New England Solar and Battery Project

Amendment Report

Prepared for ACEN Australia Pty Ltd

January 2023

New England Solar and Battery Project

Amendment Report

ACEN Australia Pty Ltd

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January 2023

Version	Date	Prepared by	Approved by	Comments
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Approved by

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20 January 2023

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Executive Summary

ACEN Australia Pty Ltd (ACEN Australia) (formerly named UPC Renewables Australia Pty Ltd) has approval to develop the New England Solar and Battery Project; a significant grid-connected solar farm and battery energy storage system (BESS) along with associated infrastructure, approximately 6 kilometres (km) east of the township of Uralla, which lies approximately 19 km south of Armidale, in the Uralla Shire local government area (LGA) (the project). The project was approved, subject to conditions, by the NSW Independent Planning Commission (IPC) on 9 March 2020 (SSD–9255).

ACEN Australia is seeking to modify SSD-9255, pursuant to Section 4.55(2) of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) to:

- amend the project boundary and development footprint;
- increase the project's energy storage capacity;
- increase the number of over-dimensional vehicle movements during construction, upgrading and decommissioning;
- increase the number of daily heavy vehicle movements during construction;
- increase the project's construction hours; and
- amend the schedule of land.

These proposed amendments were detailed in a modification report (EMM 2022) which was placed on public exhibition by the NSW Department of Planning and Environment (DPE) in November 2022.

Since the submission of the modification report (EMM 2022), ACEN Australia has identified an additional approximately 8.9 ha of land suitable for inclusion in the project boundary and development footprint. This land has recently been acquired by a project landholder, as a result of the closure of three Crown 'paper' roads, and adjoins the existing approved project boundary and/or modification area. ACEN Australia is seeking inclusion of this additional 8.9 ha of land within the proposed amended project boundary and development footprint as part of the proposed modification to the project.

This amendment report outlines the assessment of the potential impacts of the proposed inclusion of the additional land. The assessment concluded that the proposed inclusion of the additional land in the project boundary and development footprint is likely to result in minimal additional surface disturbance activities that were not assessed as part of the modification report and supporting assessments. No additional mitigation measures were identified as required.

All aspects relating to environmental management will be undertaken in accordance with the project's environmental management strategy which governs the avoidance, minimisation and management of impacts during construction and ensures the responsibilities and accountabilities for environmental performance are clear.

The proposed modification, including this proposed amendment, is anticipated to result in minimal environmental impacts beyond those previously assessed and approved under SSD-9255. The project (as modified) will remain substantially the same development for which consent was originally granted. As such it is considered the modification can be approved pursuant to Section 4.55(2) of the EP&A Act.

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1 Introduction

1.1 Background

ACEN Australia Pty Ltd (ACEN Australia) (formerly named UPC Renewables Australia Pty Ltd) has approval to develop the New England Solar and Battery Project; a significant grid-connected solar farm and battery energy storage system (BESS) along with associated infrastructure, approximately 6 kilometres (km) east of the township of Uralla, which lies approximately 19 km south of Armidale, in the Uralla Shire local government area (LGA) (the project). The project was approved, subject to conditions, by the NSW Independent Planning Commission (IPC) on 9 March 2020 (SSD–9255).

The project is within the New England Renewable Energy Zone (REZ), which has been formally declared by the NSW Minister for Energy under Section 19(1) of the NSW *Electricity Infrastructure Investment Act 2020*. The New England region of NSW has been selected by the NSW Government for the development of the New England REZ due to its significant natural energy resources and has an intended network capacity of 8 gigawatts (GW).

1.2 Original proposed modification and assessment process

ACEN Australia submitted a modification report in October 2022 (EMM 2022) to support an application to modify SSD–9255 (SSD–9255-Mod-2). The original proposed modification sought to:

- amend the project boundary and development footprint to encompass an additional 127 ha across four parcels of land;
- increase the project's storage capacity from up to 200 MW (AC) by approximately 1,200 MW (AC) to approximately 1,400 MW (AC) (ie from up to 400 MWh to up to 2,800 MWh);
- allow for additional land that could be utilised for adding direct current (DC) solar PV capacity, without changing the solar component of the project's total generating capacity of 720 MW(AC);
- increase the number of over-dimensional vehicle movements during construction, upgrading and decommissioning from 15 to 30;
- increase the number of daily heavy vehicle movements during construction;
- increase the project's construction hours; and
- amend the schedule of land.

