values (whether of the number and class specified in the report or other number and class). The residual impact is the impact after the measures that are required to be carried out by the terms or conditions of the consent or approval to avoid or minimise the impact on biodiversity values of the proposed development. 4. A condition to retire biodiversity credits is required to be complied with before any development is carried out that would impact on biodiversity values. If the retirement of particular biodiversity credits applies to a stage of the development, compliance with the condition for their retirement is postponed until it is proposed to carry out that stage of the development.	Chapter 6 Assessment of impacts Appendix D.2 Updated BDAR
Roads Act 1993	Section 138	Approval will be required under Section 138 of the Roads Act from the Council for works in, on or over a public road, or to connect a road to a classified road.	Chapter 4 Statutory context
Water Act 1912 and *Water Management Act 2000*		The NSW *Water Act 1912* (Water Act) and WM Act regulate the management of water by granting licences, approvals for taking and using water, and trading groundwater and surface water. The WM Act applies to those areas where a water sharing plan has commenced. Alternatively, if a water sharing plan has not yet commenced, the Water Act applies. The WM Act is progressively replacing the Water Act as relevant water sharing plans are introduced across the State. Water sharing plans have commenced for most of NSW. Licensing of monitoring bores continues under the Water Act until a regulation for aquifer interference gives a mechanism to approve these activities. Clause 4.41 (1g) of the EP&A Act exempts an SSD authorised by a development consent from requiring 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 WM Act. These exemptions apply to the project as it has been declared an SSD and therefore there is no requirement to obtain approvals under the WM Act, including water use, water management work or controlled activity approvals. No take from the surface water resource is proposed as part of the project, however, water extracted from the participating landholder's existing bore may be utilised to supplement potable water and imported water for construction use and operational irrigation. To use water from bores onsite, a WAL would need to be obtained.	Chapter 6 Assessment of impacts

Table B.1 Updated statutory compliance

Statutory document	Reference	Requirement	Section
Contaminated Land Management Act 1997 (CLM Act)		The CLM Act aims to promote the better management of contaminated land. The objectives of this Act are to establish a process for investigating and, where appropriate, remediating land areas where contamination presents a significant risk of harm to human health or some factor of the environment.	Chapter 6 Assessment of impacts
NSW Regulations			
Environmental Planning and Assessment Regulation 2021 (EP&A Regulation)	clause 50	1. A development application must— a) be in the form that is approved by the Planning Secretary and made available on the NSW planning portal, and b) contain all of the information that is specified in the approved form or required by the Act and this Regulation, and c) be accompanied by the information and documents that are specified in Part 1 of Schedule 1 or required by the Act and this Regulation, and d) be lodged on the NSW planning portal.	The EIS and this Amendment Report
	clause 77	Notice of development applications (1) As soon as practicable after a development application is lodged with the consent authority, the consent authority must— a) publish notice of the application on the consent authority's website, and b) give notice of the application to— (i) the public authorities (other than relevant concurrence authorities or approval bodies) that, in the opinion of the consent authority, may have an interest in the determination of the application (ii) in the case of a development application other than designated development—the persons that, in the opinion of the consent authority, own or occupy the land adjoining the land to which the application relates (unless the notice is in respect of an application for public notification development).	To be completed by the consent authority.

Table B.1 Updated statutory compliance

Statutory document	Reference	Requirement	Section
	clause 82	Additional requirements for State significant development 1. The Planning Secretary is to provide to an applicant for State significant development the submissions, or a summary of the submissions, received in relation to the application during the submission period. 2. The Planning Secretary may, by notice in writing, require the applicant to provide a written response to any issues raised in those submissions as the Planning Secretary considers necessary. 3. For the purposes of section 4.39(d) of the Act, the Planning Secretary is to make the following documents that relate to a development application for State significant development available on the NSW planning portal— a) the Planning Secretary's environmental assessment requirements under Part 2 of Schedule 2 b) the development application, including any accompanying documents or information and any amendments made to the development application c) any submissions received during the submission period and any response provided under subclause (2) d) any environmental assessment report prepared by the Planning Secretary e) any development consent or modification to a development consent f) any application made for a modification to a development consent, including any accompanying documents or information g) any documents or information provided to the Planning Secretary by the applicant in response to submissions.	To be completed by the Planning Secretary.

Table B.1 Updated statutory compliance

Statutory document	Reference	Requirement	Section
	schedule 2(6)	Form of environmental impact statement An environmental impact statement must contain the following information— a) the name, address and professional qualifications of the person by whom the statement is prepared b) the name and address of the responsible person c) the address of the land— (i) in respect of which the development application is to be made, or (ii) on which the activity or infrastructure to which the statement relates is to be carried out d) a description of the development, activity or infrastructure to which the statement relates e) an assessment by the person by whom the statement is prepared of the environmental impact of the development, activity or infrastructure to which the statement relates, dealing with the matters referred to in this Schedule f) a declaration by the person by whom the statement is prepared to the effect that— (i) the statement has been prepared in accordance with this Schedule (ii) the statement contains all available information that is relevant to the environmental assessment of the development, activity or infrastructure to which the statement relates (iii) that the information contained in the statement is neither false nor misleading.	The EIS

Table B.1 Updated statutory compliance

Statutory document	Reference	Requirement	Section
	Schedule 2(7)	Content of environmental impact statement: (1) An environmental impact statement must also include each of the following— a) a summary of the environmental impact statement b) a statement of the objectives of the development, activity or infrastructure c) an analysis of any feasible alternatives to the carrying out of the development, activity or infrastructure, having regard to its objectives, including the consequences of not carrying out the development, activity or infrastructure d) an analysis of the development, activity or infrastructure, including— (i) a full description of the development, activity or infrastructure (ii) a general description of the environment likely to be affected by the development, activity or infrastructure, together with a detailed description of those aspects of the environment that are likely to be significantly affected (iii) a full description of the measures proposed to mitigate any adverse effects of the development, activity or infrastructure on the environment (iv) a list of any approvals that must be obtained under any other Act or law before the development, activity or infrastructure may lawfully be carried out e) a compilation (in a single section of the environmental impact statement) of the measures referred to in item (d)(iv) f) the reasons justifying the carrying out of the development, activity or infrastructure in the manner proposed, having regard to biophysical, economic and social considerations, including the principles of ecologically sustainable development set out in subclause (4).	The EIS
Environmental Planning Instruments			
State Environmental Planning Policy (Planning Systems) 2021	Schedule 1, section 20	The project is SSD as it is a type of electricity generating works that has a capital investment value of more than $30 million.	3.1 Amendment summary

Table B.1 Updated statutory compliance

Statutory document	Reference	Requirement	Section
State Environmental Planning Policy (Resilience and Hazards) 2021	Section 3.7	Consideration of Departmental guidelines In determining whether a development is— a) a hazardous storage establishment, hazardous industry or other potentially hazardous industry, or b) an offensive storage establishment, offensive industry or other potentially offensive industry, consideration must be given to current circulars or guidelines published by the Department of Planning relating to hazardous or offensive development. The project is a type of hazardous industry.	Chapter 6 Assessment of impacts
	Section 3.12	Potentially hazardous or potentially offensive development. Matters for consideration by consent authority: • current circulars or guidelines published by the Department of Planning relating to hazardous or offensive development • whether any public authority should be consulted • a preliminary hazard analysis • any feasible alternatives • any likely future land use of surrounding land.	Chapter 6 Assessment of impacts
	Section 4.6	A consent authority must not consent to the carrying out of any development on land unless— a) it has considered whether the land is contaminated b) if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out c) if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.	Chapter 6 Assessment of impacts

Table B.1 Updated statutory compliance

Statutory document	Reference	Requirement	Section
State Environmental Planning Policy (Transport and Infrastructure) 2021	Section 2.48	Before determining a development application for development immediately adjacent to an electricity substation, the consent authority must— a) give written notice to the electricity supply authority for the area in which the development is to be carried out, inviting comments about potential safety risks b) take into consideration any response to the notice that is received within 21 days after the notice is given. There is electricity infrastructure within the vicinity of the development boundary and the project will require connection to the electricity transmission network. TransGrid is the relevant electricity supply authority	Section 3.1 Amendment summary Section 3.2.2 Updated layout Appendix A Updated project description
	Section 2.118(2)	The consent authority must not grant consent to development on land that has a frontage to a classified road unless it is satisfied that— a) where practicable and safe, vehicular access to the land is provided by a road other than the classified road b) the safety, efficiency and ongoing operation of the classified road will not be adversely affected by the development as a result of— (i) the design of the vehicular access to the land, or (ii) the emission of smoke or dust from the development, or (iii) the nature, volume or frequency of vehicles using the classified road to gain access to the land c) the development is of a type that is not sensitive to traffic noise or vehicle emissions, or is appropriately located and designed, or includes measures, to ameliorate potential traffic noise or vehicle emissions within the site of the development arising from the adjacent classified road. The project will involve a relocation of site access and improvements to Twelve Mile Road (a BAL and CHR(S)) to facilitate the safe access of vehicles.	Chapter 3 Description of amendments Appendix A Updated project description Appendix D.1 Addendum traffic impact assessment
State Environmental Planning Policy (Biodiversity and Conservation) 2021		Chapter 3 and Chapter 4 of this SEPP aims to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free living population over their present range and reverse the current trend of koala population decline. The development boundary supports potential Koala habitat. Consideration of impacts to the Koala is provided in the Biodiversity Development Assessment Report	Section 6.2.2 Biodiversity Appendix D.2 Updated BDAR
Dubbo Regional Local Environmental Plan 2010	clause 2.3(2)	The consent authority must have regard to the objectives for development in a zone when determining a development application in respect of land within the zone.	Section 2.1.1 Site suitability Chapter 4 Statutory context

Table B.1 Updated statutory compliance

Statutory document	Reference	Requirement	Section
	clause 4.2(3)	Rural subdivision Land in Zone RU1 Primary Production may, with development consent, be subdivided for the purpose of primary production to create a lot of a size that is less than the minimum size shown on the Lot Size Map in relation to that land.	Chapter 4 Statutory context
	clause 5.21(2)	Flood planning 2. Development consent must not be granted to development on land the consent authority considers to be within the flood planning area unless the consent authority is satisfied the development— a) is compatible with the flood function and behaviour on the land b) will not adversely affect flood behaviour in a way that results in detrimental increases in the potential flood affectation of other development or properties c) will not adversely affect the safe occupation and efficient evacuation of people or exceed the capacity of existing evacuation routes for the surrounding area in the event of a flood d) incorporates appropriate measures to manage risk to life in the event of a flood e) will not adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses. Flood risk from the nearby watercourse (Watercourse A) will be considered during detailed design.	Chapter 6 Assessment of impacts
	Clause 5.21(3)	Flood planning 3. In deciding whether to grant development consent on land to which this clause applies, the consent authority must consider the following matters— a) the impact of the development on projected changes to flood behaviour as a result of climate change b) the intended design and scale of buildings resulting from the development c) whether the development incorporates measures to minimise the risk to life and ensure the safe evacuation of people in the event of a flood d) the potential to modify, relocate or remove buildings resulting from development if the surrounding area is impacted by flooding or coastal erosion.	Chapter 6 Assessment of impacts

Table B.1 Updated statutory compliance

Statutory document	Reference	Requirement	Section
	Clause 7.2(3)	Terrestrial biodiversity 3. In deciding whether to grant development consent for development on land to which this clause applies, the consent authority must consider— a) whether the development is likely to have— (i) an adverse impact on the condition, ecological value and significance of the fauna and flora on the land (ii) an adverse impact on the importance of the vegetation on the land to the habitat and survival of native fauna (iii) the potential to fragment, disturb or diminish the biodiversity structure, function and composition of the land (iv) an adverse impact on the habitat elements providing connectivity on the land b) appropriate measures to avoid, minimise or mitigate the impacts of the development. Biodiversity impacts due to the project are not significant and have been minimised during design of the project. Potential impacts will be managed through the implementation of management measures, and offsetting for residual impacts that cannot be avoided.	Section 6.2.2 Biodiversity Appendix D.2 Updated BDAR
	Clause 7.2(4)	Terrestrial biodiversity 4. Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied— a) the development is designed, sited and will be managed to avoid a significant adverse environmental impact, or b) if a significant adverse environmental impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise the impact. Biodiversity impacts due to the project are not significant and have been minimised during design of the project. Potential impacts will be managed through the implementation of management measures, and offsetting for residual impacts that cannot be avoided.	Section 6.2.2 Biodiversity Appendix D.2 Updated BDAR

Table B.1 Updated statutory compliance

Statutory document	Reference	Requirement	Section
	Clause 7.3(3)	Natural resource—riparian land and waterways 3. Development consent must not be granted to development on land to which this clause applies unless the consent authority has considered the following matters— a) the potential adverse impact of the development on the following— (i) water quality within the waterway (ii) aquatic and riparian habitats and ecosystems (iii) stability of the bed, shore and banks of the waterway (iv) the free passage of fish and other aquatic organisms within or along the waterway (v) the habitat of any threatened species, population or ecological community b) the likelihood that the development will increase water extraction from the waterway for domestic or stock use and the potential impact of any extraction on the waterway c) a description of the proposed measures that may be undertaken to ameliorate any potential adverse impact. Water impacts due to the project are not significant and will be minimised through detailed design and through the implementation of a suite of management and mitigation measures (described in Appendix C).	Chapter 6 Assessment of impacts
	Clause 7.3(4)	Natural resource—riparian land and waterways 4. Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that the development is consistent with the objectives of this clause and— a) the development is designed, sited and managed to avoid potential adverse environmental impacts, or b) if a potential adverse impact cannot be avoided—the development will be managed to mitigate the adverse impact. The siting and design of the project has considered the nearby watercourse as a sensitive feature. Detailed design will consider how the project can be refined to avoid physical encroachment upon the waterway.	Chapter 6 Assessment of impacts

Table B.1 Updated statutory compliance

Statutory document	Reference	Requirement	Section
	Clause 7.5(3)	Groundwater vulnerability 3. In deciding whether to grant development consent to development on land to which this clause applies, the consent authority must consider— a) whether the development, including on-site storage or disposal of solid or liquid waste chemicals, will cause groundwater contamination or an adverse effect on groundwater dependent ecosystems b) the cumulative impact, including the impact on nearby groundwater extraction for potable water supply or stock water supply, of the development and other existing development on groundwater.	Chapter 6 Assessment of impacts
	Clause 7.5(4)	Groundwater vulnerability 4. Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied— a) the development is designed, sited and will be managed to avoid a significant adverse environmental impact, or b) if a significant adverse environmental impact cannot be avoided—the development is designed, sited and will be managed to minimise the impact. The project is not expected to have any adverse impacts on groundwater levels or quality.	Chapter 6 Assessment of impacts

Appendix C
Updated mitigation measures

EMM
creating opportunities

Table C.1 Mitigation measures

Impact/risk	ID	Measure	Timing
Biodiversity			
Removal of Box Gum Woodland and derived native grassland	BIO01	Retain vegetation where possible within the transmission line connection. Limit the removal of vegetation to necessary trees and trimming of branches.	Construction Post-construction
	BIO02	Locate the access of the BESS on most of the existing access track within the project boundary.	Design
	BIO03	Following construction, include species consistent with PCT 266 into landscaping and vegetation screens.	Post-construction
Removal of hollow-bearing trees	BIO04	Minimise removal of hollow-bearing trees which occur within the project boundary, where possible. A visual screening area is included in the project boundary, where efforts to retain the 7 remaining trees will be made. Although this is the aim of the proponent, impacts to hollow-bearing trees include the removal of the 7 trees within the subject land for the purpose of this assessment.	Design
	BIO05	Install 7 nest boxes or equivalent within the cadastral boundary of the site in remnant woodland. As a priority, the removed hollows should be retained to be re-installed on remnant trees within the site. Where this is not possible, nest boxes can be used.	Construction
Removal of potential habitat for native fauna (hollow-bearing trees) (for all species including the Superb Parrot)	BIO06	Pre-clearance surveys to be conducted prior to removal of hollow-bearing trees (at the locations specified in the BDAR).	Pre-construction
	BIO07	If the Superb Parrot is found to be utilising a hollow, removal of the hollow-bearing tree must be postponed until the breeding pair has left the hollow for the breeding season and no eggs or hatchlings remain in the hollow (September to December). An exclusion zone must be installed should the Superb Parrot be found within a hollow.	Pre-construction
Removal of logs, rocks (including embedded rocks) and debris from the subject land	BIO08	Retain hollow logs, all rocks and debris to be used post construction in remnant woodland. These will be relocated outside of the subject land (within the cadastral boundary) in the remnant woodland to the east, south and west to retain species habitat and connectivity. Avoid relocation of rocks during Pink-tailed Legless Lizard breeding season (December to late March).	Post-construction
	BIO09	Pre-clearance surveys to be conducted immediately prior to removal of logs, rocks and debris.	Pre-construction
Indirect impacts on White Box woodland to be retained	BIO10	Retained trees will be marked for their protection during construction, where required. Markings will be monitored and reapplied where necessary during construction.	Pre-construction
	BIO11	All workers to be made aware of ecologically sensitive areas and the need to avoid impacts. This includes adjacent native vegetation.	Pre-construction

Table C.1 Mitigation measures

Impact/risk	ID	Measure	Timing
Erosion and sedimentation to the indirect impact area	BIO12	Sediment controls, including fencing and sediments traps, should be installed in any areas where works will occur in proximity to low lying vegetation. This includes along the boundary of the unnamed watercourse.	Pre-construction
Weed introduction and spread	BIO13	Remove weeds prior to clearing. Weeds are to be stockpiled appropriately prior to removal from the subject land to avoid the spread of seed and other propagules.	Construction
	BIO14	Weed hygiene protocols are in place prior to entering the subject land. This includes wash-down procedures to all plant and machinery.	Construction
Disturbance	BIO15	Monitor dust levels and implement suppression strategies where required such as wetting down dirt roads or reducing vehicle speeds.	Construction
Threatened species finds	BIO16	Have a threatened species protocol; for managing threatened species which may be found on site during construction.	Pre-construction Construction
Ground disturbance	ACHA01	All site personnel should be made aware that there are registered Aboriginal sites within the vicinity of the project area and therefore must not undertake ground disturbance outside of approved areas. Appropriate signage and temporary fencing should be erected around AHIMS 36-4-0203 to ensure no inadvertent impacts occur to this site.	Prior to ground disturbance
Impact to known heritage items	ACHA02	Appropriate signage and temporary fencing should be erected around AHIMS 36-4-0203 to ensure no inadvertent impacts occur to this site.	Pre-construction

Table C.1 Mitigation measures

Impact/risk	ID	Measure	Timing
Reporting and record keeping	ACH03	Prior to ground disturbance, an Aboriginal cultural heritage management plan (ACHMP) must be developed by a heritage specialist in consultation with the Aboriginal stakeholders and consent authority to provide the post-approval framework for managing Aboriginal heritage within the project area. The ACHMP should include the following aspects: • A workshop between the archaeologists and the RAPs prior to undertaking the ACHMP to develop the approach to the document as requested by WVWAC during the ACHA review period. • Liaise with the RAPs in developing suitable visual strategies to minimise impacts of the project to the broader cultural landscape (e.g. cultural plantings, screening, paint styles, etc). • Process, timing, and communication methods for maintaining Aboriginal community consultation and participation through the remainder of the project. • Description and methods for undertaking further Aboriginal heritage assessment, investigation and mitigation of any areas of the project area that have changed following completion of the Aboriginal heritage assessment and/or during the final design and construction phases of the project. • Procedures for managing the unexpected discovery of Aboriginal objects, sites and/or human remains during the project and delivered through an Aboriginal Cultural Heritage Induction Program developed and delivered by the RAPs onsite to ensure culture, heritage and artefactual materials are identified and managed appropriately. • Procedures for the curation and long-term management of cultural materials if recovered as part of unexpected finds. • Processes for reviewing, monitoring, and updating the AHMP as the project progresses.	Pre-construction
Reporting and record keeping	ACH04	The Construction Environment Management Plan (CEMP), or equivalent, should reinforce how the cultural landscape is considered throughout the project and detail the rehabilitation of the project area. This should be undertaken in consultation with the RAPs. The CEMP should be distributed to the RAPs for their records.	Pre-construction
Consultation	ACH05	Consultation should be maintained with the RAPs during the finalisation of the assessment process and throughout the construction phase of the project. Details for how this consultation should be undertaken will be outlined in the ACHMP.	Pre-construction
Consultation	ACH06	A copy of the ACHA should be lodged with AHIMS and provided to each of the RAPs.	Pre-construction
Information management	ACH07	Where the heritage consultant changes through the project, suitable hand over should occur to minimise loss or mistranslation of the intent of the information, findings and future steps in heritage management.	Pre-construction

Table C.1 Mitigation measures

Impact/risk	ID	Measure	Timing
Noise and vibration			
Construction noise and vibration	NV01	Regular reinforcement (such as at toolbox talks) of the need to minimise noise and vibration amongst construction personnel.	Construction
Construction noise and vibration	NV02	Use of portable radios, public address systems or other methods of site communication that may unnecessarily impact upon nearby residents will be avoided.	Construction
Construction noise and vibration	NV03	Routes for the delivery of materials and parking of vehicles to minimise noise will be developed.	Construction
Construction noise and vibration	NV04	Where possible, use of equipment that generates impulsive noise will be avoided.	Construction
Construction noise and vibration	NV05	Nearby residents will be notified prior to the commencement of intensive works.	Construction
Plant and equipment noise and vibration	NV06	Where possible, quieter plant and equipment based on the optimal power and size to most efficiently perform the required tasks will be selected.	Design and construction
Plant and equipment noise and vibration	NV07	Plant and equipment to be operated in the quietest and most efficient manner.	Design and construction
Plant and equipment noise and vibration	NV08	Plant and equipment will be regularly inspected and maintained to minimise noise and vibration level increases and to ensure that all noise and vibration reduction devices are operating effectively.	Construction and operation
Operational noise and vibration	NV09	To address the residual noise exceedance at R1 negotiations have commenced between the applicant and the landholder for treatment to the dwelling (upgraded glazing and where necessary alternative ventilation) to ensure equivalent internal noise levels are achieved (-10 dB or more) below the relevant external PNTL and will be documented in the form of a negotiated agreement. It is recommended that the treatment to the dwelling contained in the agreement be implemented during the early stages of Phase 1 construction in order to further mitigate construction noise impacts.	Construction and operation

Table C.1 Mitigation measures

Impact/risk	ID	Measure	Timing
Operational noise and vibration	NV10	During the detailed design phase of the project all plant and equipment will be reviewed to ensure noise levels predicted in the NVIA can be achieved through: • selection of plant and equipment • site layout and orientation of equipment • provision of acoustic barrier (wall/retaining wall and batter or earth mounds) four metres in height to the north, east, south and west with site access provision provided in north-west corner • utilisation and operational procedures consistent with the assumptions in this NVIA • consideration of additional earth mound to the north-east three metres in height adjacent the Twelve Mile Road site boundary • a combination of the above measures.	Design
Operational noise and vibration	NV11	An EMP will be prepared to manage environmental impacts during the operational phase of the project. For operations, the EMP will address noise management and mitigation options (where required) prior to commencement of operations. The EMP will outline a procedure to: • Measure operational noise levels at early stages during commissioning or within 3 months of operation to validate the predicted operational noise levels. • Re-evaluate the predicted operational noise levels at assessment locations, and where required review noise management, mitigation measures and site management to reduce levels where required. This may include (but is not limited to): – equipment noise controls – provision of additional or amended acoustic barriers – at receiver noise treatment – negotiated agreement – measuring operational noise levels at assessment locations, especially during the evening and night-time period, if relevant, and implementing further noise management and mitigation measures where an exceedance of approved noise levels is identified.	Pre-construction

Table C.1 Mitigation measures

Impact/risk	ID	Measure	Timing
Historic heritage			
Unexpected finds	HER01	If unexpected finds of historical nature are discovered during any work, work within 5 m of the find must cease and the following steps taken: • an archaeologist will be contacted to assess the find, where relevant, and determine if it is clearly a relic or has moderate to high potential to be a relic (this may require additional research) • if the find is determined to be a relic, a s146 (of the Heritage Act) is to be forwarded to the Heritage Council who will be consulted on the appropriate management measure • if the find is assessed and is not a relic, work inside the area that was made a no-go area can re-commence.	Construction and operation
Human remains	HER02	In the event that known or suspected human remains (generally in skeletal form) are encountered during the activity, the following procedure will be followed immediately upon discovery: • all work in the immediate vicinity will cease and the find will be immediately reported to the work supervisor who will advise the Environment Manager or other nominated senior staff member • the Environment Manager or other nominated senior staff member will promptly notify the police (as required for all human remains discoveries) • the Environment Manager or other nominated senior staff member will contact Heritage NSW for advice on identification of the human remains • if it is determined that the human remains are Aboriginal ancestral remains, the Local Aboriginal Land Council will be contacted, and consultative arrangements will be made to discuss ongoing care of the remains • if it is determined that the human remains are not Aboriginal ancestral remains, further investigation will be conducted to determine if the remains represent a historical grave or if police involvement is required.	Construction and operation
Hazards and risks			
Offsite safety incidents	HAZ01	The proponent to consult with Fire and Rescue NSW (FRNSW) during detailed design of the facility to ensure that the relevant aspects of fire protection measures have been included. These may include: • type of firefighting or control medium • demand, storage and containment measures for the medium. The above aspects will form an input to the Fire Safety Study which may be required as part of the development consent conditions, for review and approval by FRNSW.	Design

Table C.1 Mitigation measures

Impact/risk	ID	Measure	Timing
Offsite safety incidents	HAZ02	The proponent to review the investigation reports on the Victorian Big Battery Fire (occurred on 31 July 2021) and implement relevant findings for the project. The publicly available investigation reports include: • Energy Safe Victoria: Statement of Technical Findings on fire at the Victorian Big Battery. • Fisher Engineering and Energy Safety Response Group: Report of Technical Findings on Victorian Big Battery Fire.	Design
Land resources			
Impacts to land and soil capability	LR01	As part of the CEMP, soil management measures are recommended to ensure the preservation of soil resources, including: • assessment of topsoil depths to be stripped prior to stripping to minimise the mixing of topsoil and subsoil • attempt to strip and manage different soils types separately • avoid mixing topsoil with subsoil during stripping operations • avoid stripping topsoil following heavy rain periods that leaves the soil structure saturated • avoid compaction of topsoil during stripping and stockpiling operations • amelioration of topsoil and, where necessary, subsoil during stripping operations in accordance with a soil scientists recommendations. Ameliorants should be applied prior to stripping of their respective layers, to maximise mixing of the ameliorants during the stripping process • stockpile topsoil separately from subsoil (if it is necessary to strip subsoil) • where practical and possible, the subsoils and topsoils should be located so that stockpiled material is placed on the same underlying soil unit; protection of stockpiles from erosion using soil stabilising polymers, cover crops or other forms of stabilisation • revegetation of long-term topsoil stockpiles with native plant community types to minimise stockpile water logging, the generation of anaerobic conditions, help maintain topsoil biological viability and to create a seed store • test stockpiled subsoil and topsoil to determine amelioration requirements prior to reinstatement.	Design

Table C.1 Mitigation measures

Impact/risk	ID	Measure	Timing
Erosion and sedimentation	LR02	Drainage and landform design to: • avoid concentration of flow and maintain sheet flow conditions where practicable • avoid excavating drains in dispersive soils and locate roads, hardstands and pads to utilise the natural slope so that water drains away as required • maintain the velocity of flows below 0.3m/s • avoid the use of structures that pond water and can cause tunnel erosion such as check dams and channel banks in concentrated flows and benches on cut and fill batters • use back-push diversion in lieu of channel banks if it is necessary to divert flow • ameliorate dispersive soils particularly in cable trenches and fill embankments where there is a high risk of tunnel erosion • use high efficiency sediment basins (Type B) with flow activated dosing systems to treat turbid runoff to protect downstream receivers.	Design
Land disturbance extent and duration	LR03	As part of the CEMP, land disturbance processes will be developed to ensure unnecessary land disturbance does not occur, including provision for site inspection by the site Environmental Manager or delegate prior to disturbance to identify any necessary environmental, cultural, drainage and erosion and sediment controls are planned and implemented as required.	Design
Land disturbance extent and duration	LR04	Initial earthworks and major land disturbing activities to avoid high rainfall erosivity period (summer storm season) November through to March where practical to minimise erosion. Where major land disturbing works need to occur in high rainfall erosivity periods then a commensurate level of erosion and sediment control will be adopted.	Design
Land disturbance extent and duration	LR05	The timing of stabilisation and rehabilitation works are to consider: • proximity to sensitive receptors • soil erosivity • slope gradient and length • time of year (rainfall risk) • site access.	Design
Water movement through the site	LR06	Clean upslope run-on should be diverted around areas of ground disturbance to minimise the erosion potential and volume of turbid runoff that needs to be treated.	Design
Water movement through the site	LR07	Access tracks should be designed and constructed to avoid the concentration of flow where possible. The roads should have a crowned profile in most instances with a minimum cross fall of 4% to minimise the formation of corrugations, with infall and outfall drainage only where necessary.	Design

Table C.1 Mitigation measures

Impact/risk	ID	Measure	Timing
Water movement through the site	LR08	Track drainage should be turned out using back push diversion banks or trapezoidal mitre drains where possible. Drains will need to be lined (generally rock) where flow velocities exceed the maximum permissible velocity of the soil.	Design
Water movement through the site	LR09	Track surfaces should be stabilised using a soil stabilising polymer emulsion design to minimise erosion, turbid runoff, dust emissions, watering and maintenance.	Design
Water movement through the site	LR10	The waterway crossings should be a low-level concrete causeway with low flow culverts and a stilling pond type energy dissipator to minimise erosion of the watercourse downstream of the crossing.	Design
Water movement through the site	LR11	Early installation of the causeway should be a priority during track construction to allow the safe passage of clean run-on water.	Construction
Water movement through the site	LR12	Rainfall falling onto the roofs of offices and workshop facilities is clean water and should be captured using gutters and stored in tanks for re-use and overflows directed away from active construction areas.	Operation
Water movement through the site	LR13	Turbid water runoff from the substation/BESS, laydown and where practicable, access tracks should be diverted to Type B sediment basins for treatment.	Design
Water movement through the site	LR14	Sediment Basins should be constructed as a priority before any other land disturbances to maximise the capture of sediment and turbid runoff.	Construction
Water movement through the site	LR15	Fuel storages should be self-bunded and other hydrocarbon and chemical storages bunded in accordance with AS1940.	Design
Stabilisation	LR16	Progressive stabilisation and rehabilitation of disturbed areas should be undertaken to minimise erosion and the generation of sediment and turbid runoff. Due to the gentle slope gradients on site and presence of suitable quality topsoil, bonded fibre matrix hydro-mulches (BFM) are considered appropriate for site rehabilitation purposes. For slopes steeper than 1:2 a hydraulically applied growth medium (HGM) is recommended.	Construction
Stabilisation	LR17	Ensure that non-water soluble, mineral based, biologically inoculated fertilisers are used in any revegetation works to not impact on background landowners participating in organic or carbon farming initiatives.	Construction
Sediment retention	LR18	Type B high efficiency sediment basins with flow activated dosing systems are recommended where calculated soil loss exceeds 150 t/ha/y (Substation/BESS and Laydown Area) or control of turbidity is required to protect creek systems.	Design
Sediment retention	LR19	In-stream sediment controls should be avoided where possible by scheduling works in creeks to avoid the summer storm season.	Construction

Table C.1 Mitigation measures

Impact/risk	ID	Measure	Timing
Sediment retention	LR20	As part of the CEMP, water movement processes will be developed to minimise the potential for accidental turbid water discharge during pumping and dewatering activities on site.	Design
Erosion and sedimentation	LR21	Drainage, erosion and sediment control measures at all times until their function is no longer required.	Construction and operation
Erosion and sedimentation	LR22	Inspections of control measures need to be undertaken following rainfall that causes run-off or monthly during dry conditions.	Construction and operation
Erosion and sedimentation	LR23	Inspections should be undertaken by the site Environmental Manager or delegate. That person shall have the following knowledge: • an understanding of site environmental values that could be impacted by site construction and operation • an understanding of the requirements of the Ministers Conditions of Approval and Environmental Protection Licence that are relevant to drainage, erosion and sediment control • a good working knowledge of drainage, erosion and sediment control fundamentals and the project specific application thereof • ability to provide advice and guidance on appropriate measures and procedures to maintain the site at all times in a condition representative of regionally specific best practice, and that is reasonably likely to achieve the required standards • a good working knowledge of the correct installation, operation and maintenance procedures for the full range of drainage, erosion and sediment control measures used on the project.	Construction and operation
Erosion and sedimentation	LR24	Control measures to be maintained to the maximum practicable extent so that control measures: • will best achieve the sites required environmental protection including achieving the water quality criteria specified in the Environmental Protection Licence in the nominated design storm event • are in accordance with the specified operational standard for each drainage, erosion and sediment control measure • prevents or minimises safety risks.	Construction and operation
Erosion and sedimentation	LR25	All water, debris and sediment removed from control measures shall be disposed of in a manner that will not create an erosion or pollution hazard.	Construction and operation
Erosion and sedimentation	LR26	It is recommended that a hierarchical ESC planning system be adopted for construction and operation of the project consisting of an overarching project wide ESCP with Progressive ESCP's for all disturbance areas to ensure that the projects ESCP's are living documents that can and will be modified as site conditions change, or if the adopted control measures fail to achieve the desired treatment standard.	Design

Table C.1 Mitigation measures

Impact/risk	ID	Measure	Timing
Erosion and sedimentation	LR27	The ESCP's are recommended to be prepared and certified by a suitably qualified and experienced Certified Professional in Erosion and Sediment Control.	Design
Erosion and sedimentation	LR28	If a site inspection or environmental monitoring identifies a significant failure of the adopted drainage, erosion and sediment control measures, a critical evaluation of the failure should be undertaken to determine the cause and appropriate modifications made to the control measures on site and ESCP's amended.	Construction and operation
Erosion and sedimentation	LR29	All project personnel including contractors are recommended to have an appropriate level of drainage, erosion and sediment training. Three levels of competency training for personnel are recommended: • Level 1 – basic awareness level training and provided during the site induction. • Level 2 – half day training for foreman, engineers, project managers etc on the legal aspects of drainage, erosion and sediment control, fundaments and site-specific strategies, techniques and requirements. • Level 3 – detailed one day training course where drainage, erosion and sediment control is a regular component of their daily activities and competence is required.	Construction and operation
Social			
Amenity related to traffic noise	SOC01	Implement ongoing community engagement mechanism (i.e. dedicated project phone number and email), which provides the opportunity for stakeholders to raise complaints, grievances, and provide feedback.	Construction and operation
Community related to community investment, social cohesion, and resilience	SOC02	Develop funding and grant opportunities within the local and regional area where need is determined.	Pre-construction and operation
Community related to community investment, social cohesion, and resilience	SOC03	Develop a strategy for the enhanced identification and implementation of shared value opportunities within the local area.	Pre-construction and operation
Community related to community investment, social cohesion, and resilience	SOC04	Utilise a community and stakeholder engagement strategy to facilitate funding decisions that are informed by the local community, including regular meetings with local MP's, Dubbo Regional Council, local community groups, and local community members.	Pre-construction and operation

Table C.1 Mitigation measures

Impact/risk	ID	Measure	Timing
Public safety related to increased traffic on Goolma Road and through Goolma Road and Twelve Mile Road intersection	SOC05	Action the recommendations of the TIA to improve road safety objectives along the Goolma Road.	Pre-construction and construction
Public safety related to increased traffic on Goolma Road and through Goolma Road and Twelve Mile Road intersection	SOC06	Liaise with Dubbo Regional Council and TfNSW to explore the potential and utility of a reduction in the speed limit along Goolma Road as well as for an increase in road maintenance. The proponent should look to implement a corporate policy that restricts its heavy vehicle fleet to travelling a maximum of 80 km/h along Goolma Road.	Pre-construction and construction
Public safety related to increased traffic on Goolma Road and through Goolma Road and Twelve Mile Road intersection	SOC07	Implement driver inductions, including a driver code of conduct, requiring compliance with road safety procedures and prohibiting unsafe driving practices such as tailgating, convoying, and speeding. Explore carpooling and utilisation of a bus service as a way to mitigate public safety impacts and manage driver fatigue.	Pre-construction and construction
Public safety related to increased traffic on Goolma Road and through Goolma Road and Twelve Mile Road intersection	SOC08	Continue community engagement to monitor compliance with road safety measures and encourage local residents to report any instances of unsafe driving of construction vehicles using community engagement grievance mechanisms.	Pre-construction and construction
Public safety related to increased truck movements along school bus route on Goolma Road	SOC09	Implementing a risk prevention strategy to limit heavy vehicle traffic occurring along the school bus route during school commuting times. The school bus route occurs between 7:52 am – 8:47 am and 3:07 pm – 4:18 pm and it is recommended that heavy vehicles are restricted from travelling during these times. As a precaution, the proponent should ensure that there is a reduction in heavy vehicle speed along the school bus route on Goolma Road during school commuting hours.	Pre-construction and construction
Public safety related to increased truck movements along school bus route on Goolma Road	SOC10	Liaison between the proponent, TfNSW, local Council and the bus operator is recommended to establish safe rural bus stops to enable the bus to draw fully off the road in conjunction with school bus zone signage.	Pre-construction and construction

Table C.1 Mitigation measures

Impact/risk	ID	Measure	Timing
Public safety related to increased truck movements along school bus route on Goolma Road	SOC11	Implementation a Driver's Code of Conduct which would manage the proponent's contribution to these safety issues. The Driver's Code of Conduct should include a requirement for all truck drivers to give way to school bus movements.	Pre-construction and construction
Public safety related to increased truck movements along school bus route on Goolma Road	SOC12	The proponent to be involved in consultation with other developments in the area, namely the proponents of Wellington North Solar Farm and Uungula Wind Farm as well as Dubbo Regional Council, Wellington schools and bus service operator to establish community meetings if required to serve as a consistent means of monitoring the safety of school bus route during construction.	Pre-construction and construction
Public safety related to fire hazards	SOC14	Action the recommendations stated in the PHA to mitigate any potential public safety risks stemming from fire hazards.	Pre-construction and construction
Public safety related to fire hazards	SOC15	Consult with Fire and Rescue NSW (FRNSW) during detailed design of the facility to ensure that the relevant aspects of fire protection measures have been included.	Pre-construction and construction
Public safety related to fire hazards	SOC16	Consult with the local Wellington Fire Service and the Rural Fire Service to implement a Fire Management Plan.	Pre-construction and construction
Livelihood related to increased local employment opportunities	SOC17	Seek to appoint a construction contractor(s) who adopts a preferential approach to hiring which prioritises employment of workers with relevant skills residing within the local area, then the regional area, followed by hiring outside of these areas.	Pre-construction and construction
Livelihood related to increased local employment opportunities	SOC18	The proponent and/or its construction contractor(s) to work with local employment, apprenticeship and training agencies to enhance the potential of hiring of local and regional workers thereby minimising the need to hire workers from outside of the local and regional areas.	Pre-construction and construction
Livelihood related to increased local employment opportunities	SOC19	Partnership with local employment and training agencies could create specific benefits for at-risk youth and people struggling to find employment by providing direct employment opportunities.	Pre-construction and construction
Livelihood related to increased local employment opportunities	SOC20	Provision of apprenticeship and training opportunities.	Pre-construction and construction