The original proposed modification will not change the approved life of project operations. The original proposed modification is described in detail in section 3 of the modification report (EMM 2022).

See Figure 1.1 of the modification report for the regional setting of the project as it relates to the original proposed modification.

The modification report (EMM 2022) was placed on public exhibition by the NSW Department of Planning and Environment (DPE) from 4 November 2022 to 17 November 2022. During the exhibition period, advice was received from nine NSW Government agencies, Uralla Shire Council and Transgrid. Submissions by way of objection were received from two community stakeholders.

In correspondence dated 18 November 2022, DPE requested that ACEN Australia provide a written response to issues raised in the submissions (as required under Section 104 of the NSW *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation)) in the form of a Submissions Report prepared having regard to *State Significant Development Guidelines – Preparing a Submissions Report* (DPE 2021). A separate submissions reports (EMM 2023) has been prepared for this purpose.

Furthermore, due to additional proposed amendments identified by ACEN Australia since the submission of the modification report (detailed in Section 1.3 and Chapter 3 below), DPE requested a separate Amendment Report be prepared having regard to *State Significant Development Guidelines – Preparing an Amendment Report* (DPE 2022).

This amendment report has been prepared to support an application by ACEN Australia to amend modification application SSD–9255-Mod-2, in accordance with Section 37 of the EP&A Regulation.

1.3 Proposed amendments

Since the submission of the Modification Report (EMM 2022), ACEN Australia has identified an additional approximately 8.9 ha of land suitable for inclusion in the project boundary and development footprint. This land has recently been acquired by a project landholder, as a result of the closure of three Crown 'paper' roads, and adjoins the existing approved project boundary and/or modification area. The original proposed modification area has been updated to include the additional land the subject of this amendment report and is shown on Figure C.1.

The proposed inclusion of the additional land in the project boundary and development footprint is not likely to result in 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 inclusion of the additional land to the original modification area is provided in Chapter 3.

1.4 Proponent

ACEN Australia (ACN 616 856 672) is the proponent for the modification. The relevant address is:

ACEN Australia Pty Ltd
Suite 2, Level 2, 13–17 Castray Esplanade
Hobart 7004 Tasmania

2 Strategic context

2.1 Site and surrounds

2.1.1 Regional context

The regional context for the project remains the same as described in section 2 of the modification report (EMM 2022), included below for ease of reference.

The project will be developed within the Uralla Shire LGA. At its closest point, the project boundary is approximately 6 km east of the township of Uralla, and the northern array area starts approximately 8.6 km south of Armidale (Figure 1.1 of the modification report.).

Uralla is the largest township in the Uralla Shire LGA, with a population of 2,728. It is also the Uralla Shire LGA's commercial and administrative centre. In addition to Uralla, a number of small villages also surround the two array areas, including Kellys Plains and Saumarez (north of the northern array area) and Gostwyck and Dangarsleigh (east and south of the central array area, respectively).

Major industries across Uralla, Tamworth and Armidale LGAs include beef-cattle farming, sheep farming, hospitals, teaching, administration and mining. Agriculture accounts for up to 50% of economic activity in some parts of Uralla Shire LGA, although Tamworth and Armidale LGAs have more diverse economies.

The project is in the New England REZ and there are a number of other renewable energy developments proposed in the vicinity of the project including Salisbury Solar Farm (proposed); Armidale BESS (proposed); Oxley Solar Farm (proposed); Metz Solar Farm (in construction); Thunderbolt Wind Farm (proposed); and Thunderbolt Solar Farm (proposed). The closest is Salisbury Solar Farm, which is approximately 2 km south of the central array area; however, the status of this project is not certain with SEARs issued for the project in 2019 and no subsequent assessment documentation published since that time.

2.1.2 Local context

The land in the development footprint is zoned RU1 Primary Production under the *Uralla Local Environmental Plan 2012 (*Uralla LEP) and is predominantly used for agricultural purposes. The majority of lots within the project boundary have been modified by historical land use practices and past disturbances associated with land clearing, cropping and intensive livestock grazing. Land uses surrounding the array areas are predominantly agricultural (ie livestock grazing). Cattle and sheep grazing for wool, breeding stock and meat dominate agricultural activities within the project boundary.