Table C.1 Mitigation measures

Impact/risk	ID	Measure	Timing
Livelihood related to training and apprenticeship opportunities	SOC21	To maximise potential benefits, it is recommended that the proponent and/or its construction contractor(s) partner with local employment training agencies to provision for apprenticeships and training programs that are tailored to the local community and promote skilled employment pathways for the project.	Pre-construction and construction
Livelihood related to training and apprenticeship opportunities	SOC22	It is recommended that the proponent and/or its construction contractor(s) explore the opportunity to sponsor the licenses required for employment in the construction industry, which would enable youth, particularly in the regional area, to gain meaningful employment as well as increase their employability.	Pre-construction and construction
Livelihood related to training and apprenticeship opportunities	SOC23	Apprenticeship and employment opportunities can be further enhanced through the implementation of vocational education and training (VET) programs and work experience for schools in the local and regional area. This could encourage pathways to local employment, thereby encouraging youth retention.	Pre-construction and construction
Traffic and transport			
Traffic safety	T01	A BAL will be installed for left turning traffic from Twelve Mile Road westbound to site access road and a CHR(S) will be required for right turning traffic from Twelve Mile Road southbound to site access road.	Pre-construction
Traffic safety	T02	A detailed construction traffic management plan (CTMP) will be developed by the construction contractor in consultation with Dubbo Regional Council prior to the commencement of works.	Pre-construction
Traffic safety	T03	Obtain a permit (from NHVR) to allow OSOM vehicles to use the road network as part of construction.	Pre-construction
Traffic safety	T04	Consider removal of tree hence allowing visibility to a greater distance. Construction stage traffic management measures such as warning signs for trucks entering (sign no. t2-25, to be confirmed in the CTMP).	Pre-construction
Visual			
Visual impacts	VIS01	Development of the project design has included and will continue to include general measures to reduce the degree of contrast between project infrastructure and the surrounding rural landscape, having regard to the form, scale, height, colour and texture of materials incorporated as part of the project.	Design
Visual impacts	VIS02	Where possible, suitable colours and finishes will be chosen for project infrastructure to minimise visual impacts (including glare/reflectivity), including the O&M buildings/facilities and the acoustic wall surrounding the BESS area. These buildings and materials will be designed to blend in with the local rural/farming landscape. If practicable, the wall may be painted in a neutral colour (e.g. khaki, beige, green or similar) rather than white, so as to better blend in with the local rural landscape.	Design

Table C.1 Mitigation measures

Impact/risk	ID	Measure	Timing
Visual impacts	VIS03	Landscaping to be installed along all boundaries of the BESS compound in accordance with the conceptual landscape plan, including use of suitable vegetation species identified in the VIA. The final location and extent of landscaping will be determined during detailed design and following subsequent discussions with the property owners of R23 and local suppliers as part of preparation of the environmental management plan (EMP).	Design
Surface water			
Impacts to watercourses and riparian corridors	SW01	Final project layout to be adjusted, where possible, during detailed design to avoid encroachment into the inner 50% of the vegetated riparian zone along Watercourse A. This should apply to permanent works as well as any temporary works required during construction.	Design
Impacts to watercourses and riparian corridors	SW02	Detailed design to develop a bed level or culvert waterway crossing design for Watercourse A that is consistent with guidance in DoPI (2012).	Design
Impacts to water quality	SW03	Implementation of erosion and sediment control measures and site rehabilitation and revegetation in accordance with best practice. The LSEA (EMM 2020) describes a range of proposed measures for adoption. Proposed measures will be considered further and formalised as part of detailed design and documented in the CEMP. Access tracks to incorporate appropriate water quality treatment measures such as vegetated swales to minimise the opportunity of dirty water leaving the site and entering waterways. Implementation of procedures for hazardous material storage and spill management to be prepared and documented within the CEMP.	Design and pre-construction
Flood impacts	SW04	Construction site planning at detailed design stage to: • consider flood risk and locate temporary site works, compounds, storage areas and plant/equipment away from flood prone areas where practicable • ensure connectivity of temporary drainage to Watercourse A and retention of overland flow paths from the site • maintain riparian corridor setbacks along watercourses.	Design and pre-construction
Water security	SW05	A water supply work approval is to be obtained to convert the existing landholder bore to a water supply bore and a WAL is to be obtained for the required construction water take, should onsite groundwater sources be utilised to supplement other water sources.	Pre-construction
Impacts to watercourses and riparian corridors	SW06	Monitoring of watercourse and riparian corridor condition for Watercourse A immediately adjacent to the project will be undertaken at an appropriate frequency, with maintenance undertaken as required to minimise scouring and erosion in particular in the vicinity of the new watercourse crossing.	Construction and operation

Table C.1 Mitigation measures

Impact/risk	ID	Measure	Timing
Impacts to water quality	SW07	Continuation of erosion and sediment control and site rehabilitation and revegetation measures as appropriate, and monitoring and maintenance of ground cover vegetation and other stabilised surfaces throughout operation to limit erosion and transport of sediment to watercourses. The LSEA (EMM 2020) describes a range of proposed measures for adoption. Proposed measures will be considered further and formalised as part of detailed design and documented in the OEMP. Implementation of procedures for hazardous material storage and spill management to be prepared and documented within the OEMP.	Construction and operation
Flood impacts	SW08	Detailed design of project to minimise potential for offsite flooding impacts up to and including 1% AEP event by: • ensuring finished ground levels are constructed at-grade and not materially higher than existing levels, in particular along potential hydraulic controls that could be formed by the proposed internal access roads • maintaining connectivity of internal stormwater drainage to Watercourse A and retention of overland flow paths from the site • incorporation of a detention function for the site water management basin, to maintain predeveloped storm flows to existing conditions up to the 1% AEP event • maintaining riparian corridor setbacks along watercourses. Flood emergency management protocols and procedures to be developed and documented in a FERP (or equivalent).	Design
Water security	SW09	The WAL obtained for the required construction water take, will also be required to cover nominal water use for potential irrigation of the visual screening during operation.	Pre-operation
Air quality			
Reporting and record keeping	AQ01	Develop appropriate communications to notify the potentially impacted residences of the project (duration, types of works, etc), relevant contact details for environmental complaints reporting.	Pre-construction
Reporting and record keeping	AQ02	A complaints logbook will be maintained throughout the construction phase which should include any complaints related to dust; where a dust complaint is received, the response actions should be detailed in the logbook.	Construction
Reporting and record keeping	AQ03	Record any exceptional incidents that cause dust and/or air emissions, either on or off site, and the action taken to resolve the situation in the logbook.	Construction
Reporting and record keeping	AQ04	Carry out regular site inspections, record inspection results, and make the logbook available for review as requested.	Construction
Dust	AQ05	Erect shade cloth barriers to site fences around potentially dusty activities such as trench excavations and material stockpiles where practicable.	Construction

Table C.1 Mitigation measures

Impact/risk	ID	Measure	Timing
Dust	AQ06	Keep site fencing and barriers clean using wet methods.	Construction
Dust	AQ07	Deploy water carts to ensure that exposed areas and topsoils/subsoil are kept moist.	Construction
Dust	AQ08	Provide an adequate water supply on the construction site for effective dust/particulate matter suppression/mitigation.	Construction
Dust	AQ09	Modify working practices by limiting activity during periods of adverse weather (hot, dry and windy conditions) and when dust is seen leaving the site.	Construction
Dust	AQ10	Minimise drop heights from loading or handling equipment.	Construction
Site inspections – dust monitoring	AQ11	Undertaking daily on-site and off-site inspections, where receptors are nearby, to monitor dust. The inspection results should be recorded in a specific log. Inspection should include regular dust soiling checks of surfaces such as street furniture and cars.	Construction
Site inspections – dust monitoring	AQ12	At the commencement of each day's activities, the local meteorological forecast should be reviewed, including the timing of notable increases in wind speed and/or temperature. Appropriate increased intensity or additional mitigation measures should be planned for the day based on this forecast review. The likely meteorological conditions and implications for dust emissions and impacts should be discussed at the morning toolbox meeting.	Construction
Site inspections – dust monitoring	AQ13	Increasing the frequency of site inspections when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. Should notable visual dust emissions be observed leaving the site boundary, increased intensity or additional mitigation measures should be deployed.	Construction
Site inspections – dust monitoring	AQ14	Undertaking daily on-site and off-site inspections, where receptors are nearby, to monitor dust. The inspection results should be recorded in a specific log. Inspection should include regular dust soiling checks of surfaces such as street furniture and cars.	Construction
Site inspections – dust monitoring	AQ15	At the commencement of each day's activities, the local meteorological forecast should be reviewed, including the timing of notable increases in wind speed and/or temperature. Appropriate increased intensity or additional mitigation measures should be planned for the day based on this forecast review. The likely meteorological conditions and implications for dust emissions and impacts should be discussed at the morning toolbox meeting.	Construction
Site inspections – dust monitoring	AQ16	Increasing the frequency of site inspections when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. Should notable visual dust emissions be observed leaving the site boundary, increased intensity or additional mitigation measures should be deployed.	Construction

Table C.1 Mitigation measures

Impact/risk	ID	Measure	Timing
Speed limit	AQ17	Impose a maximum-speed-limit of 20 km/h on all internal roads and work areas during construction.	Construction
Vehicle fuel combustion emissions	AQ18	Ensure proper maintenance and tuning of all equipment engines.	Construction
Clearing	AQ19	Limit the extent of clearing of vegetation and topsoil to the designated footprint required for construction and appropriate staging of any clearing.	Construction
Exposed soils	AQ20	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.	Construction
Materials handling	AQ21	Minimise drop heights from loading or handling equipment.	Construction
Track out from vehicles	AQ22	Access gates to be located at least 10 m from receptors where possible.	Construction
Track out from vehicles	AQ23	Use water-assisted dust sweeper(s), to remove, as necessary, any material tracked out of the site onto public roads.	Construction
Track out from vehicles	AQ24	Avoid dry sweeping of large areas.	Construction
Track out from vehicles	AQ25	Ensure vehicle loads entering and leaving sites are covered to prevent escape of materials during transport.	Construction
Track out from vehicles	AQ26	Trips and trip distances should be controlled and reduced where possible, for example by coordinating delivery and removal of materials to avoid unnecessary trips.	Construction
Contamination			
Contamination	CON01	An unexpected finds protocol will be developed and contained within the CEMP to include procedures to identify potentially contaminated land, such as: • the observation of discolouration or staining of soils • visible signs of plant stress, presence of drums or other waste material • stockpiles or fill material, or odours. Where signs of contamination are identified, whether from known or unexpected sources, construction work within the affected areas would cease until a contamination assessment was undertaken to advise the need for further investigation or remediation.	Construction
Handling and storing waste	CON02	Procedures for handling and storing waste be developed and implemented and contained within the CEMP, including detail on the handling of potentially or known contaminated material and protocols for waste classification and disposal.	Duration of project

Table C.1 Mitigation measures

Impact/risk	ID	Measure	Timing
Waste			
Waste classification	W01	All waste will be assessed, classified, managed, and disposed of in accordance with the Waste Classification Guidelines (NSW EPA 2014).	Construction
Reporting and record keeping	W02	a construction waste and resource management plan will be developed and contained within the CEMP to outline appropriate management procedures and include, but not be limited to: • identify waste types and volumes that are likely to be generated by the project • adherence to the waste minimisation hierarchy principles of avoid/reduce/reuse/recycle/dispose • waste management procedures to manage the handling and disposal of waste, including unsuitable material or unexpected waste volumes • identification of reporting requirements and procedures for tracking of waste types and quantities.	Pre-construction

Appendix D
Supporting information

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D.1 Addendum traffic impact assessment

Wellington South Battery Energy Storage System

Addendum Traffic Impact Assessment

Prepared for AMPYR Energy Pty Ltd

July 2023

Wellington South Battery Energy Storage System

Addendum Traffic Impact Assessment

AMPYR Energy Pty Ltd

J210534 RP8

July 2023

Version	Date	Prepared by	Approved by	Comments
v1	28 June 2023	Abdullah Uddin	Dr Tim Brooker	Draft
V2	14 July 2023	Abdullah Uddin	Claire Burnes	Final

Approved by

Claire Burnes
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14 July 2023

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1 Introduction

This Addendum Traffic Impact Assessment (ATIA) outlines traffic impacts and its associated mitigation measures for the proposed Wellington Battery Energy Storage System (the project). The original Traffic Impact Assessment [1](TIA) prepared by EMM in support of the Environmental Impact Statement (EIS) for the project can be found on the NSW Major Project website, located here[2].

The original TIA proposed a site access via Goolma Road, which is a Transport for NSW (TfNSW) controlled arterial road (refer to Appendix B of the original TIA). TfNSW objected to the proposed site access on traffic safety grounds. Subsequently, a number of options were examined, and an alternate site access via Twelve Mile Road was identified as the preferred by the major government stakeholders. The alternate Twelve Mile Road site access assumes that the existing road connections between Goolma Road and Twelve Mile Road will be replaced by a new connection to be located further north-east as required by the development consent for the Uungula wind farm construction stage access.

The site is located within the Dubbo Regional Council (DRC) local government area (LGA) at 6773 Goolma Road, Wuuluman. It will be located directly adjacent to the TransGrid owned Wellington Substation and is approximately 2.2 km north-east of the township of Wellington and 44 km south-east of the township of Dubbo.

The regional setting is presented in Figure 1.1 and the site and its surrounding local context is shown in Figure 1.2.

For simplicity, information has been extracted from the original TIA so that this addendum traffic impact assessment can be read as a standalone report, without cross referencing with the original TIA.

1.1 Background

AMPYR Australia Pty Ltd (AMPYR) and Shell Energy (Shell) propose to develop the Wellington Battery Energy Storage System (the project). The project involves the development of a large-scale battery energy storage system (BESS) with a discharge capacity of 500 megawatts (MW) and a storage capacity of 1,000 megawatt hours (MWh). The project also incorporates an on-site substation and connection infrastructure to facilitate transfer of energy to and from the electrical grid, and ancillary infrastructure.

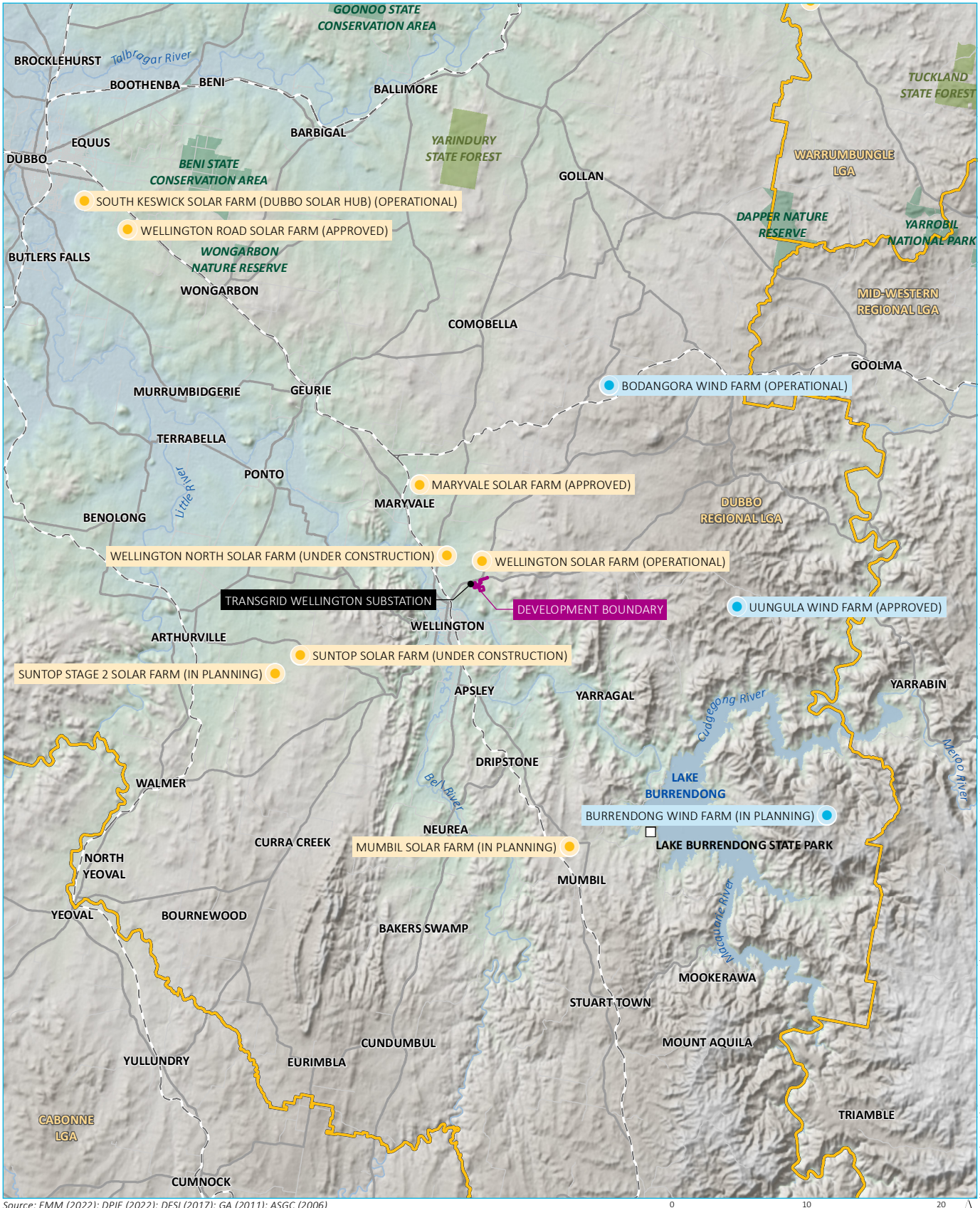
The project will be developed within privately owned land (Lot 32 DP 622471) and will incorporate either an overhead or underground transmission line and upgrade works to Wellington Substation in the adjoining TransGrid owned landholding (Lot 1 DP 1226751). Physical infrastructure associated with the BESS will occupy an area of approximately 13 ha, however during construction, the project will require a disturbance area of up to approximately 22 ha, which includes the area of the existing Wellington Substation site.

The site is located within the New South Wales (NSW) Government declared Central-West Orana Renewable Energy Zone and will complement nearby existing and proposed renewable energy generation assets in the region by smoothing out fluctuations in electricity supply from these new intermittent power sources, providing system security and other network services. In operation, the project will be one of the largest battery storage projects in NSW and will contribute to the overall storage capacity and reliability of the National Electricity Market.

This addendum TIA considers construction and operational traffic associated with the project. Construction traffic generation associated with other projects in the vicinity of the project with potential for overlapping or concurrent construction periods have also been considered as part of a cumulative construction traffic impact assessment.

[1] Report dated 18 October 2022 (version 4)

[2] //efaidnbmnnnibpcajpcglclefindmkaj/https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-27014706%2120221027T214730.891%20GMT



Source: EMM (2022); DPIE (2022); DFSI (2017); GA (2011); ASGC (2006)

0 10 20 km

GDA 1994 MGA Zone 55

N

KEY

- Development boundary
- Lake Burrendong State Park
- Rail line
- Major road
- Minor road
- River
- Named waterbody
- Local government area
- NPWS reserve
- State forest

Renewable energy project

- Solar farm
- Wind farm

Regional setting

Wellington Battery Energy Storage System
Addendum traffic impact assessment
Figure 1.1

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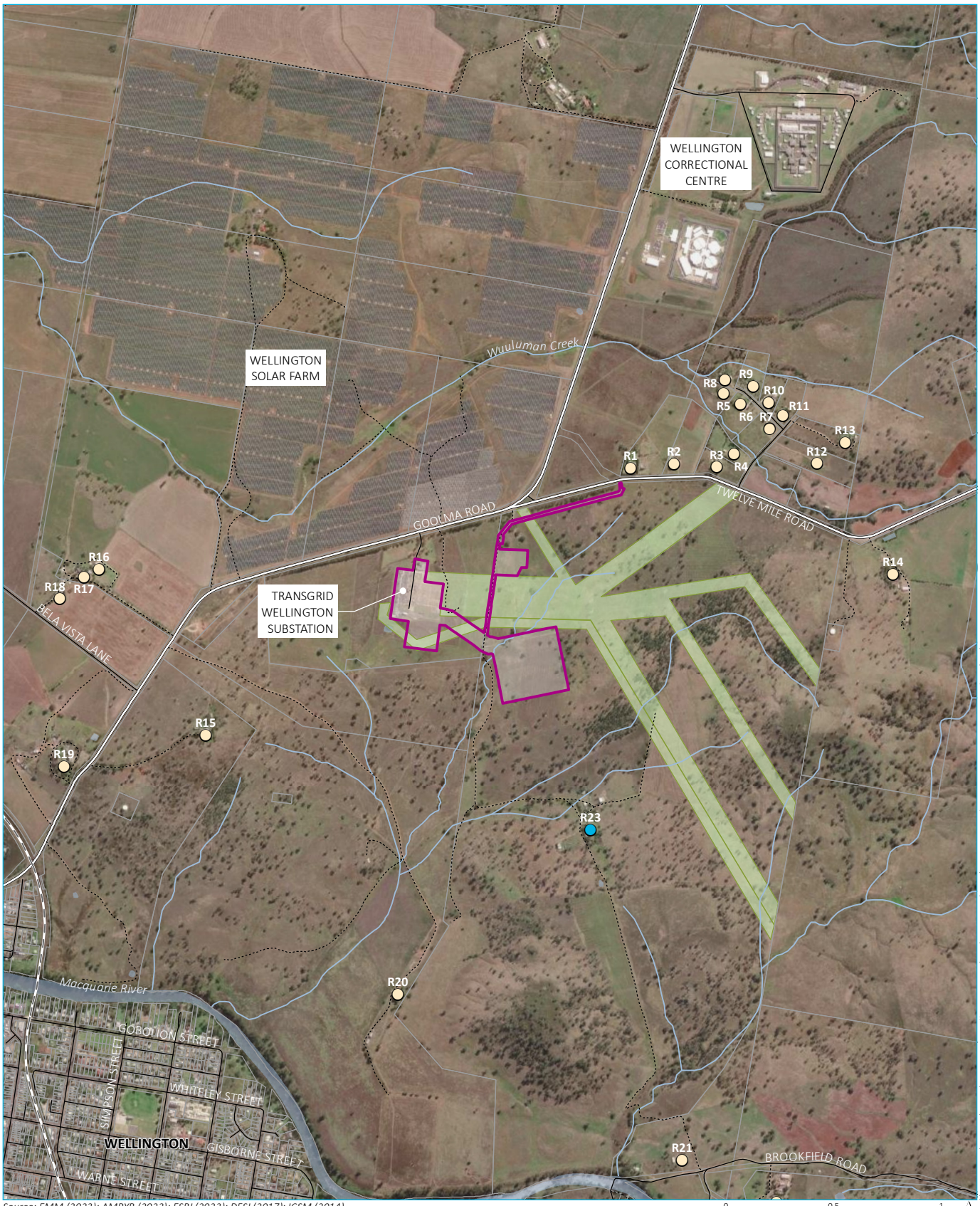

Source: EMM (2023); AMPYR (2023); ESRI (2023); DFSI (2017); ICSM (2014)

0 0.5 1 km

GDA 1994 MGA Zone 55

N

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KEY

- Development boundary
- Rail line
- Major road
- Minor road
- Vehicular track
- Watercourse/drainage line
- Waterbody
- Cadastral boundary
- Freehold easement

Receivers

- Non-project residential receivers
- Project participating landowner

Local context

Wellington Battery Energy Storage System
Addendum traffic impact assessment
Figure 1.2

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1.2 Consultation with the stakeholders

Following exhibition of the EIS, consultation was undertaken with the Department of Planning and Environment (DPE), TfNSW and DRC regarding identified traffic safety issues in the TfNSW submission and consideration of alternate site access options, including the following:

- **Modified site access via Goolma Road** – the original concept design was modified to include longer right and left turn bays and an acceleration lane for the exiting traffic travelling westbound. TfNSW objected to this option and it has therefore not pursued.

- **Site access via Goolma Road using the existing TransGrid access** – this access was identified as a potential option for construction traffic, however limitations that prevented its use for operational traffic also eliminated it as a viable access option for all phases of the project.

- **Site access via Twelve Mile Road** – alternate access from the east of the site via the DRC controlled Twelve Mile Road was identified as a potential option, which has been supported by DPE and DRC (DRC have provided their written consent included as Appendix A). This option relies on the prior construction of the Goolma Road/Twelve Mile Road intersection realignment/upgrade works committed as part of the development consent prior to construction of Uungula Wind Farm as outlined below.

In addition to issues regarding the proposed site access, TfNSW at its letter dated 13 December 2023 sought an explanation of the traffic generation of the proposed development. EMM letter dated 9 February 2023 responded to this matter by undertaking a comparison of traffic generation of various renewable projects. No further questions have been raised from TfNSW and no amendments were made to the impact assessment as a result.

Furthermore, TfNSW also requested to undertake the sight distance assessment based posted speed limit, not the advisory speed limit. The concept plan for the Twelve Mile Road site access intersection has been prepared based on 300 m Safe Intersection Sight Distance (SISD) and a design speed of 110 km/h on the realigned Goolma Road/Twelve Mile Road for the 2.5 second drivers' reaction time.

1.3 Future road improvements

As part of the conditions of consent for the Uungula Wind Farm (SSD 6687), CWP Renewables (now Squadron Energy) is committed to undertake the following road upgrades in support of the use of Goolma Road and Twelve Mile Road for the transport of plant and equipment during construction of that project:

- the closure of the existing intersection at Goolma Road and Twelve Mile Road

- the construction of a new intersection 400 m to the north, and realignment of Twelve Mile Road to connect to the new intersection

- upgrades to Twelve Mile Road along the transport route.

The indicative design for the intersection upgrade is reproduced in Figure 1.3 and Figure 1.4. At the time of this study, the detailed design was being considered by DRC and TfNSW. It is understood that the extant section of Twelve Mile Road will ultimately be closed.

It is important to note that traffic related to this project would use the realigned Goolma Road/Twelve Mile Road intersection, meaning that the proposed site access would not be available until the new intersection is constructed.

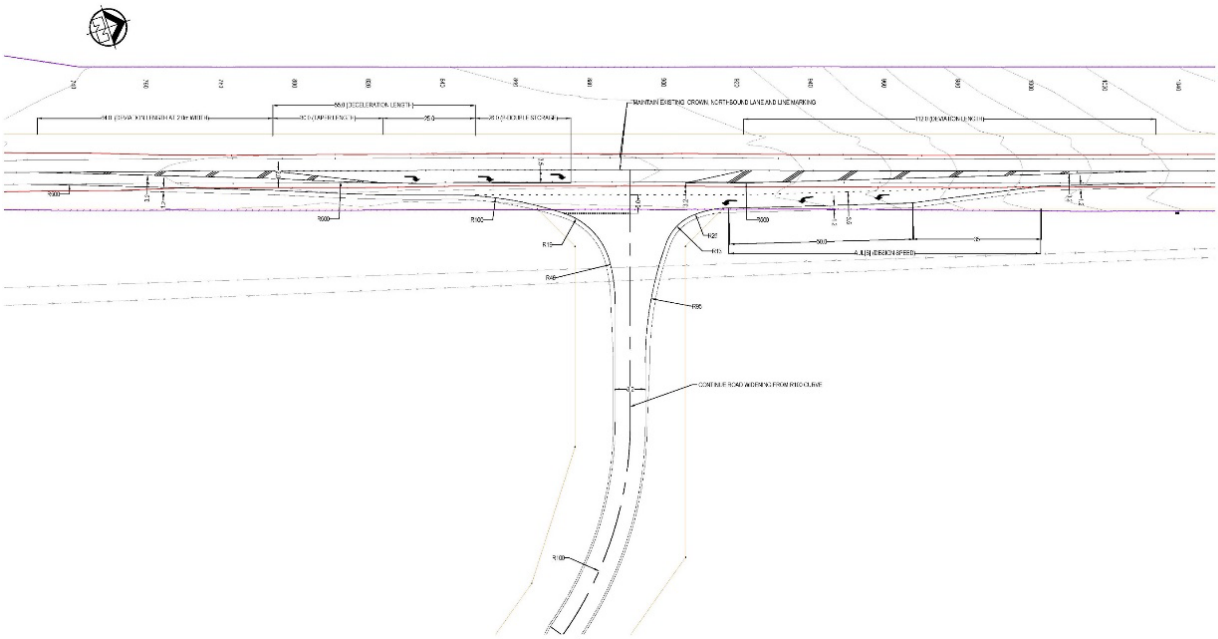
The access road from Twelve Mile Road to the Uungula Wind Farm site will be improved to facilitate the access and egress of larger trucks during construction of that project. Improvements would include gravel coverage, widening to 8 m and additional drainage, as required. The road will be maintained by Squadron Energy during operation to allow for the access and egress of maintenance and operational vehicles.

It is understood that design and planning for Uungula Wind Farm and its associated road works have been ongoing since 2021, and current information at the time of writing indicate that road upgrade construction works will commence prior to the end of 2023, and are anticipated to take approximately 5–6 months to complete.

It is noted that the relocated intersection further north will improve the site access and traffic safety for proposed construction and operations access for this project.

Source: DPIE - SSD 6687 Development Consent

Figure 1.3 Proposed location of Goolma Road/Twelve Mile Road intersection



Source: DPIE - SSD 6687 Development Consent

Figure 1.4 CWP proposed intersection design for new Goolma Road/Twelve Mile Road intersection

2 Project overview

2.1.1 Construction program

Construction is expected to commence in mid 2024 (subject to approval). The project will be constructed and commissioned in line with battery supply availability, labour and equipment availability and increasing demand in the network. This may occur in a single stage over a period of 12–18 months. Alternatively, it is considered likely that it may occur over two stages as follows:

- Stage 1 – commencement of construction mid 2024 and operations mid 2025
- Stage 2 – commencement of construction late 2025 and operation late 2026.

Construction of the project, or each stage of it, would be undertaken in four phases, as follows:

- enabling works (e.g. site establishment) – approximately 2–4 months
- construction works (civil works, structural works, and electrical works) – approximately 5–8 months
- commissioning – approximately 4–5 months
- demobilisation – approximately 1 month.

For the staged construction scenario, Stage 1 would likely include 300 MW installed discharge capacity, all civil and enabling works, installation of batteries, one transformer and switchgear and associated structural, mechanical and electrical works, and connection to the substation. Stage 2 would consist of an additional 200 MW capacity, including installation of a second transformer and associated switchgear and batteries.

Both the single and staged construction scenarios have been considered in undertaking this assessment for the project, which identified the worst case construction traffic scenario as the single stage option. Section 3.2.1 outlines the construction traffic generation associated with that scenario.

2.1.2 Construction hours

Construction hours for the project will be consistent with the *Interim Construction Noise Guideline* (DECC 2009) recommended standard construction hours for normal construction and the and *Draft Construction Noise Guideline* (EPA 2021) being, namely:

- Monday to Friday: 7:00 am to 6:00 pm
- Saturday: 8:00 am to 1:00 pm
- no works of Sunday and public holidays.

Certain activities may be required outside of the standard construction hours. These activities potentially include:

- delivery of plant and equipment for safety reasons (e.g. oversize overmass vehicles)
- commissioning and testing activities that must align with demands on the grid
- situations where agreement is reached with nearby affected receivers and local council.

2.1.3 Construction workforce

The construction phase of the project is expected to generate up to 100 construction personnel, the majority of whom are expected to be located in the Dubbo/Wellington region. Preference will be made for contractors utilising a regional workforce.

3 Traffic generation and distribution

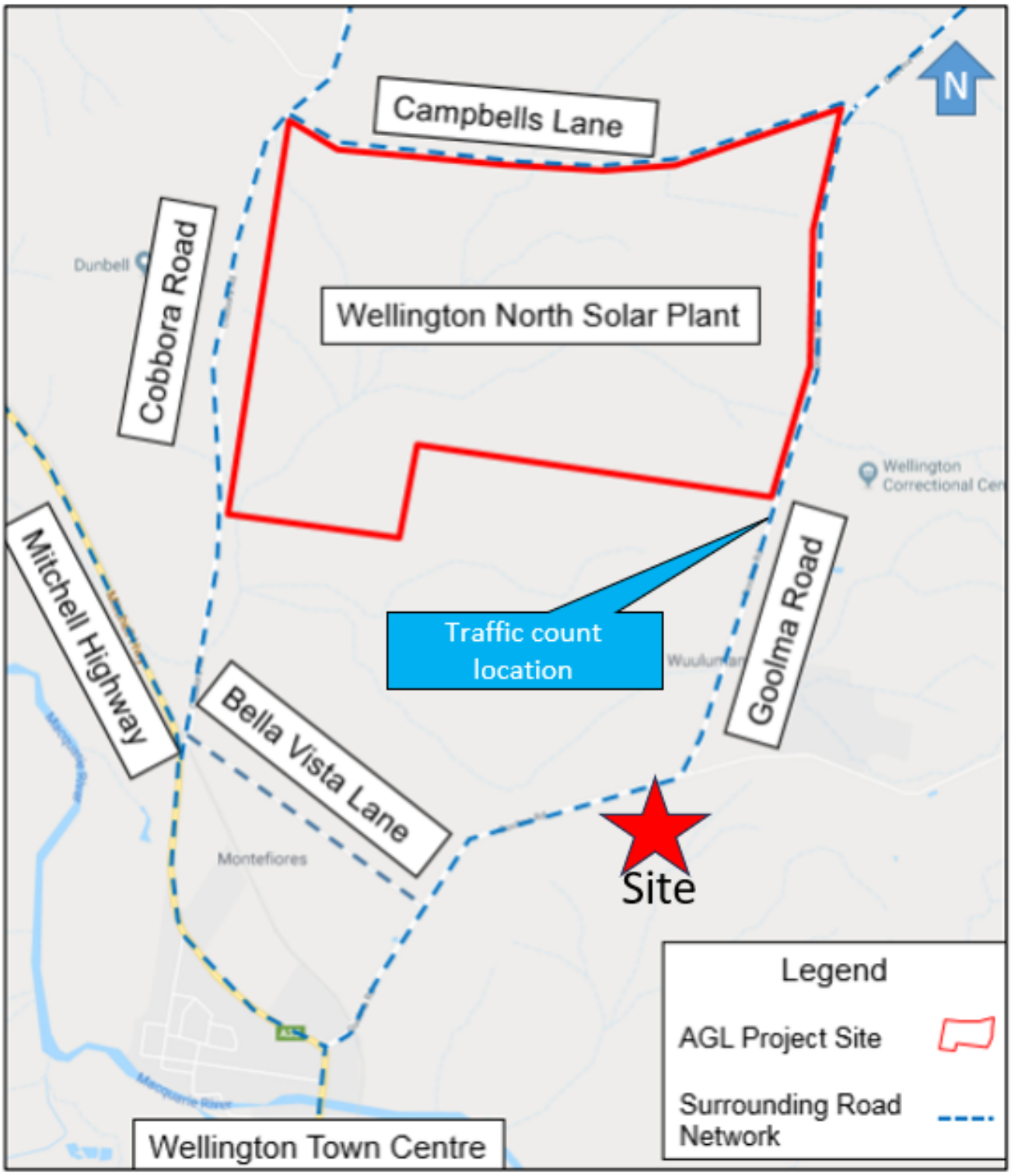
3.1 Existing traffic volumes

Traffic counts near the intersection of Goolma Road and Twelve Mile Road were obtained from Dubbo Regional Council (DRC). Tube counters were placed near the intersection, as shown in red lines in Figure 3.1. The count on Goolma Road was undertaken between the period 13 October to 19 November 2020 and the count on Twelve Mile Road was undertaken between 13 October to 26 November 2020. On Goolma Road, the AM peak hour was from 7:00 am to 8:00 am and PM peak hour was from 3:00 pm to 4:00 pm. On Twelve Mile Road, the AM peak hour was from 8:00 am to 9:00 am and PM peak hour was from 4:00 pm to 5:00 pm.

Figure 3.1 Goolma Road/Twelve Mile Road intersection

Traffic counts for Goolma Road were also obtained from Wellington North Solar Farm (WNSF) Traffic Impact Assessment (GHD, 2021). Tube counters were placed in positions shown in Figure 3.2. The seven-day tube count was conducted on Goolma Road between 28 February and 6 March 2018 (count 3 in Figure 3.2). As per WNSF traffic counts, Goolma Road AM peak hour was from 7:00 am to 8:00 am and PM peak hour was from 4:00 pm to 5:00 pm.

Traffic count data from DRC and GHD (2021) are presented in Table 3.1.



Source: (GHD, 2021)

Figure 3.2 Wellington north solar farm traffic count location on Goolma Road

Table 3.1 DRC Council and GHD traffic volumes

Description		DRC Council traffic volumes		GHD traffic volumes	
		Goolma Road	Twelve Mile Road	Goolma Road	Twelve Mile Road
Survey year		2020	2020	2018	-
Average AM Peak volume	Northbound/ eastbound	170	16	157	-
	Southbound/ westbound			44	-
Average PM Peak volume	Northbound/ eastbound	184	19	66	-
	Southbound/ westbound			135	-
Daily volume		1,939	189	2,140	-
HV %		25%	46%	18%	-

The traffic data in the above table shows that the traffic volumes on Goolma Road were approximately 10% higher in the 2018 GHD count, compared to the 2020 council count, possibly due to Covid-19 impact. The daily traffic on Goolma Road is considered to be over 2,000 vehicles per day. The PM peak volumes were slightly higher than the AM peak for the council counts but AM and PM peak volumes were similar for the GHD count.

On Twelve Mile Road, the daily volumes were less than 200 vehicles. In summary, Twelve Mile Road carried approximately one tenth of traffic to that on Goolma Road.

3.2 Baseline traffic volumes

No intersection count has been undertaken as part of this study as the DRC and GHD traffic data is considered to be sufficient to undertake an accurate traffic impact assessment.

A growth factor of 1% per annum has been applied to the 2018 GHD traffic volumes to estimate the 2023 baseline construction traffic volumes which equates to 5% linear growth for five years. For Twelve Mile Road, the following correction factor is applied to bring the volumes to 2023:

- estimate 2020 WNSF traffic volume for Goolma Road using 1% per annum growth rate
- estimate a correction factor between 2020 DRC and 2018 WNSF Goolma Road traffic volumes
- apply correction factor to 2020 Twelve Mile Road traffic volume
- apply a 1% per annum growth rate to bring the Twelve Mile Road volumes from 2020 to 2023.

The directional split in the AM and PM peak hours on Twelve Mile Road has been assumed to be the same as Goolma Road.

Baseline traffic volumes are presented in Table 3.2.

Table 3.2 2023 baseline traffic volumes

Description		Goolma Road	Twelve Mile Road
Average AM Peak volume	Northbound/eastbound	165	16
	Southbound/westbound	46	4
Average PM Peak volume	Northbound/eastbound	69	7
	Southbound/westbound	142	15
Daily volume		2,247	219
HV %		18%	46%

3.2.1 Construction traffic

The worst case construction traffic scenario is associated with a single stage construction approach for the BESS and Wellington substation upgrade works, as daily and peak hour traffic generation associated with a staged approach would be lower than that generated under the single stage scenario. Estimated construction traffic associated with the single stage construction scenario is as follows:

i Daily traffic generation

The following daily construction vehicle movements are anticipated:

- an average of up to 100 light vehicle trips per day (100 in and 100 out) during the construction works phase
- an average of up to 60 heavy vehicle trips per day (60 in and 60 out) during the construction works phase.

ii Peak hour traffic generation

The following assumptions have been made to anticipate peak hour construction vehicle movements:

- a maximum of 80 light vehicle trips during the morning and evening peak hour (80 in and 80 out)
- a maximum of 30 heavy vehicle trips during the peak hour (30 in and 30 out).

Passenger vehicles are expected to arrive at the site prior commencement of construction shifts. Peak heavy vehicle trips are expected to occur during civil and structural works, associated with the delivery of materials, plant and equipment. Deliveries of batteries and enclosures are anticipated to occur in batches.

Construction traffic movements associated with the project are presented in Table 3.3 and Figure 3.3.

Table 3.3 Construction traffic movements

Description		Goolma Road	
		Light vehicles	Heavy vehicles
AM peak (7:00 am to 8:00 am) movements	Eastbound	48	30
	Westbound	32	30
PM peak (4:00 pm to 5:00 pm) movements	Eastbound	32	30
	Westbound	48	30
Average daily movements		320	

3.3 Operational traffic

The operation of the project is expected to commence from 2025 for a period of approximately 20 years. The project will contribute to the employment of two employees during operation, primarily for scheduled maintenance. There would be up to 4 vehicle trips per day (4 in-bound and 4 out-bound), compromising:

- staff vehicles up to 3 per day (3 inbound and 3 outbound)
- up to one heavy vehicle per day for transporting replacement parts and equipment, as need basis.

The BESS would be operated remotely 24 hours a day, 7 days a week.

Operation of the upgraded Wellington substation will not result in any additional traffic movements at that facility.

Operational traffic volumes will be significantly less than the project's construction traffic. Therefore, this assessment has focused on construction traffic impacts only.

3.4 Over size over mass vehicles

There will be up to 20 Oversize Overmass (OSOM)[3] vehicles during the construction works phase. Relevant permits from the National Heavy Vehicle Regulator will be acquired for the project prior to mobilisation.

OSOM vehicle movements will occur outside of standard construction hours and are anticipated to be wholly via Sydney/Newcastle and are anticipated to travel to site via the Castlereagh Highway and Goolma Road (east) route.