The landform pattern within and surrounding the development footprint can be described as a mix of low rolling hills and flatter areas that are frequently dissected by drainage networks and their adjacent flood plains, terraces and foot slopes. Elevation across the project boundary is variable at approximately 986–1,149 m.

There are 28 non-project related residences within 2 km of the development footprint, with 1 residence within 1 km of the development footprint (Figure 1.1 of the modification report).

2.1.3 Amendment area

As outlined in Chapter 3 , the amendment area is approximately 8.9 ha and extends over three land parcels. All lots within the amendment area are zoned RU1 Primary Production under the Uralla LEP and are freehold land owned by three of the existing project landholders. A revised schedule of lands for the project is provided in Appendix A, Table A.1.

The inclusion of the amendment area will not change the vehicle access route.

The amendment area is illustrated in Figure C.2.

2.2 Strategic planning framework

An overview of relevant policies, plans and strategies and how the project, the proposed modification and proposed amendments align with these, is provided in Table 2.1. We note that the strategic planning framework has remained generally the same since submission of the modification report (EMM 2022).

Table 2.1 Alignment with strategic planning framework

Plan, policy or strategy	Description	Alignment with strategic framework
International context		
The Paris Agreement	*The Paris Agreement* is a legally binding international treaty designed to strengthen international efforts to limit the effects of climate change. It aims to hold the global increase in temperature to below 2 degrees Celsius (^{0}C) above pre-industrial levels. The Paris Agreement has been adopted by 196 countries, including Australia, and came into force on 10 December 2016. In June 2022, the Australian Government committed to reduce emissions by 43% on 2005 levels, by 2030. This will put Australia on track to achieve net zero emissions by 2050. This commitment has been legislated through the Commonwealth *Climate Change Act 2022* (CC Act), passed in September 2022.	The project will contribute to meeting Australia's commitments under the Paris Agreement through annual greenhouse gas emissions reductions. Once operational, the project will contribute to annual greenhouse gas emission reductions in the order of 1–1.5 million tonnes per annum. This amount will be dependent on the electricity generating capacity of the project and the emissions intensity of the grid during the project's operations. The proposed modification may help ACEN Australia to optimise the design, overbuild the DC-side of the PV plant and can hence improve the project's energy generation profile and in doing so would maximise potential greenhouse gas emission reductions.
National context		
Large-scale Renewable Energy Target	The Australian Government Clean Energy Regulator administers the Large-scale Renewable Energy Target which incentivises investment in renewable energy power stations such as wind and solar farms. The Large-scale Renewable Energy Target of 33,000 gigawatt 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 gigawatt hours until the scheme ends in 2030, notwithstanding, the Clean Energy Regulator expects large-scale renewable generation could reach up to 40,000 gigawatt hours by the end of 2021.	Once operational, the project is predicted to generate more than 2,000 gigawatt hours of electricity annually, which will make significant contributions towards meeting the Large-scale Renewable Energy Target in future years. The proposed modification will provide ACEN Australia the option of optimising the project design and overbuilding the DC side of the PV plant which can improve the project's energy generation profile (as opposed to increasing its sent out capacity in MW).

Table 2.1 Alignment with strategic planning framework

Plan, policy or strategy	Description	Alignment with strategic framework
Integrated System Plan 2022	The *Integrated System Plan 2022* (ISP) prepared by AEMO is a comprehensive roadmap for the NEM and is intended to guide the transformation of the NEM from fossil fuels to firmed renewables.	The project is within the New England REZ, which is identified within the ISP 2022. The ISP 2022 notes that the New England REZ will install 5 GW by 2030, increasing to 10.4 GW by 2040 and is progressing under the NSW Electricity Infrastructure Roadmap. The additional land areas proposed as part of the modification are adjacent to the site for an approved large-scale solar development and provide ACEN Australia the option of optimising the project design and overbuilding the DC side of the PV plant. The additional storage capacity will allow the project to increase its energy storage potential, providing additional firming support and greater network system strength support.
Long-Term Emissions Reduction Plan	In 2021, the Australian Government (2021) released its Long-Term Emissions Reduction Plan to achieve net zero emissions by 2050. The Plan aims at reaching a net zero economy through a technology-based approach, whilst protecting relevant industries, regions and jobs. It is part of an overarching strategy for emission reduction, based on a technology-led approach, which encourages low emissions technology such as renewable energy generation and storage.	It is estimated that, once operational, the project will contribute to annual greenhouse gas emissions reductions in the order of 1–1.5 million tonnes per annum (Mtpa). This amount could increase as a result of the proposed modification. The total greenhouse gas reduction potential of the project will be dependent on the electricity generating capacity of the project and the emissions intensity of the grid during the project's operations.

Table 2.1 Alignment with strategic planning framework

Plan, policy or strategy	Description	Alignment with strategic framework
State context		
NSW Electricity Strategy 2019	The NSW Electricity Strategy is the NSW Government's plan for a reliable, affordable and sustainable electricity future that supports a growing economy. With four of NSW's five remaining coal-fired generators scheduled to close by 2035, starting with Liddell Power Station in 2023 (DPIE 2019), Eraring Power Station in 2025–2026 and Vales Point Power Station in 2028, the strategy outlines a reliable energy system which meets NSW's energy requirements and emission reduction targets. The strategy and its enabling legislation the NSW *Electricity Infrastructure Investment Act 2020* supports the rolling out of REZs and the establishment of a Renewable Energy Zone body, (Energy Corporation of NSW) that will bring together investors and carry out early planning so benefits to local communities are maximised.	The project will contribute to the development of the New England REZ and assist in NSW's renewable energy generation and storage requirements, as well as the NSW Government's emissions reduction targets. In order to enhance system reliability, utility-scale renewable energy generation must be complemented with storage. The proposed modification will increase the capacity of the on-site BESS, such that firm capacity can be provided on demand. For example, if fully built out, the BESS can be configured in a way that provides 4 hours of storage for a 700 MW solar farm. The larger BESS also increases the project's contributions to system security and reliability through the provision of Frequency Control Ancillary Services and reactive power support. It will also enhance the project's capability to participate in the foreshadowed capacity market mechanism currently being considered by Energy Ministers for introduction in 2025. Expansion to 4 hours discharge capability will better match anticipated capacity market requirements for addressing lack of reserve (LOR) conditions. The purpose of the BESS will not change as a result of the proposed modification; however, its capacity to support the network and the dispatchable capability of the project's energy generation profile will increase significantly.
Net Zero Plan Stage 1: 2020–2030	*Net Zero Plan Stage 1 2020–2030* (DPIE 2020a) outlines the NSW Government's plan to grow the economy and create jobs while helping the state to deliver a 35% cut in emissions compared to 2005 levels.	The project contributes to Priority 1 of the Plan: "Drive uptake of proven emissions reduction technologies that grow the economy, create new jobs or reduce the cost of living." The New England REZ is also identified in the Plan as critical in replacing retiring coal fired generators in NSW. The proposed modification will help ACEN Australia: • optimise the project design and improve its energy generation profile; • increase the project's storage capacity contributing to increased system security and reliability; and • maximise potential greenhouse gas emission reductions from the project. The proposed additional BESS infrastructure is likely to be built after the completion of Stage 1 and Stage 2 of construction and will extend the project's overall construction schedule therefore extending the project's construction workforce requirements.