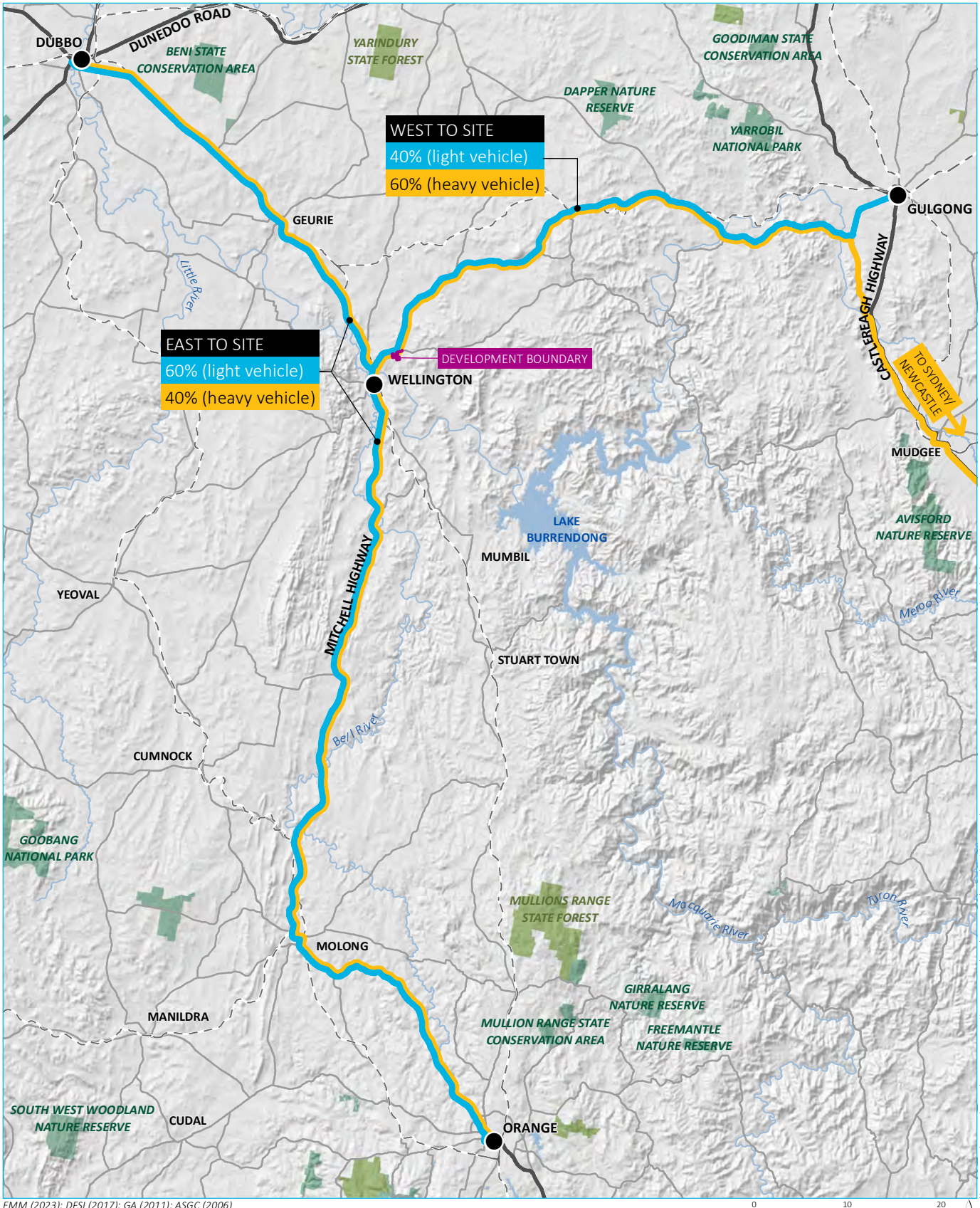
3.5 Traffic distribution

Passenger vehicles are expected to arrive at the site prior to commencement of construction shifts. Construction vehicles are anticipated to be primarily from regional centres including Dubbo/Wellington (60%) and Gulgong (40%) and are anticipated to travel to the site via the Mitchell Highway - Goolma Road (west) – realigned Twelve Mile Road; and Goolma Road (east) – realigned Twelve Mile Road, respectively.

[3] *An oversize or overmass vehicle is a heavy vehicle or combination which alone, or together with its load, exceeds prescribed mass or dimension requirements, and is a heavy vehicle carrying, or designed for the purpose of carrying, a large indivisible item (HVNL s116 (1) (c)). This does not include road trains or B-doubles, or vehicles carrying a freight container designed for multimodal transport. Examples include a prime mover and extendable trailer or a prime mover and low loader combination.*

Heavy vehicle movements, particularly those associated with the delivery of materials and equipment will generally be evenly spread throughout construction hours. Most heavy vehicles are anticipated to be from Sydney or Newcastle and surrounding regional centres (60%). Some heavy vehicles will also originate from Dubbo, Orange, and Parkes (40%). Vehicles travelling from Sydney or Newcastle are anticipated to travel to site via the Castlereagh Highway and Goolma Road (from the east), an approved B-double route. Other vehicles are anticipated to access the site via the Mitchell Highway and Goolma Road (from the west).

Traffic transport routes are presented in Figure 3.3.



EMM (2023); DFSI (2017); GA (2011); ASGC (2006)

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GDA 1994 NSW Lambert

N

KEY

- Development boundary
- Rail line
- Motorway/primary road
- Arterial/subarterial road
- River
- Named waterbody
- NPWS reserve
- State forest

Transport route

- Light vehicle
- Heavy vehicle

Transport routes

Wellington Battery Energy Storage System
Addendum traffic impact assessment
Figure 3.3

EMM creating opportunities

3.6 Nearby development traffic

Development in vicinity of the project has the potential to generate cumulative traffic impacts with the project. The status of surrounding projects has been considered in Chapter 7 of the EIS.

The greatest potential for cumulative impacts of future projects and the project in relation to traffic are associated with the following two projects, which have the potential to have construction periods that overlap with the project:

- Wellington North Solar Farm (SSD 8895)
- Uungula Wind Farm (SSD 6687).

It is noted that Wellington Solar Farm (SSD 8573) is now in its commissioning/operational phase, therefore cumulative impacts associated with that project are not anticipated.

The locations of each of these developments are illustrated in Figure 3.3.

3.6.1 Wellington North Solar Farm

LSbp responded to EMM's request for information regarding its forecast traffic movements for the Wellington North Solar Farm, which is summarised in Table 3.4. The construction of WNSF commenced earlier this year and is expected to continue for a period of 18 months. The WNSF will utilise Goolma Road to access the site and the main vehicular access route is south via the Mitchell Highway and Goolma Road (GHD, 2021).

The GHD report states that there will be two OSOM vehicles during the construction period. Heavy vehicles will include vehicles related to construction activity and shuttle buses transporting staff. The remaining staff will be commuting via light vehicles. All construction traffic is expected to travel to the Goolma Road site access via the Mitchell Highway located to the south.

Based on the above consideration, Wellington North Solar Farm's forecast total and peak hourly traffic distribution is summarised below:

- ***OSOM vehicles*** (2 movements in total): 100% from the south.
- ***Heavy vehicles*** (19 movements): This includes 3 construction heavy vehicles and 16 shuttle buses. 100% from the south.
- ***Light vehicles*** (66 movements): 100% from the south.

It is noted that, dependent on timing, WNSF construction traffic movements may be impacted by the Uungula Wind Farm road realignment works.

The forecast OSOM vehicles movements are low and have not been considered in the cumulative traffic impact assessment. The remaining 85 peak hourly movements would pass through the realigned Goolma Road/Twelve Mile Road intersection once constructed. It is reasonable to assume that during the AM peak all light vehicle movements will occur north eastbound (towards the solar farm construction site) and vice versa during the PM peak.

Table 3.4 Wellington North Solar Farm construction traffic movements

Description		Goolma Road	
		Light vehicles	Heavy vehicles
Average AM peak movements	Eastbound	66	19
	Westbound	0	19
Average PM peak movements	Eastbound	0	19
	Westbound	66	19
Average daily movements		267	

3.6.2 Uungula Wind Farm

EMM approached CWP (now Squadron Energy) with a request for its recent forecast traffic movements for the Uungula Wind Farm (UWF). CWP referred to information contained in the publicly available EIS and supporting Uungula Wind Farm Project Transport Assessment (Samsa Consulting 2020). Construction activity for UWF is likely to occur over approximately 24 to 30 months with peak traffic generation for six months out of the total 24 to 30 month construction period. The forecast construction traffic movements for the wind farm are presented in Table 3.5.

Table 3.5 Uungula Wind Farm construction traffic movements

Description		Goolma Road	
		Light vehicles	Heavy vehicles
Average AM peak movements	Eastbound	100	11
	Westbound	100	10
Average PM peak movements	Eastbound	100	10
	Westbound	100	11
Average daily movements		506	

The report states OSOM vehicles will use the Goolma/Twelve Mile Road intersection to/from the west (e.g. Dubbo). Heavy vehicles and light vehicles (construction workers) will have 50%/50% split via Goolma Road from the east and west, with all vehicles using the new Goolma Road/Twelve Mile Road intersection.

Based on the above consideration, Uungula Wind Farm's traffic distribution is summarised below:

- ***OSOM vehicle*** (4 movements): 100% to from the west (via the new Goolma Road/Twelve Mile Road intersection).
- ***Heavy vehicle*** (21 movements): 50% of the traffic generation e.g. 11 movements will arrive via Goolma Road from the west (e.g. Dubbo) and the remaining 50% (10 vehicles) will arrive via Goolma Road from the east. All vehicles will use the new Goolma Road/Twelve Mile Road intersection
- ***Light vehicle*** (200 movements): 50% of the traffic generation e.g. 100 movements will arrive via Goolma Road from the west (e.g. Dubbo) and the remaining 50% (100 vehicles) will arrive via Goolma Road from the east.

As the OSOM vehicles will be escorted, these trip generation have not been considered in the cumulative traffic impact assessment. The 221 heavy and light vehicle movements would use the realigned Goolma Road/Twelve Mile Road intersection. It is reasonable to assume that during the AM peak all light vehicle movements will occur eastbound (towards the windfarm construction site) and vice versa during the PM peak.

3.7 Cumulative traffic

The cumulative traffic using Goolma Road, which is the summation of baseline traffic volumes (Table 3.2); and construction traffic movements for the project (Table 3.3), Wellington North Solar Farm (Table 3.4) and Uungula Wind Farm (Table 3.5) is presented in Table 3.6.

The location of the nearby developments is illustrated in Figure 3.4.

Table 3.6 Cumulative traffic movements

Description		Goolma Road				
		Baseline	Project Construction	Wellington North	Ungula Wind Farm	Total
AM peak movements	Eastbound	165 (16)	48 (30)	66 (19)	100 (11)	379 (76)
	Westbound	46 (4)	32 (30)	0 (19)	100 (10)	178 (63)
PM peak movements	Eastbound	69 (7)	32 (30)	0 (19)	100 (10)	201 (66)
	Westbound	142 (15)	48 (30)	66 (19)	100 (11)	356 (75)

Note: Values in brackets are heavy vehicle movements and values outside brackets are light vehicle movements.

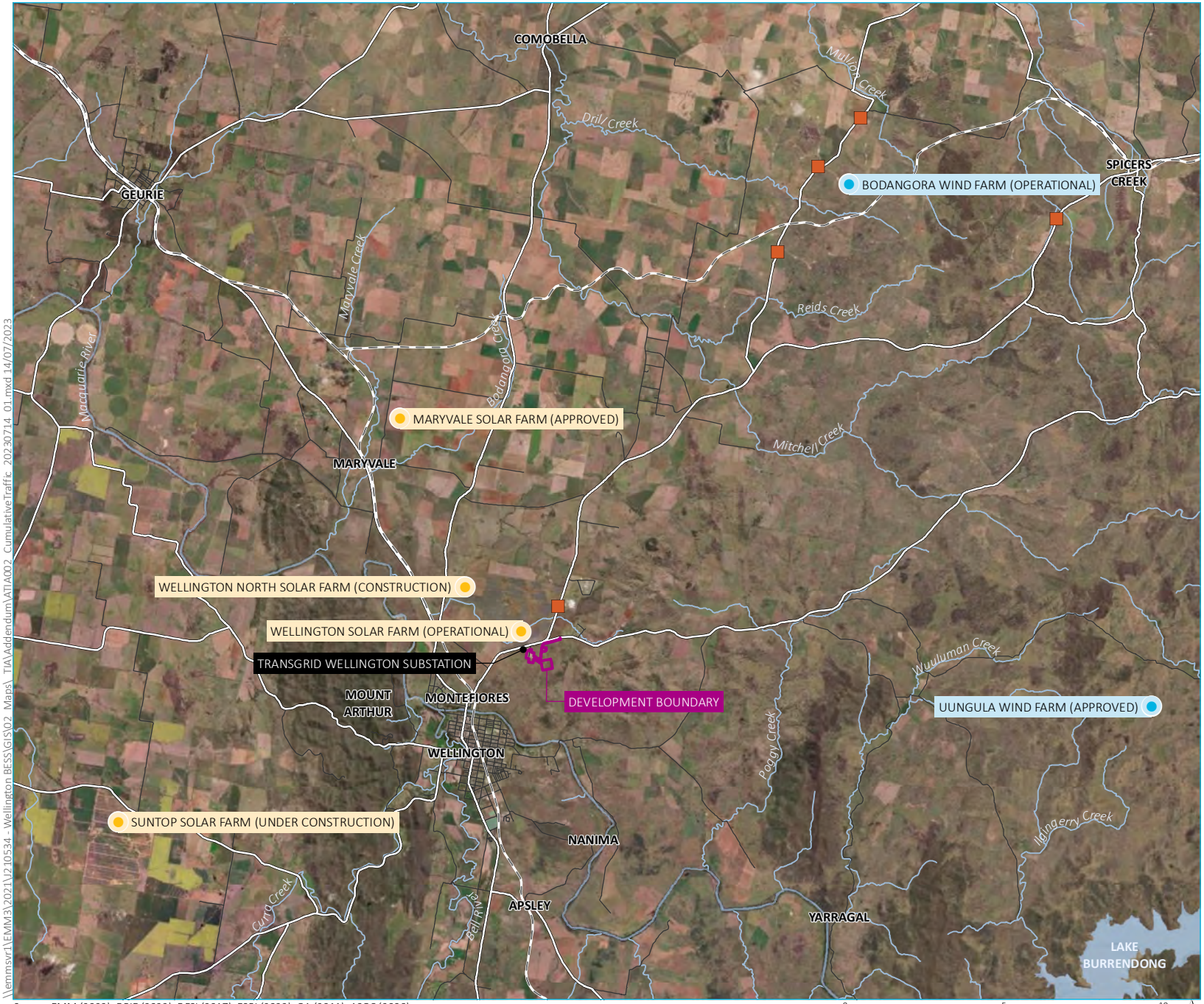
The cumulative traffic movements in this section present a worst-case scenario where peak construction stages of nearby developments are assumed to overlap with the peak construction period of the project. The above table shows that there will be highest eastbound traffic generation during the AM peak and vice versa during the PM peak, should all the projects occur simultaneously.

The traffic and transport assessments for WNSF (GHD, 2021) and UWF (Samsa Consulting, 2020) do not mention the construction start and end months/year of their respective developments. Construction of WNSF commenced in 2023, and current information at the time of writing indicates that construction of Uungula Wind Farm associated road realignment/upgrade works will commence prior to the end of 2023.

3.8 Car parking

During construction, worker vehicles will either park at the temporary laydown area (where a construction compound will be located) or at the BESS compound. No cars will park along Goolma Road or Twelve Mile Road.

A car park will be established in the vicinity of the control and office building for the parking of vehicles during operation. In accordance with Section H2 of the *Wellington Development control plan 2013*, a minimum of three spaces will be provided, one of which will be an accessible parking space. The location of the carpark will be confirmed in the detailed design.



KEY

- Development boundary
- Rail line
- Major road
- Minor road
- Named watercourse
- Named waterbody
- NPWS reserve
- State forest (refer to inset)
- Access point for operational developments

Renewable energy project

- Solar farm
- Wind farm

Source: EMM (2023); DPIE (2022); DFSI (2017); ESRI (2023); GA (2011); ASGC (2006)

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Nearby development and cumulative traffic

Wellington Battery Energy Storage System
Addendum traffic impact assessment
Figure 3.4

EMM creating opportunities

4 Impact assessment

This chapter presents the worst case traffic impact assessment scenario considered for the project in which cumulative traffic generation associated with construction of the Wellington North Solar Farm and Uungula Wind Farm developments (Section 3.6) occurs concurrently with construction of this project. This allows for a conservative assessment to determine the worst possible scenario in terms of traffic impacts due to the projects.

In addition, the worst case construction traffic scenario has been considered for the project, which is represented by a single stage construction scenario (as opposed to a staged construction scenario, whereby daily and peak hourly construction traffic generation would be significantly lower than the single stage construction scenario traffic generation).

4.1 Mid-block capacity analysis

Capacity, as defined in (HCM, 2016), is the maximum sustainable hourly rate at which persons or vehicles can reasonably be expected to traverse a point or uniform section of a lane or roadway during a given time period under the prevailing roadway, environmental, traffic and control conditions. When capacity is estimated at a mid-block section of a lane or roadway, it is referred to as mid-block capacity.

The mid-block Level of Service (LOS) on rural and urban roads is assessed based on a vehicle's average travel speed. At low traffic volumes and under ideal conditions, drivers are able to travel at their desired speed without interference. As traffic volumes increase, and as roadway, terrain and traffic conditions become less than ideal, drivers are affected by the presence of other vehicles on the road and this forms bunches in the traffic stream.

There are six levels of service, as described below in Table 4.1, from *Guide to Traffic Generating Developments* (RTA, 2002).

Table 4.1 Mid-block level of service descriptions

Level of service	Level of service description
Level of Service A	This, the top level is a condition of free flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high, and the general level of comfort and convenience provided is excellent.
Level of Service B	This level is in the zone of stable flow and drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream, although the general level of comfort and convenience is little less than that of the level of Service A.
Level of Service C	This service level is also in the zone of stable flow, but most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience declines noticeably at this level.
Level of Service D	This level is close to the limit of stable flow but is approaching unstable flow. All drivers are severely restricted in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is poor, and small increases in traffic flow will generally cause operational problems.
Level of Service E	This occurs when traffic volumes are at or close to capacity and there is virtually no freedom to select desired speeds or to manoeuvre within the traffic stream. Flow is unstable and minor disturbances within the traffic stream will cause a traffic-jam.
Level of Service F	This service level is in the zone of forced flow. With it, the amount of traffic approaching the point under consideration exceeds that which can pass it. Flow break-down occurs and queuing and delays result.

4.2 Rural road capacity

Table 4.5 of *Guide to Traffic Generating Developments* (RTA, 2002) provides the two-way hourly traffic capacities (e.g. number of vehicles per hour) for two-lane roads for different LOS with a design speed of 100 km/h based on different terrain types. The capacities assume 60% of traffic is travelling in one direction and 40% is travelling in the other direction.

The capacities for each LOS transition (e.g. the combined number of vehicles travelling in both directions at where the LOS decreases) are provided in Table 4.2 for Goolma Road, assessed for rolling terrain.

Table 4.2 Roadway hourly capacity for a two-lane two-way rural road (100 km/h speed limit)

Terrain	Level of service transition	Effect of percentage of heavy vehicles (in traffic flow)						
		0%	5%	10%	15%	20%	25%	30%
Rolling	A/B*	250	210	180	155	135	120	110
	B/C	500	420	360	310	270	240	220
	C/D	920	760	650	570	510	470	450
	D/E	1370	1140	970	700	630	580	550
	E/F	2420	2000	1720	1510	1,360	1,260	1,210

Notes: *Assumed to be 50% of upper limit of B/C LOS.

Columns 20% to 30% have been extrapolated from the preceding columns.

The column for 20% heavy vehicles has been used to determine baseline Goolma Road mid-block capacity LOS in Table 4.3. Cumulative traffic mid-block capacity has been determined from 35% heavy vehicles, extrapolated from previous columns.