Table 2.1 Alignment with strategic planning framework

Plan, policy or strategy	Description	Alignment with strategic framework
Local and regional context		
New England North West Regional Plan 2036	The intent of the *New England North West Regional Plan 2036* (DPE 2017) is to guide the NSW Government's land use planning priorities and decisions in the New England North West region to 2036. One of the primary goals of the *New England North West Regional Plan 2036* is to diversify the region's economy. To achieve this goal, the plan identifies nine directions, one of which is to grow New England North West as the renewable energy hub of NSW. The plan also establishes priorities for local councils within the New England North West Region to help achieve its overarching goals. One of the priorities identified for Uralla Shire Council is to investigate the potential for wind and solar production and encourage renewable energy opportunities.	The project will contribute to the diversification of the energy sector while strengthening the New England North West region's economy. The proposed additional BESS infrastructure is likely to be built after the completion of Stage 1 and Stage 2 of construction and will extend the project's overall construction schedule therefore extending the project's construction workforce requirements. This will prolong the project's direct and indirect economic benefits within local and regional economies.
Uralla Shire Local Strategic Planning Statement 2021	The *Uralla Shire Local Strategic Planning Statement* plans for the community's economic, social and environmental land use needs to 2040. As identified within the statement, the Uralla Shire LGA is the prime location for the future generation of renewable energy and has been identified as one of the key renewable energy precincts in NSW under the *New England North West Regional Plan 2036*. The continued growth of the renewable energy sector over the next 20 years presents opportunities for Uralla Shire LGA; however, this development needs to be managed to minimise adverse impacts on the local environment and agricultural productivity.	The project will contribute to Planning Priority 5.1 of the *Uralla Shire Local Strategic Planning Statement* (ie to support and manage rural landscapes) and will support the growth of the renewable energy sector within the Uralla Shire LGA. Where possible, the modification area has been sited to minimise impacts on: • biodiversity; • Aboriginal cultural and historical heritage; • productive agricultural land; and • neighbouring residents (including consideration of noise and visual amenity impacts). The additional BESS footprints are within the approved project boundary and development footprint. Therefore, no impacts on biodiversity, Aboriginal cultural and historical heritage or productive agricultural land will occur (ie beyond those that have already been assessed and approved as part of SSD–9255).

3 Descriptions of amendments

3.1 Amendment summary

A comparison between the original proposed modified project and the proposed amendment is provided in Table 3.1. An updated description of the amended project is provided in Appendix A.

Table 3.1 Amended project summary table

Element	Original modified project	Amended project
Project boundary	Area of 3,646 ha as shown in Figure 3.1 of the modification report.	Additional 8.9 ha as shown on Figure C.2, meaning a total area of 3,655 ha.
Development footprint	Area of 2,188 ha as shown in Figure 3.1 of the modification report.	2,194 ha as shown on Figure C.3.
Targeted capacity (solar)	720 MW(AC)	No change to the sent-out capacity (AC). The additional land may allow for an increase in the installed DC-side PV capacity, which allows for the generation profile to be improved, without increasing the total sent out capacity at the grid connection point. To achieve this capacity, PV modules and associated infrastructure will be installed within the modification area (Figure C.1).
Capital investment value	Estimated value of up to $1.268 billion.	No change.
PV modules	Based on a 720 MW (AC) facility, 30% oversizing and 400 W panels, it is anticipated that there will be approximately 2.4 million PV modules.	No change. Note: Due to technology advancements, module outputs are increasing rapidly meaning that the total number of PV modules is unlikely to increase.
Power conversion units (PCUs)	Should the Ingeteam 5 MW PCU block be utilised, it is anticipated that there will be approximately 150 PCUs.	No change. Note: Due to technology advancements and conservative estimates within the EIS, the total number of PCUs is unlikely to increase.
Targeted capacity (BESS)	1,400 MW(AC) two-hour energy storage or 700 MW(AC) four-hour energy storage. To achieve this capacity, additional land within the approved project boundary and development footprint will be used to house BESS infrastructure (Figure 1.2 of the modification report).	No change.
Battery enclosure height	• Small enclosure facility: 3.8 m. • Cabinet facility: 3.8 m. • Large buildings: 7.5 m.	No change.
Grid connection	New cut-in and grid substation connected to Transgrid's 330 kV transmission line.	No change.

Table 3.1 Amended project summary table

Element	Original modified project	Amended project
Construction duration	Construction of the additional BESS infrastructure is anticipated to extend the overall duration of construction. It is anticipated that the construction of the additional BESS infrastructure will be in stages and the duration will be dependent on the timing of the development of the New England REZ and associated infrastructure as well as the market need.	No change.
Construction staging	Stage 1 includes complete construction of the northern array area including the grid substation and is anticipated to take approximately 25 months to complete. Stage 2 includes complete construction of the central array area and is anticipated to take approximately 20 months to complete. Stage 2 also includes the construction of the BESS, which is also anticipated to take approximately 20 months to complete. Stage 2 will commence approximately 12 months after the commencement of site establishment works planned as part of Stage 1. It is anticipated that the additional BESS infrastructure will be built in stages after the completion of Stage 2 (subject to the development of the New England REZ and associated infrastructure and market need). The timing of the additional BESS construction is also likely to be influenced by the staged retirement of coal-fired generation capacity in NSW. The additional heavy vehicle movements and extended construction hours are likely to reduce the duration of the peak construction periods associated with Stage 1 and Stage 2.	No change.
Construction workforce	The project will require a peak construction workforce of up to 700 people. The additional BESS stages that are contemplated post Stage 1 and Stage 2 of the solar farm will result in relatively smaller numbers of workers than the peak solar farm construction workforce.	No change.

Table 3.1 Amended project summary table

Element	Original modified project	Amended project
Commissioning	Not defined.	Commissioning works are the processes and works for commissioning of a section of the solar farm by the contractor prior to sectional completion. It is conducted after the installation of equipment in that section has been completed and ensures all equipment (DC system, trackers, inverters, connection assets) operates satisfactorily, safely and complies with the requirements of the contract with the EPC Contractor as well as all legislation and regulations. The physical on-site works required during commissioning generally fall under testing, inspecting, and monitoring and do not involve audible activities. Change to Definition of "Construction" in Consent Conditions for SSD-9255: *The construction of the development, including but not limited to the carrying out of any earthworks on site and the construction of solar panels and any ancillary infrastructure (but excludes road upgrades or maintenance works to the public road network, building/road dilapidation surveys, installation of fencing, artefact survey and/or salvage, overhead line safety marking, geotechnical drilling, surveying and/or **commissioning works**).*
Over-dimensional and heavy vehicle restrictions	The project will not generate more than: • 84 heavy vehicle movements a day during construction, upgrading and decommissioning; • 30 over-dimensional vehicle movements during construction, upgrading and decommissioning; • 5 heavy vehicle movements a day during operations; or • on the public road network.	No change.
Operational lifespan	The project will operate for in the order of 30 years.	No change.
Operations workforce	The project will require a workforce of up to 15 full-time equivalent personnel during operations.	No change.
Site access	All vehicles associated with the project must travel to and from the site via the New England Highway, Barleyfields Road (north), Big Ridge Road and two site access points off Big Ridge Road (Figure 1.1 of the Modification report).	No change.
Decommissioning	Once the project reaches the end of its investment and operational life, project infrastructure will be decommissioned and the development footprint returned to its pre-existing land use, namely suitable for grazing of sheep and cattle, or another land use as agreed by the project owner and the landholder at that time.	No change.

Notes: 1. Condition 1 of Schedule 3 of SSD-9255 was amended by the Planning Secretary on 28 January 2022 to increase the maximum number of over-dimensional vehicle movements during construction, upgrading and decommissioning from 6 to 15.

3.2 Changes to project boundary and development footprint

The project boundary and development footprint will be extended to accommodate the additional 8.9 ha of land (Figure C.3) acquired by a project landholder (as a result of the closure of three Crown 'paper' roads). The additional 8.9 ha of land that comprises the amendment area will be used for solar arrays or other ancillary infrastructure but will not increase the project's maximum sent out electricity generating capacity. The updated project layout is illustrated in Figure C.4.

The additional lot and DPs that will be included in Appendix 2 of development consent SSD-9255 and their land ownership status is provided in Table 3.2. The locations of the lot and DPs are provided in Figure C.5. A full updated schedule of lands is provided in Appendix A.

Table 3.2 Additions to the schedule of land

Lot/DP	Amendment area	Land owner
5/1254486	4	S.M. Wood Pty Ltd
4/127777	4	S.M. Wood Pty Ltd
5/1254486	5	S.M. Wood Pty Ltd

4 Statutory context

This chapter describes the relevant Commonwealth and State legislation and regulatory framework under which the proposed amendment will be assessed and determined.

4.1 Commonwealth legislation

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is administered by the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) (formerly the Commonwealth Department of Agriculture, Water and the Environment (DAWE)). It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places defined as 'matters of national environmental significance' (MNES). If significant impacts are considered likely, and the action is deemed to be a 'controlled action', the proponent may be asked to provide further information about the proposal.