4.3 Rural road compliance

As the majority of project traffic will travel from the west via Goolma Road, mid-block capacity analysis has been undertaken at Goolma Road, south of the location of the new Goolma Road/Twelve Mile Road intersection. The mid-block capacity (LOS) assessment for Goolma Road is provided in Table 4.3 for the baseline and cumulative traffic scenarios.

The baseline traffic volumes are extracted from Section 3.2 and the cumulative traffic volumes are extracted from Section 3.7.

Table 4.3 Goolma Road mid-block capacity (including Ungula Wind Farm construction traffic)

Scenario	Peak hour volume	Heavy vehicle percentage	Level of Service
Baseline traffic	211 (AM)/211 (PM)	18% (AM)/18% (PM)	B/B
Cumulative traffic	510 (AM)/510 (PM)	35% (AM)/35% (PM)	D/D

The Goolma Road LOS has been determined from further extrapolations of the values presented in Table 4.2. Goolma Road is expected to operate at LOS B in the baseline traffic scenario and at LOS D in the cumulative traffic scenario.

The reduction in the LOS (by two levels) is only for the duration of the assessment period which corresponds to the period of peak construction activity for all three projects. When the combined project construction work has been completed, the LOS will return to the baseline traffic conditions.

Furthermore, this assessment has been carried out for a worst-case scenario where it is assumed that all traffic from the other nearby developments at Wellington North and Uungula, project construction traffic and baseline road network traffic would all overlap in the same morning and evening peak hours. This is considered highly unlikely, as the arrival and departure patterns of all traffic sources may not necessarily coincide.

The LOS D is considered close to the limit of stable traffic flow but is expected to be experienced during construction period only during the AM and PM peak hours. At other times of the day, the LOS would be better than D.

4.4 Warrants for BA, AU and CH Turn Movements

Intersection operations are also assessed from the combination of the peak hourly through and turning traffic movements that occur at each intersection. This determines the need for additional intersection turning lanes (eg basic, auxiliary lane and channelised) in accordance with the current intersection design standards (Austroads 2017b) *Guide to Road Design Part 4, Intersections and Crossings General* (Figure 4.1), where:

- Curve 1 (red line) represents the boundary between a basic right turn (BAR) and a channelised short right turn (CHR(S)) turn treatment and between a basic left turn (BAL) and an auxiliary short left turn (AUL(S)) turn treatment.
- Curve 2 (blue line) represents the boundary between a CHR(S) and a full length CHR treatment and between an AUL(S) and a full length AUL or CHL treatment. The choice of CHL over an AUL will depend on factors such as the need to change the give way rule in favour of other manoeuvres at the intersection and the need to define more appropriately the driving path by reducing the area of bitumen surfacing.

Figure 4.1 below contains the graphs for the selection of turn treatments on roads with a design speed greater than or equal to 100 km/h which is appropriate for high-speed rural roads.

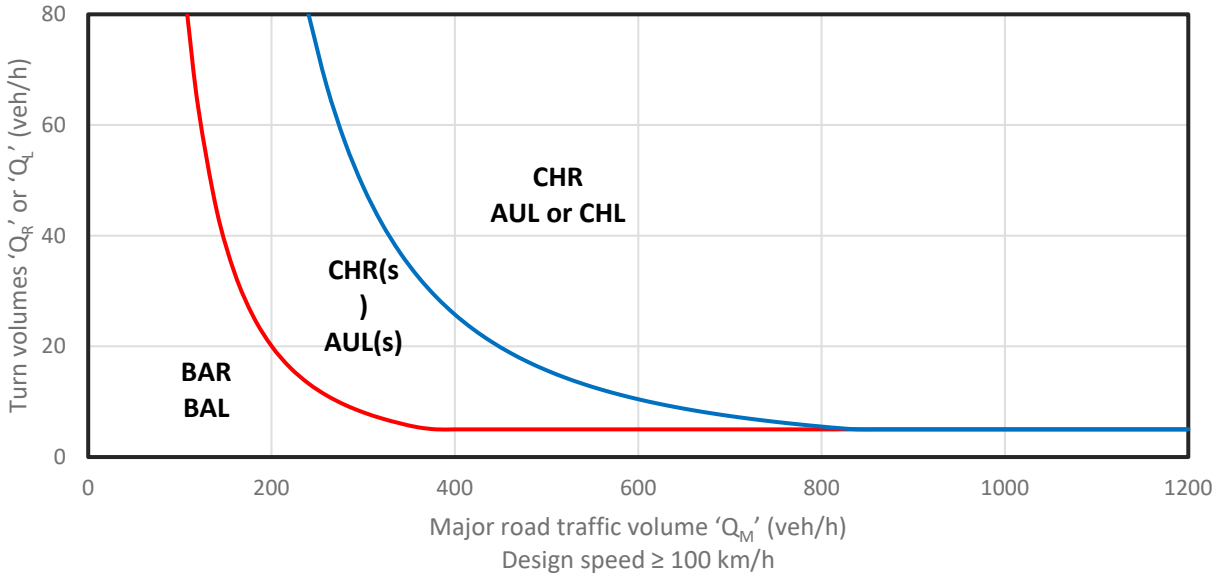


Figure 4.1 Austroads warrant design charts for rural intersection turning lanes

TfNSW recommends that intersections should be designed for a travel speed 10 km/h greater than the posted speed limit. As Twelve Mile Road has a posted speed limit of 100 km/h, the site access intersection (including any requirements for turning bays) should be designed for 110 km/h.

For a design speed of 100 km/h or greater, the requirements for additional left or right turn traffic lanes are measured from Figure 4.3.

In the analysis, it is assumed that the existing site access and the two current connections between Goolma Road and Twelve Mile Road will be closed off (Figure 4.2).

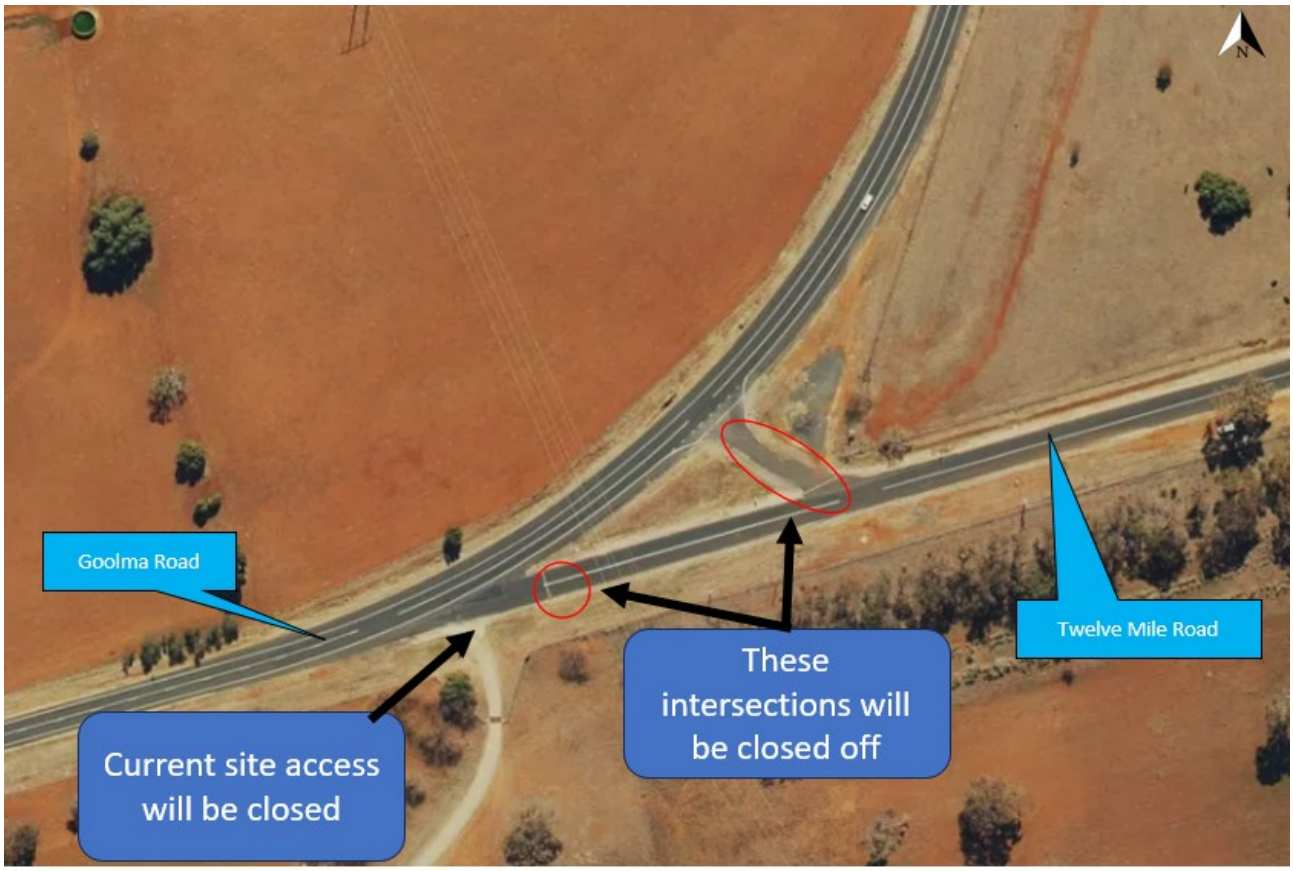


Figure 4.2 Assumptions for the traffic assessment

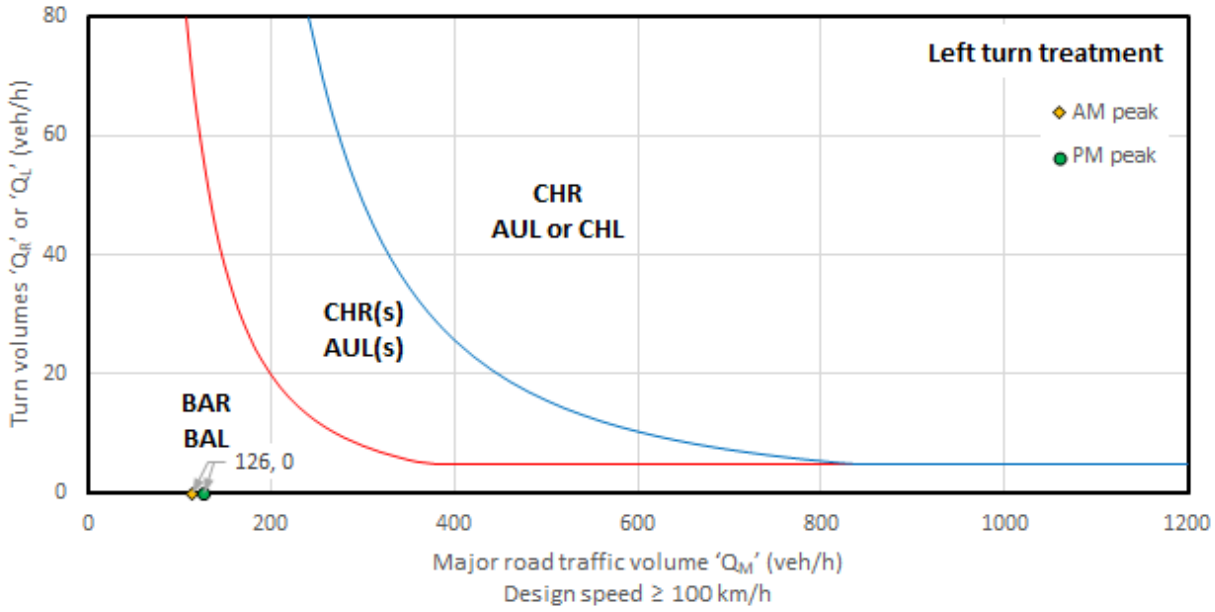
The intersection peak hourly turning traffic volumes for the warrant assessment for the cumulative traffic is summarised in Table 4.4. For the assessment, it is assumed that there is no traffic generation to the existing site. The traffic estimation in the following table is a summation of 2023 existing traffic (Table 3.2), project construction traffic (Table 3.3) and Uungula Wind Farm traffic (Table 3.5). Wellington North Solar Farm traffic is not considered as they are not assumed to travel along Twelve Mile Road. It is assumed that no traffic will travel from the east along Twelve Mile Road and turn left into the site.

Table 4.4 Intersection turn treatment warrant for realigned Twelve Mile Road/Site Access Road intersection (including Ungula Wind Farm construction traffic)

Movement	Peak hour	Major road traffic volume	Turning traffic volume	Turn treatment required
Left turn from major road	AM	4+110 =114	0	BAL
	PM	15+111 =126	0	BAL
Right turn from major road	AM	16+4+110+111 = 241	48+30 = 78	CHR (S)
	PM	7+15+110+111 = 243	32+30 = 62	CHR(S)

Based on the cumulative traffic volumes for the Twelve Mile Road/Site Access Road intersection, the following turn treatments will be required for the project construction traffic access (Figure 4.3):

- a Basic Left Turn (BAL) will be required for left turning traffic from Twelve Mile Road westbound to the site access road
- a channelised short right turn treatment CHR(S) will be required for right turning traffic from Twelve Mile Road southbound to site access road.



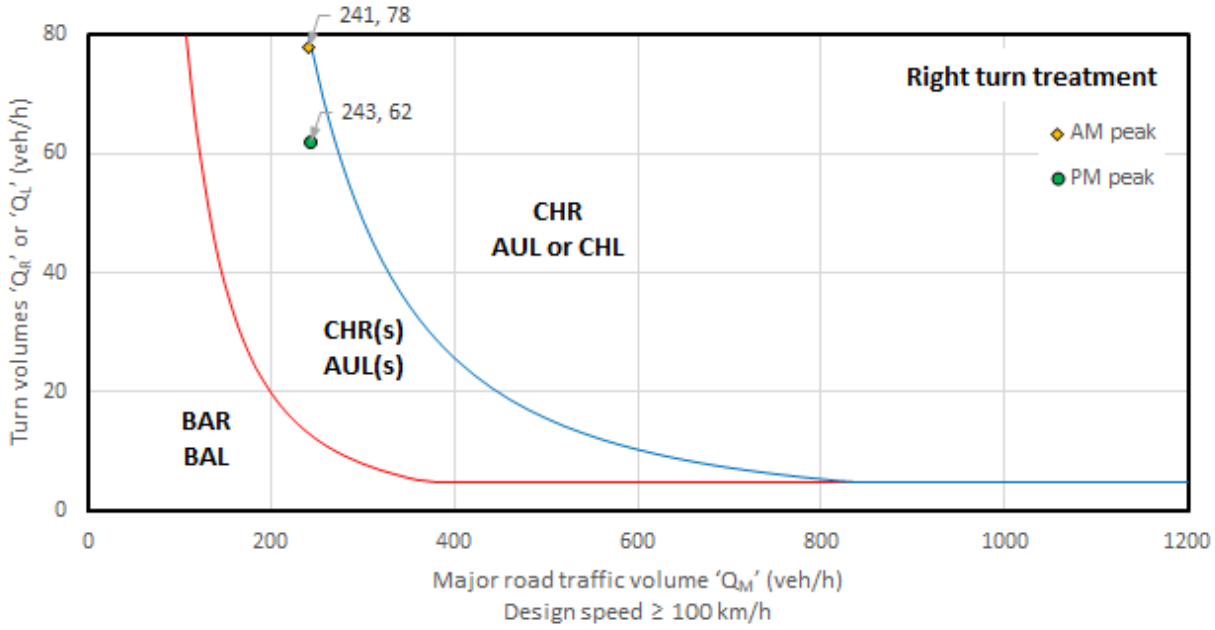


Figure 4.3 **Austroads turn treatment warrant assessment for Twelve Mile Road/Site Access intersection (including Ungula Wind Farm construction traffic)**

Based on the above analysis, a Basic Left Turn Lane (BAL) and a channelised short right turn bay (CHR(S)) will be required on realigned Twelve Mile Road at the site access intersection. The relevant concept design is described in Chapter 5 of this report.

4.5 Operation traffic impact assessment

There will be four daily trips during the operation stage of the development (three light and one heavy vehicles). These volumes are significantly lower than the construction traffic generation and are unlikely to have any noticeable impact to the adjoining road network. Therefore, detailed traffic impact assessment for a 10 year horizon is not required.

4.6 Staged construction impact assessment

As discussed in Section 2.1.1, there is a likelihood of construction of the project occurring in two stages. This may result in Stage 1 operational traffic coinciding with Stage 2 construction traffic for the duration of the Stage 2 construction.

Stage 1 operational traffic would consist of up to two staff vehicles and one heavy vehicle for maintenance activities. Stage 2 construction traffic would be reduced in comparison to Stage 1 construction, as some construction activities such as site establishment works, intersection upgrade works, and parts of construction works (civil works, structural works, and electrical works) would already be completed during Stage 1 construction.

The staged construction works would reduce the peak construction traffic movements in comparison to single stage construction scenario and is not expected to generate significant traffic impacts if coinciding with nearby development traffic.

The overlap of Stage 1 operational and Stage 2 construction traffic is unlikely to result in significant traffic impacts. However, an operational traffic management plan may be required to ensure that operational traffic and construction traffic does not compromise any traffic or pedestrian safety within the project site.

5 Concept plan

As stated in Section 1.2, the concept plan has been prepared in consultation with DPE and DRC, with in-principle support provided by DRC (refer Appendix A). The concept plan is attached in Appendix B. The concept plan shows that a 111 m long right turn bay (including taper) is provided from Twelve Mile Road to the site. The intersection geometry is determined by the swept path assessments by a 26 m B-double truck, which is the longest construction vehicle accessing the site.

As no traffic is coming from the west along Twelve Mile Road, swept path assessment has not been undertaken for left turns into the site, however, the intersection geometry is large enough for light vehicles turning left from Twelve Mile Road, should any construction worker come from the west.

It should be noted that the concept plan for the site access intersection has been prepared based on the single stage project whereby the maximum construction traffic generation will occur at the site. This is a conservative assessment. If the project proceeds in two separate stages, a shorter right turn bay may be suitable subject to further design consideration.

6 Safety assessment

6.1 Road safety assessment at the project site entrance

In accordance with *Austroads Guide to Road Design Part 4A (Unsignalised and Signalised Intersections)* (Austroads, 2017), all unsignalised T-intersections must provide adequate visibility for turning traffic safety. This is assessed in further detail below, in terms of the safe intersection sight distance (SISD) at the intersection, which varies according to the design speed of the road. Normally a design speed 10 km/h higher than the posted speed limit is used to calculate the SISD.

Twelve Mile Road has a speed limit of 100 km/h near the site access intersection. In accordance with *Austroads Guide to Road Design Part 4A (Unsignalised and Signalised Intersections)* (Austroads, 2017), for a road with design speed of 110 km/h, the minimum SISD required for a general minimum 2 second driver reaction time, is 285 m.

The sight distances on Twelve Mile Road at the site access have been estimated based on the line of sight and observation, as shown in Appendix B. The assessment shows that a minimum 300 m sight distance is achieved on both approaches from the proposed site access.

The proposed site access should not be operational until the existing two vehicular connections between Goolma Road and Twelve Mile Road are closed off.

7 Conclusion and summary

This addendum TIA has reviewed and assessed project-related construction daily and peak hour traffic volumes in consideration of the potential for staged or single phase construction, along with cumulative traffic volumes along the road network to determine whether there is sufficient road network capacity and to ensure the road network will be adequate to accommodate the additional traffic movements generated by the project.

Vehicle movements will take place primarily on Goolma Road. Construction of the project will occur in a single stage over a period of 12–18 months, or over two stages each between 12–18 months, commencing in April 2024, subject to approval. The worst case construction traffic scenario is associated with the single stage construction, which at its peak is expected to generate up to 100 construction personnel.

Construction traffic includes passenger vehicles transporting construction workers and heavy vehicles transporting project equipment. There will be an average of up to 100 passenger vehicles and 60 heavy vehicles per day, and a maximum of 80 passenger vehicles and 30 heavy vehicles during the peak hour, in the construction phase. There will be up to 20 OSOM vehicles in total during the construction phase and the relevant travel permits for these vehicles will be acquired from NHVR for the project, prior to mobilisation.