An assessment of the impacts of the project on MNES, considering cumulative impacts of the construction of the project and the proposed road upgrades was prepared as part of the preparation of the EIS (EMM 2019a) and AR (EMM 2019b). This included assessments of significance for entities which were either recorded or considered as having potential to occur, including:

- One Critically Endangered Ecologically Community (CEEC) – White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and derived native grassland.
- Two vulnerable plant species – Bluegrass (*Dicanthium setosum*) and Austral Toadflax (*Thesium austral*).
- Two critically endangered fauna species – Regent Honeyeater (*Anthochaera phrygia*) and Swift Parrot (*Lathamus discolor*).
- Two vulnerable fauna species – Painted Honeyeater (*Grantiella picta*) and Koala (*Phascolarctos cinereus*).
- Two migratory species – Fork-tailed Swift (*Apus pacificus*) and White-throated Needletail (*Hirundapus caudacutus*).

All assessments concluded that no significant impacts on threatened entities are predicted to result from the project and, subsequently, referral of the project to the Commonwealth Minister for the Environment for assessment was not required.

No threatened or migratory species are anticipated to occur within the modification area and amendment area given a lack of suitable habitat. Plant community type (PCT) 510 can be aligned with White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and derived native grassland; however, the community within the modification area is considered too degraded and does not meet the listing. As such, the proposed modification will not have a significant impact on any MNES as listed in the EPBC Act and consequently has not been referred to DCCEEW.

4.2 NSW State legislation

4.2.1 NSW Environmental Planning and Assessment Act 1979

i Section 4.55(2) modification

The project was approved, subject to conditions, by the IPC on 9 March 2020 (SSD–9255). ACEN Australia is seeking to modify SSD–9255 under Section 4.55(2) of the EP&A Act. Compliance of the proposed modification with the requirements of Section 4.55(2) is summarised in Table 4.1.

Table 4.1 Compliance with Section 4.55(2) requirements

Section 4.55 (2) requirements	Comment
It is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which consent was originally granted and before that consent as originally granted was modified (if at all), and	The proposed modification, including this proposed amendment, is consistent with the objectives of SSD-9255, being the construction and operation of a solar and BESS project. A comparison between the project as approved originally and the project as proposed to be modified is provided in Table 3.1 of the modification report (EMM 2022), an updated comparison of the original proposed modification with the proposed amendment is provided in Chapter 3 of this report. These comparisons demonstrate that the modified project is materially the same as that which was originally approved. The proposed modification: • does not involve an additional and distinct use beyond what was contemplated by SSD-9255; and • the assessment of environmental impacts in Chapter 6 of the modification report (EMM 2022) and section 6 of this report, demonstrates that: – the proposed modification will not significantly change the project's impacts on the environment and has limited impacts to biodiversity, Aboriginal cultural heritage and historic heritage beyond those approved by SSD-9255; – the proposed modification will not significantly change the project's impacts on non-project related residences and has limited amenity impacts (in terms of visual, traffic and construction and operational noise) beyond those approved by SSD-9255; and – where required, additional management and mitigation measures have been proposed to address potential impacts. SSD-9255 was granted in 2020, prior to the declaration of the New England REZ. The proposed modification will enable the project to increase its storage capacity, further contributing to the potential capacity of the New England REZ. The revisions to the project boundary and development footprint (to include the modification area) represent an increase of 8.4% and 6.2%, respectively. As part of the preparation of the modification report (EMM 2022), ACEN Australia has refined the modification area to minimise impacts on planted and remnant native vegetation, paddock trees and Aboriginal cultural heritage sites. The additional BESS footprints are within the approved project boundary and development footprint and will maximise the energy storage potential of the project. No impacts on biodiversity, Aboriginal cultural and historical heritage or productive agricultural land will occur (ie beyond those that have already been assessed and approved as part of SSD-9255). The road upgrades ACEN Australia delivered along the vehicle access route (ie Barleyfields Road and Big Ridge Road) provide for a capacity of up to 1,000 vehicles per day. The proposed increase in the number of heavy and over-dimensional vehicle movements can be made without exceeding this capacity and annual average daily traffic across the vehicle access route will remain within the intended design capacity of 1,000 vehicles. The proposed additional heavy vehicle movements and extended construction hours will help to reduce the duration of peak construction periods associated with Stage 1 and Stage 2, reducing the project's impacts on local accommodation availability.