The cumulative impact assessment has considered the potential additional construction traffic associated with the Uungula Wind Farm and Wellington North Solar Farm projects (both constructed concurrently in a single stage). It is assumed that all traffic will use the realigned Goolma Road/Twelve Mile Road intersection for the cumulative scenario and no project related traffic is expected to arrive from the east along Twelve Mile Road. The impact of project-related vehicles on Goolma Road mid-block capacity and level of service has been assessed. For the cumulative traffic impact assessment scenario, the mid-block capacity of the Goolma Road section south of the new Goolma Road/Twelve Mile Road intersection, would deteriorate from LOS B to LOS D. However, this will only be during the scenario where the peak construction activity for all three projects overlaps. The level of service will return to the baseline traffic conditions once peak construction period is over.

As part of the Uungula Wind Farm development, the existing Goolma Road/Twelve Mile Road intersection will be relocated approximately 400 m to the north, which will improve traffic safety for all motorists.

Austroads intersection turn treatment warrants were conducted for left and right turning traffic from the realigned Twelve Mile Road into the proposed site access. The assessment revealed that for the cumulative traffic impact assessment including Uungula Wind Farm construction traffic, a BAL and CHR (S) type turn treatments will be required on Twelve Mile Road. The proposed site access will have adequate sight distances to the left and right along Twelve Mile Road and would meet the Austroads (2021) *Guide to Road Design.*

It should be noted that the concept plan for the site access intersection has been prepared based on the single stage project whereby the maximum construction traffic generation will occur at the site. This is a conservative assessment. If the project proceeds in two separate stages, a shorter right turn bay may be suitable subject to further design consideration. However, the proposed site access should not be operational until the existing two vehicular connections between Goolma Road and Twelve Mile Road is closed off.

References

Austroads. (2016). *Guide to Traffic Management Part 3: Traffic Studies and Analysis.*

Austroads. (2017). *Guide to Road Design Part 4A: Unsignalised & Signalised Intersections.*

GHD. (2021). *Wellington North Solar Project Development.* Traffic Impact Assessment.

HCM. (2016). *Highway Capacity Manual.*

RTA. (2002). *Guide to Traffic Generating Developments.*

Samsa Consulting. (2020). *Uungula Wind Farm Project.* Transport Assessment.

Appendix A
Stakeholder correspondences

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Abdullah Uddin

Subject: FW: Update on transport issues.

From: James Gilchrist <James.Gilchrist@planning.nsw.gov.au>
Sent: Friday, June 9, 2023 12:00 PM
To: James North <james.north@ampyrenergy.com>
Cc: Dan Couriel <daniel.couriel@dpie.nsw.gov.au>
Subject: Update on transport issues.

Hi James,

I've spoke to the assessment team and have an update for you.

As you know we needed to discuss all options you had provided with our directors to fully understand the issue and formulate our position. Considering all relevant information including construction, operation and decommissioning traffic movement, I can confirm that 'Option B' entrance will be the only acceptable entrance that sufficiently responds to traffic movement and associated environmental impacts of the development.

Moving forward I suggest Ampyr continue with the amended report to reflect 'Option B' as the entrance for the site from construction through to decommissioning.

Any questions please get in touch.

James

James Gilchrist
Case Manager
Delivery, Coordination, Digital and Insights |Planning Group |**Department of Planning and Environment**
T 02 9995 6133 | **E** james.gilchrist@planning.nsw.gov.au
4 Parramatta Square | 12 Darcy Street | Parramatta NSW 2150
www.dpie.nsw.gov.au
I work flexibly. Unless it suits you, I don't expect you to read or respond to my emails outside of your normal work hours.

Hi Apoorv, Piers,

Just so you know, DRC has given its written consent of our Twelve Mile Road entrance point design below, which follows up on approval over the phone.

Cheers,

James North | Project Manager - BESS Development
mobile +61 456 596 745
email james.north@ampyrenergy.com
AMPYR Australia Pty Ltd
38 Young Street, Sydney NSW 2000, Australia
www.ampyrenergy.com

From: Dennis Valantine <Dennis.Valantine@dubbo.nsw.gov.au>
Sent: Monday, June 5, 2023 1:11 PM
To: James North <james.north@ampyrenergy.com>
Cc: Claire Burnes <cburnes@emmconsulting.com.au>
Subject: RE: Wellington South BESS - Entrance Concept Discussion

Hi James

I concur with the proposed Twelve Mile Road / Access Road , Wuuluman – Concept intersection design as shown on Project J210534, Drg. EMM-C01,C02,C03 and C04 Rev A. dated 04/05/2023.

Please find attached some road and intersection plans from the Twelve Mile Road upgrade to the Goolma Road intersection which may be of assistance.

Regards
Dennis

Dennis Valantine
Senior Traffic Engineer
Infrastructure Strategy & Design | Dubbo Regional Council
P 02 6801 4930 | M 0418 244 350
Dennis.Valantine@dubbo.nsw.gov.au
http://dubbo.nsw.gov.au

How was your experience today? Click an icon to let us know!

We acknowledge the Wiradjuri people, the traditional custodians of the land. We pay respects to Elders past, present and emerging of the Wiradjuri Nation.

From: James North <james.north@ampyrenergy.com>
Sent: Monday, 5 June 2023 11:30 AM
To: Dennis Valantine <Dennis.Valantine@dubbo.nsw.gov.au>
Cc: Claire Burnes <cburnes@emmconsulting.com.au>
Subject: RE: Wellington South BESS - Entrance Concept Discussion

Hi Dennis,

Would you be able to confirm your team is happy with the design of the entrance point as attached and previously shared?

Cheers,

James North | Project Manager - BESS Development
mobile +61 456 596 745
email james.north@ampyrenergy.com
AMPYR Australia Pty Ltd
38 Young Street, Sydney NSW 2000, Australia
www.ampyrenergy.com

From: James North
Sent: Tuesday, May 30, 2023 2:13 PM
To: dennis.valantine@dubbo.nsw.gov.au
Cc: Claire Burnes <cburnes@emmconsulting.com.au>
Subject: RE: Wellington South BESS - Entrance Concept Discussion

Hi Dennis,

Thanks for your message a bit over a week ago. Hope you're feeling well.

I was calling regarding two items.

Firstly, I'd appreciate your email feedback regarding the entrance way drawings we sent on 12/5/23. As I understand it, your team is happy with it, just wanted to confirm via email.

Secondly, would you be available for a quick chat around the scenario we'd face if the Uungula Wind Farm doesn't go ahead? On teams would be good as I'd be able to talk you through the maps/drawings available.

Cheers,

James North | Project Manager - BESS Development
mobile +61 456 596 745
email james.north@ampyrenergy.com
AMPYR Australia Pty Ltd
38 Young Street, Sydney NSW 2000, Australia
www.ampyrenergy.com

From: James North
Sent: Friday, May 12, 2023 8:52 AM
To: dennis.valantine@dubbo.nsw.gov.au

Abdullah Uddin

From: Andrew McIntyre <Andrew.McIntyre@transport.nsw.gov.au>
Sent: Friday, 7 October 2022 2:22 PM
To: Abdullah Uddin
Cc: James North; Development West; Dennis.Valantine@dubbo.nsw.gov.au; May Patterson; Damien Pfeiffer
Subject: FW: WST21/00231/02: RE: Uungula Wind Farm - Goolma Road/ Twelve Mile Road intersection upgrade
Attachments: Appendix B - Goolma Road&SiteAccessIntersection.pdf; Appendix C - Goolma Road&TwelveMileRdIntersection.pdf; J210534_WellingtonBESS_Scoping-Report_V3.0.pdf; TfNSW Response to request for SEARS for Wellington South BESS.pdf

Dear Abdullah

Thanks for your time on the phone earlier this week.

As discussed, TfNSW's strong preference is for BESS vehicular access to be obtained from Twelve Mile Road. The proposed realigned intersection of Twelve Mile/Goolma Road will provide a safe location to enter and exit Goolma Rd. The new intersection location is on a straight alignment of road and will achieve safe intersection sight distance. If it is not possible for the BESS to obtain access to Twelve Mile Rd, we can look at the proposal put forward by EMM further, however, as discussed, TfNSW would not support the proposed intersection over lapping and/or in close proximity to the existing Twelve Mile/Goolma Rd intersection. Also as discussed, the super elevation of the curve and vertical clearance, whilst not insurmountable, present significant challenges to the design and build cost. Any changes to the existing Goolma/Twelve Mile intersection without the new realigned intersection being built, would require community consultation.

TfNSW would welcome the opportunity to review your EIS and TIA and in this regard, supports the EIS being placed on public exhibition.

Regards

Andrew McIntyre
Manager, Development Services
West Region
Transport for NSW

T 0417 431 982
E andrew.mcintyre@transport.nsw.gov.au

transport.nsw.gov.au
Level 1, 51-55 Currajong Street, Parkes

From: Andrew McIntyre
Sent: Wednesday, 28 September 2022 4:31 PM
To: Abdullah Uddin <auddin@emmconsulting.com.au>; Development West <development.west@transport.nsw.gov.au>
Cc: Claire Burnes <cburnes@emmconsulting.com.au>; May Patterson <May.Patterson@planning.nsw.gov.au>
Subject: FW: WST21/00231/02: RE: Uungula Wind Farm - Goolma Road/ Twelve Mile Road intersection upgrade

Dear Abdullah

Thanks for your email and apologies for the delay in my response.

An access intersection on Goolma Road (MR 633) at the location proposed to service the BESS is not supported by TfNSW and TfNSW would not grant its concurrence pursuant to section 138(2) of the Roads Act 1993 for the access as proposed. As previously advised, direct vehicular access to the BESS from Goolma Road is problematic due to the sight distance limitations, challenging topography and alignment and proximity to and conflict with the existing Twelve Mile Rd/Goolma Rd intersection. In this regard, TfNSW cannot be confident that safe access can be provided directly from Goolma Road without significant works potentially involving earth works and road realignment, if at all.

In this regard, TfNSW confirms that safe access can be provided to the site via the proposed realigned Twelve Mile Road and its proposed intersection with Goolma Road. Whilst this work is proposed to be undertaken by the proponent of the Uungula Wind Farm, it does not prevent another party from undertaking this work. TfNSW notes that the road reserve for the realigned Twelve Mile Road has already been secured and gazetted for road purposes by Dubbo Regional Council. As highlighted in our response to SEARs attached, The TIA submitted as part of the EIS will need to demonstrate whether the proposed intersection treatment proposed as part of the Twelve Mile Road realignment can accommodate the cumulative traffic impacts generated by all users of the Twelve Mile/Goolma Road intersection, including traffic generated by the Wellington BESS, and, include measures to ensure the intersection can accommodate additional traffic generated by the BESS.

Regards

Andrew McIntyre
Manager, Development Services
West Region
Transport for NSW

T 0417 431 982
E andrew.mcintyre@transport.nsw.gov.au

transport.nsw.gov.au
Level 1, 51-55 Currajong Street, Parkes

From: Abdullah Uddin <auddin@emmconsulting.com.au>
Sent: Friday, 23 September 2022 1:45 PM
To: Andrew McIntyre <Andrew.McIntyre@transport.nsw.gov.au>; Development West <development.west@transport.nsw.gov.au>

Cc: Claire Burnes <cburnes@emmconsulting.com.au>
Subject: FW: Uungula Wind Farm - Goolma Road/ Twelve Mile Road intersection upgrade

Good afternoon Andrew

I am following up my email below on the draft concept plans proposed as part of this project.

Unfortunately DPIE will not release the traffic report for public exhibition, until we receive feedback from TfNSW on the draft concept plans. The project is on hold for this reason which is extremely frustrating as we are trying our level best to get a response from TfNSW.

In summary (please refer to the attachments):

1. Scoping report
2. Appendix B – Goolma Road/ Site access intersection concept plan
3. Appendix C – Goolma Road/ Twelve Mile Road intersection (this will only be required if Uungula Wind Farm does not proceed).

I am happy to run though both the plans at a Teams meeting if it is convenient. Please let me know.

Reiterating my previous point, would you kindly respond to this email so that the our traffic report could be released by DPIE for public exhibition where you will get a chance to formally respond to our traffic report.

Best Regards

Abdullah Uddin
Associate Traffic Engineer | National Technical Leader - Transport
CPEng, RPEQ

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E auddin@emmconsulting.com.au
Connect with us

SYDNEY | Ground floor, 20 Chandos Street, St Leonards NSW 2065

From: Abdullah Uddin
Sent: Monday, 25 July 2022 3:18 PM
To: Andrew McIntyre <Andrew.McIntyre@transport.nsw.gov.au>
Cc: Claire Burnes <cburnes@emmconsulting.com.au>
Subject: FW: Uungula Wind Farm - Goolma Road/ Twelve Mile Road intersection upgrade

Good afternoon Andrew

Appendix B
Concept plan

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A1

WARNING:
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NOTE:
The CHR(s) has been designed according to standards specified in Austroads Guide to Road Design Part 4A. Distances have been taken with a design speed of 110km/h, according to Table A4.

PLAN
SCALE 1:500

FINALISATION OF THE DESIGN WILL BE BASED ON "AS EXECUTED DRAWINGS" OR DESIGN PLANS FROM THE UUNGULA PROJECT.

FOR APPROVAL

SHEET INDEX

SHEET No	DESCRIPTION	REV
EMM - C01	PROPOSED LAYOUT	A
EMM - C02	CONCEPT SWEPT PATH	A
EMM - C03	CONCEPT SISD	A
EMM - C04	CONCEPT PROPOSED INTERNAL LAYOUT PLAN	A

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Phone # 02 9493 9500

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REV	DATE	COMMENT	DRAWN	REVIEWED
A	04/05/23	COUNCIL COMMENTS CHR(s)	C.J.	A.U.
-	21/04/23	FOR COMMENT	C.J.	A.U.

PROJECT:
GOOLMA ROAD AND TWELVE MILE ROAD, WUULUMAN - CONCEPT INTERSECTION/ACCESS DESIGNS.

DRAWING TITLE:
PROPOSED LAYOUT

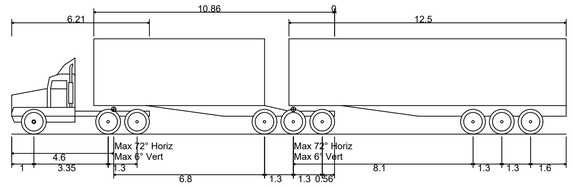
CLIENT: AMPYR Energy
DRG. #: EMM - C01
PROJECT #: J210534
SCALE: AS SHOWN

REV: A

A1

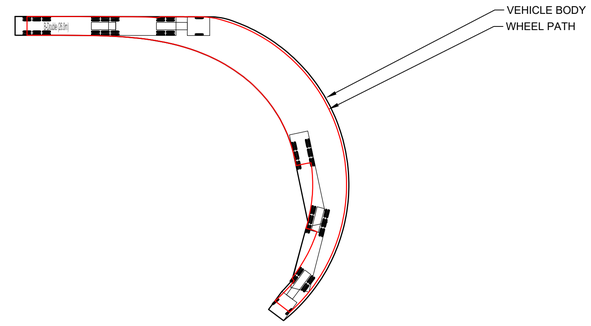
SWEPT PATH 26m B-DOUBLE

SCALE 1:400



B-Double (26.0m)

Overall Length	26.000m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m



The turning paths illustrated in this drawing have been prepared using the Autotrack vehicle modelling software in conjunction with AutoCAD. The vehicle model was prepared by Analytico Pty Ltd based upon vehicle data provided by Austroads. While this modelling represents a conservative assessment of the vehicles ability, it is not possible to account for all vehicle types/characteristics or driver ability.

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REV	DATE	COMMENT	DRAWN	REVIEWED
A	04/05/23	COUNCIL COMMENTS CHR(s)	C.J.	A.U.
-	21/04/23	FOR COMMENT	C.J.	A.U.

PROJECT:

GOOLMA ROAD AND TWELVE MILE ROAD, WUULUMAN - CONCEPT INTERSECTION/ACCESS DESIGNS.

DRAWING TITLE:

CONCEPT SWEPT PATHS

CLIENT: AMPYR Energy

DRG. #: EMM - C02

PROJECT #: J210534

SCALE: AS SHOWN

REV: A

A1

PLAN
SCALE 1:1000

LEGEND

SITE LINE SISD 300m

NOTES:
1. Design speed is 110km/h.
2. Reaction time is 2.5sec
3. SISD 300m as shown in Austroads Guide to Road Design Part 4A Table 3.2

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REV	DATE	COMMENT	DRAWN	REVIEWED	REV	DATE	COMMENT	DRAWN	REVIEWED
A	04/05/23	COUNCIL COMMENTS CHR(s)	C.J.	A.U.					
-	21/04/23	FOR COMMENT	C.J.	A.U.					

PROJECT:
GOOLMA ROAD AND TWELVE MILE ROAD, WUULUMAN - CONCEPT INTERSECTION/ACCESS DESIGNS.

DRAWING TITLE:
CONCEPT SISD

CLIENT: AMPYR Energy
DRG. #: EMM - C03
PROJECT #: J210534
SCALE: AS SHOWN

REV: A

A1

PLAN
SCALE 1:1000

WARNING:
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REV	DATE	COMMENT	DRAWN	REVIEWED	REV	DATE	COMMENT	DRAWN	REVIEWED
A	04/05/23	COUNCIL COMMENTS CHR(s)	C.J.	A.U.					
-	21/04/23	FOR COMMENT	C.J.	A.U.					

PROJECT:
GOOLMA ROAD AND TWELVE MILE ROAD, WUULUMAN - CONCEPT INTERSECTION/ACCESS DESIGNS.

DRAWING TITLE:
CONCEPT PROPOSED INTERNAL LAYOUT PLAN

CLIENT: AMPYR Energy
DRG. #: EMM - C04
PROJECT #: J210534
SCALE: AS SHOWN

REV: A

Australia

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D.2 Updated biodiversity development assessment report

D.3 Noise and vibration memorandum letter

Ground floor 20 Chandos Street
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21 July 2023

James North
Project Manger
AMPYR Australia
38 Young Street
Sydney NSW 2000

Re: Addendum Noise Impact Assessment - Alternate access arrangement

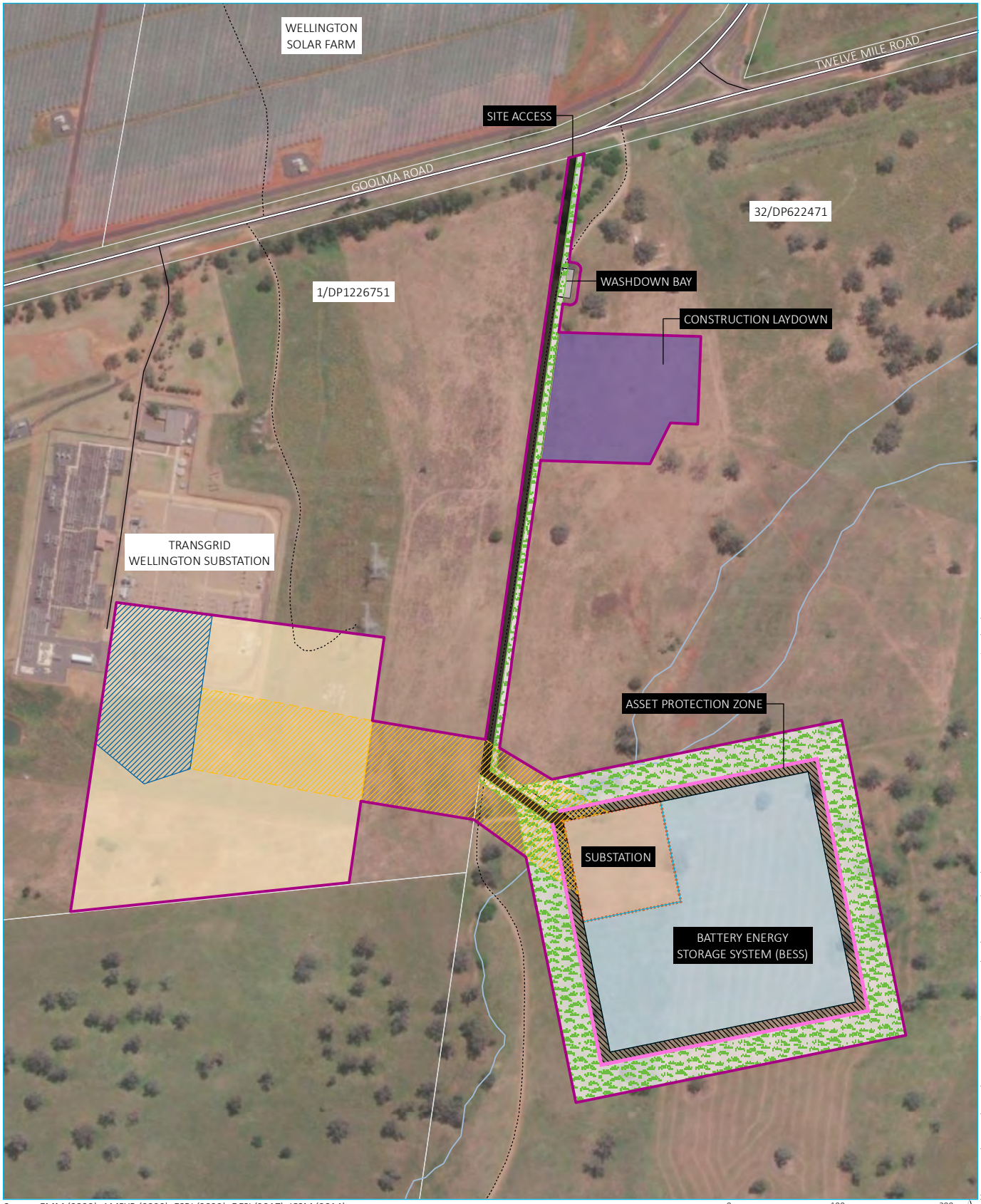
Dear James,

1 Introduction

This Addendum Noise Impact Assessment (ANIA) is to address the potential noise impacts from an alternate site access for construction, operation and demobilisation access via Twelve Mile Road at the eastern side of the site (refer Figure 1.1). The main purpose of this ANIA is to compare the potential noise impacts from the design option considered in the EIS (access via Goolma Road) (EIS NVIA) [1] to this alternate access option via Twelve Mile Road.

This ANIA considers both the changes to construction noise from the realignment, and road traffic noise on R1 from additional traffic on Twelve Mile Road. The assessment of the alternate access option also provided the opportunity to further refine the noise model to capture only construction vehicles on the site access road, rather than the full schedule of construction plant and equipment across the whole disturbance area.

[1] EMM Consulting 2022 – Wellington South Battery Energy Storage System. Noise and Vibration Impact Assessment v4 October 2022



Source: EMM (2022); AMPYR (2022); ESRI (2022); DFSI (2017); ICSM (2014)

0 100 200 m

GDA 1994 MGA Zone 55

N

\\emmsvr1\EMM3\2021\J210534 - Wellington BESS\GIS\02_Maps_EIS\EIS007_EISProjectOverview_20221007_11.mxd 20/10/2022

KEY

- Development boundary

Project components

- Indicative asset protection zone (10 m)
- Indicative transmission connection corridor
- Indicative TransGrid substation upgrade core infrastructure area
- Indicative TransGrid substation upgrade disturbance area
- Battery Energy Storage System (BESS) (battery rows offset at 6 m spacing and setback from substation)
- Substation
- Washdown bay
- Construction laydown
- Indicative landscaping (post construction)
- Access road
- Indicative location of noise bund

Existing environment

- Major road
- Minor road
- Vehicular track
- Watercourse/drainage line
- Cadastral boundary

Project overview

Wellington Battery Energy Storage System
Addendum noise assessment - Alternate access arrangement
Figure 1.1

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2 Modelling

2.1 Construction

Construction noise levels were predicted using a computer-generated model using Bruel & Kjaer Predictor proprietary modelling software with the ENM link algorithm consistent with the approach adopted in the EIS NVIA, assessment locations of Section 3.1, noise management levels (NML's) documented in Section 4.2 and source noise levels as documented in Section 5.2 of the EIS NVIA. The consideration of the alternative access arrangement via Twelve Mile Road also provided an opportunity to review the construction noise model and refine the inputs for construction traffic on the site access rather than as a portion of the total construction plant and equipment schedule that potentially overstated noise impacts in the EIS and for the alternate Twelve Mile Road access.

2.1.1 Times

Construction of the BESS would be during daytime hours only and has an envisaged duration of up to 12 to 18 months. Key stages in construction of the site will include:

- bulk earthworks, filling, compaction and drainage
- trenching and boring of foundations for battery modules, inverters, transformers (possible location within the TransGrid Wellington Substation site has been considered) and transmission line towers or trenching, subject to design
- modular battery, inverter, transformer and transmission line installation and commissioning
- control building, switch room, operations and maintenance building and substation construction.

2.1.2 Single point predictions

EIS predicted construction noise levels are reproduced in Table 2.1 and updated predictions for the Twelve Mile Road access design are provided in Table 2.2 for standard day periods under noise enhancing 3 m/s wind conditions for the potential worst impact Phase 1 construction works. The construction noise level presented for each assessment location represents the energy-average noise level over a 15 minute period and assumes all plant operating concurrently.

The proponent will manage construction noise levels through construction noise management methods detailed in a construction noise management plan as discussed further in Section 7.1 of the EIS NVIA. Construction is to be during standard hours of 7:00 am to 6:00 pm Monday to Friday, and 8:00 am to 1:00 pm Saturday.

Table 2.1 EIS Predicted construction noise levels – Phase 1 (reproduced from EIS NVIA)

Assessment location	Classification	Period	Predicted construction noise level, dB $L_{Aeq,15min}$	Compliance
R1	Residential	Standard hours	46	+1
R2	Residential	Standard hours	43	yes
R3	Residential	Standard hours	42	yes
R4	Residential	Standard hours	41	yes
R5	Residential	Standard hours	40	yes
R6	Residential	Standard hours	41	yes
R7	Residential	Standard hours	41	yes
R8	Industrial	Standard hours	40	yes
R9	Residential	Standard hours	39	yes
R10	Residential	Standard hours	41	yes
R11	Residential	Standard hours	42	yes
R12	Residential	Standard hours	41	yes
R13	Residential	Standard hours	42	yes
R14	Residential	Standard hours	38	yes
R15	Residential	Standard hours	46	+1
R16	Residential	Standard hours	44	yes
R17	Industrial	Standard hours	44	yes
R18	Residential	Standard hours	42	yes
R19	Residential	Standard hours	41	yes
R20	Residential	Standard hours	43	yes
R21	Residential	Standard hours	37	yes
R22	Residential	Standard hours	35	yes
R23	*Residential*	*Standard hours*	50	*n/a*

Note: Excluding R23 – project related residence.

Table 2.2 Predicted construction noise levels – Phase 1 – Twelve Mile Road

Assessment location	Classification	Period	Predicted construction noise level, dB $L_{Aeq,15min}$	Compliance
R1	Residential	Standard hours	47	+2

Table 2.2 Predicted construction noise levels – Phase 1 – Twelve Mile Road

Assessment location	Classification	Period	Predicted construction noise level, dB $L_{Aeq,15min}$	Compliance
R2	Residential	Standard hours	43	yes
R3	Residential	Standard hours	43	yes
R4	Residential	Standard hours	42	yes
R5	Residential	Standard hours	41	yes
R6	Residential	Standard hours	41	yes
R7	Residential	Standard hours	42	yes
R8	Industrial	Standard hours	40	yes
R9	Residential	Standard hours	40	yes
R10	Residential	Standard hours	41	yes
R11	Residential	Standard hours	42	yes
R12	Residential	Standard hours	42	yes
R13	Residential	Standard hours	43	yes
R14	Residential	Standard hours	38	yes
R15	Residential	Standard hours	46	+1
R16	Residential	Standard hours	44	yes
R17	Industrial	Standard hours	44	yes
R18	Residential	Standard hours	42	yes
R19	Residential	Standard hours	41	yes
R20	Residential	Standard hours	43	yes
R21	Residential	Standard hours	37	yes
R22	Residential	Standard hours	36	yes
R23	*Residential*	*Standard hours*	50	*n/a*

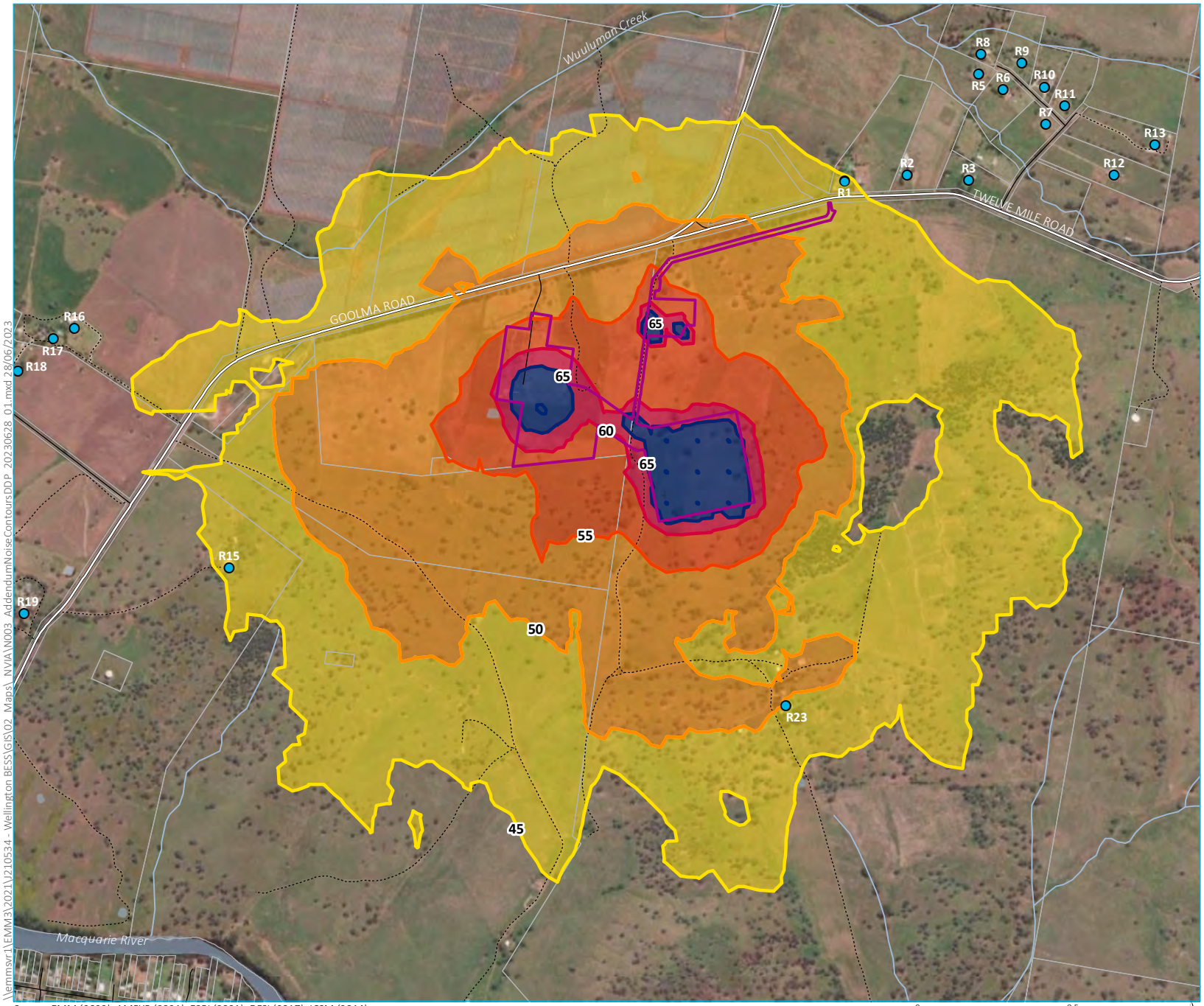
Note: Excluding R23 – project related residence.

The results of the modelling demonstrate predictions of compliance for the majority of assessment locations and negligible (1-2 dB) exceedance for a number of isolated assessment locations (R1 and R15) for both EIS and Twelve Mile Road access designs. It is noted that the predicted construction noise levels represent a potential worst-case scenario, and actual construction noise levels will likely be less than predicted levels most of the time.

Where works outside of standard hours are unavoidable, noise should be managed in accordance with the noise limits of the ICNG. Works outside of standard hours would typically require approval from the relevant regulatory authority and be justified with specialist acoustic assessment of the proposed works to be undertaken.

2.1.3 Noise contours

Predicted $L_{Aeq,15minute}$ noise contours representing the worst-case noise level footprint from the Phase 1 project construction is provided Figure 2.1 (EIS NVIA) and Figure 2.2 (Twelve Mile Road access). The figures represent the predicted construction noise levels under noise enhancing conditions. The contours indicate a limited increase in exposure of construction noise of a negligible 1 dB.



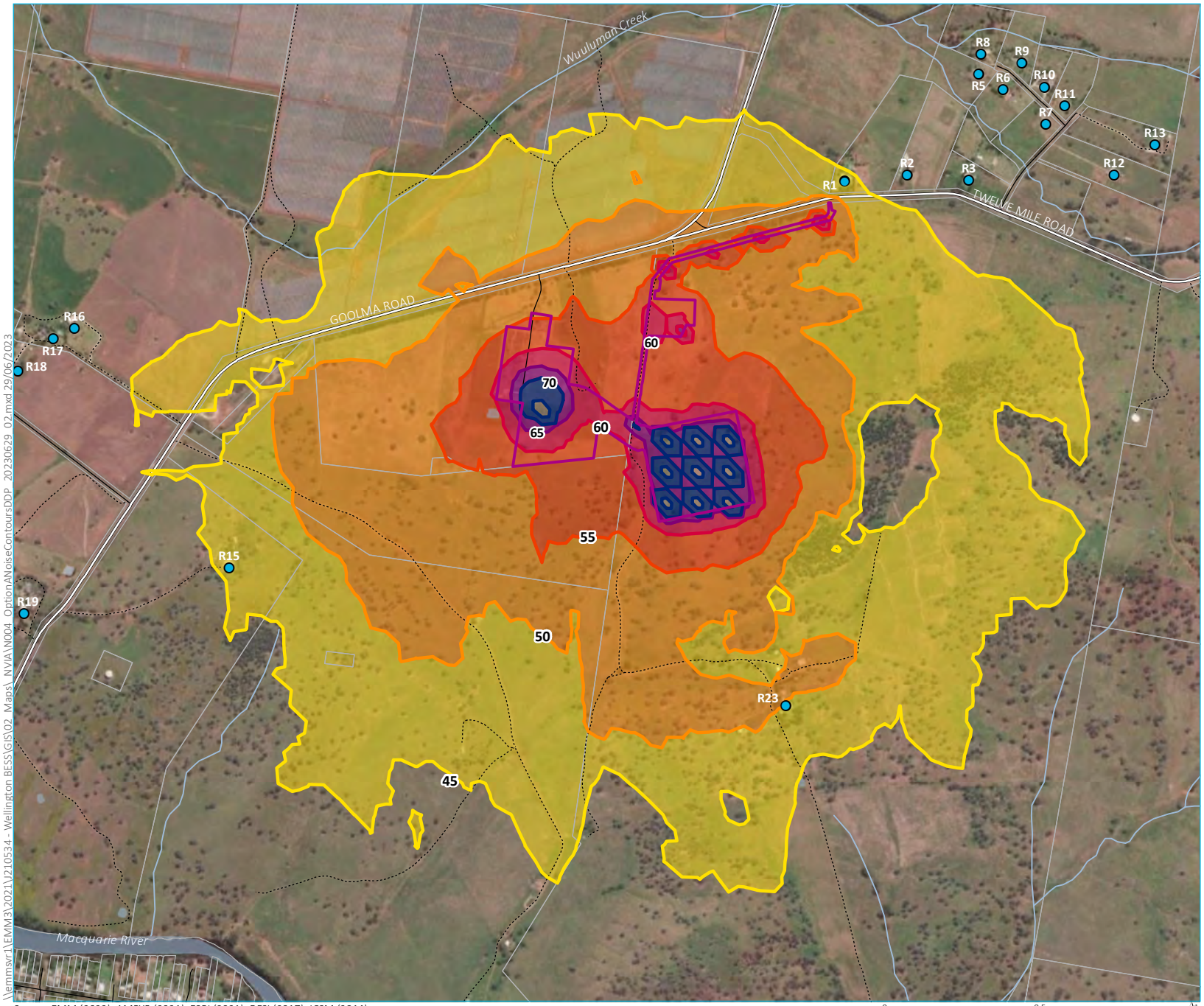
\\emmsvr1\EMM3\2021\210534 - Wellington BESS\GIS\02 Maps\ NVIA\N003 AddendumNoiseContoursDDP 20230628 01.mxd 28/06/2023

Source: EMM (2023); AMPYR (2021); ESRI (2021); DFSI (2017); ICSM (2014)

Construction noise contours, day, 3 m/s wind

Wellington Battery Energy Storage System
Addendum noise assessment - Alternate access arrangement
Figure 2.1

EMM creating opportunities



KEY

- Development boundary
- Noise assessment location
- Major road
- Minor road
- Vehicular track
- Watercourse/drainage line
- Waterbody
- Cadastral boundary

Noise contour - construction - day

- 45 - 50 dBA
- 50 - 55 dBA
- 55 - 60 dBA
- 60 - 65 dBA
- 65 - 70 dBA
- > 70 dBA

Source: EMM (2023); AMPYR (2021); ESRI (2021); DFSI (2017); ICSM (2014)

0 0.5 1 km

GDA 1994 MGA Zone 55

N

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Option A (Twelve Mile Road)
Construction noise contours,
day, 3m/s wind

Wellington Battery Energy Storage System
Addendum noise assessment -
Alternate access arrangement
Figure 2.2

EMM
creating opportunities

2.2 Road traffic noise

A review of Council supplied vehicle classification counts confirmed very low existing traffic volumes on Twelve Mile Road, typically in the order of 16–19 vehicles per hour during peak times (7:00 am – 9:00 am – 16 vehicles; and 4:00 pm – 6:00 pm – 19 vehicles) and a heavy vehicle percentage of 46.2%. It is noted that the vast majority of these heavy vehicles are Class 3 medium vehicles (two axle truck or bus) and would generate lower road traffic noise than the proposed construction heavy vehicles. Accordingly, this addendum assessment has considered the noise contribution from heavy vehicle movements associated with worst case construction activities of up to 9 vehicles per hour compared to existing heavy vehicle movements.

Considering the stop/start nature of the access location and potential impacts on the closest and most exposed residential receiver location (R1 – 59 Twelve Mile Road) and likely maximum speed (km/h), this assessment has conservatively adopted single event levels (SEL) established from the slowing and deceleration/stopping and acceleration of concrete trucks from public roads onto site and site onto public roads at a reference distance of 30 m. These SEL's were established from attended measurements by EMM and tested and accepted under critical review in the Land and Environment Court (No. 17/256851).

The levels adopted were:

- SEL 75Dba – 60 km/h pass by level
- SEL 76dBA – 80 km/h approach/deceleration and entry
- SEL 77dBA – 80 km/h acceleration/depart.

The assessment of construction traffic has considered the reference SEL's at 30 m and calculated back the nearest and only impacted reference assessment location of R1 at 68 m. A review of the projected construction vehicle movements has confirmed a worst case scenario of 6 trucks (12 movements) in one hour.

The results of the calculations confirmed an existing impact of $L_{Aeq,1hr}$ of 46.3 dB; worst case project construction of $L_{Aeq,1hr}$ 47.6 dB and; and cumulatively $L_{Aeq,1hr}$ 50 dB, which is well below the NSW Road Noise Policy day criteria of $L_{Aeq,1hr}$ 55 dB for local roads, and does not require any further mitigation. It is noted that these calculations have considered a worst case SEL for hard acceleration of a concrete truck from a stationary position, and in practice for the subject site $L_{Aeq,1hr}$ noise levels would be anticipated to be lower in context of the road configuration and need to stop approximately 300 m to the north-west of the site when joining Goolma Road from Twelve Mile Road.

3 Conclusion

This addendum noise assessment has considered the potential noise impacts associated with the alternative site access for construction, operation and demobilisation via Twelve Mile Road compared to the EIS alignment via Goolma Road. The assessment has considered construction noise and road traffic noise on Twelve Mile Road.

The results of the assessment have confirmed that there is a potential negligible increase (<1 dB) in construction noise at R1, with a total noise exceedance of the construction NML of 2 dB, which would be considered negligible.

Review of road traffic noise levels utilising a worst case sound exposure level (SEL) has confirmed peak construction traffic would generate a cumulative $L_{Aeq,1hr}$ noise level well below the NSW RNP baseline criteria for local roads of $L_{Aeq,1hr}$ 55 dB.

No additional mitigation measures are required.

Yours sincerely

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