Table 4.1 Compliance with Section 4.55(2) requirements

Section 4.55 (2) requirements	Comment
It has consulted with the relevant Minister, public authority or approval body (within the meaning of Division 4.8) in respect of a condition imposed as a requirement of a concurrence to the consent or in accordance with the general terms of an approval proposed to be granted by the approval body and that Minister, authority or body has not, within 21 days after being consulted, objected to the modification of that consent, and	ACEN Australia has consulted with NSW Department of Planning and Environment (DPE) as part of the preparation of the modification report (EMM 2022) and this amendment report. DPE confirmed the approval pathway for the modification is by way of Section 4.55(2) of the EP&A Act. Further consultation information is provided in Chapter 5 of the modification report (EMM 2022) and the submissions report (EMM 2023).
It has notified the application in accordance with: • the regulations, if the regulations so require, or • a development control plan, if the consent authority is a council that has made a development control plan that requires the notification or advertising of applications for modification of a development consent, and	Clause 106 of the NSW Environmental Planning and Assessment Regulation 2021 (EP&A Regulation) relates to the notification requirements associated with Section 4.55(2) modifications for SSD. Notice of the application must be published on DPE's website. DPE must also give notice of the modification application to each person who made a submission in relation to the original development application. The modification report (EMM 2022) was placed on public exhibition by DPE in November 2022.
It has considered any submissions made concerning the proposed modification within the period prescribed by the regulations or provided by the development control plan, as the case may be.	All submissions made concerning the proposed modification were reviewed by DPE and forwarded to ACEN Australia. ACEN Australia has separately considered and responded via a submissions report (EMM 2023).

4.3 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*.

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.

ACEN Australia's application to modify SSD-9925 has not yet been determined and therefore amendments can be proposed to the project. Accordingly, in December 2022, DPE advised ACEN Australia that an Amendment Report was required to be submitted, to detail the proposed amendment to the project as a result of the addition of 8.9 ha of land. This Amendment Report has therefore been prepared having regard to the *State Significant Development Guidelines,* 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

Engagement for the proposed amendment has not been undertaken as the proposed amendment is minor in nature. Community engagement for the proposed modification application has been completed generally in accordance with the *Undertaking Engagement Guidelines for State Significant Projects* (DPIE 2021b), as detailed in Chapter 5 of the modification report (EMM, 2022).

6 Assessment of impacts

6.1 Potential impact

The proposed inclusion of the additional land in the project boundary and development footprint is 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 inclusion of the additional land in the modification area is provided in Table 6.1.

Table 6.1 Potential impacts of the inclusion of the additional land in the modification area

Environmental consideration	Impact assessment
Biodiversity	Based on demonstrated vegetation condition within the additional land areas, the existing vegetation mapping has been updated to encompass the additional land. The vegetation zones and plant community types (PCTs) that apply to the additional land include a combination of PCT 510 pasture and exotic grassland. Figure 6.1 of the modification report has been updated to include vegetation mapping within the additional land area (Figure C.6). No additional offsets are required and any residual impacts on biodiversity will be managed through the implementation of the BMP, which will be updated to include reference to the modification area. **No additional mitigation measures are required.**
Aboriginal cultural heritage	An archaeologist and registered Aboriginal parties (RAPs) recently surveyed the additional areas and an addendum to the ACHA has been prepared summarising the key findings of the additional survey work (Appendix D). Pedestrian field transects were completed within defined landform units across the additional land in the modification area. No new Aboriginal objects or areas of archaeological potential were identified. The additional land intersects with one previously recorded site, NE58, a small stone artefact scatter with an associated area of potential archaeological deposit (PAD) (Figure C.7). Consistent with the AHMP, NE58 will be actively avoided, and a protective fence will be erected around the site prior to construction within the modification area and surrounds. Should the proposed modification be approved, the AHMP will be updated to incorporate the additional areas. Management and mitigation strategies and methodologies to protect Aboriginal sites will continue to be implemented in accordance with the AHMP. **No additional mitigation measures are required.**
Historical heritage	The closest historical item to the additional land is HNE20 (Figure C.8). HNE20 reflects the alignment of Old Gostwyck Road. It is visible as a farm track in some places and not visible in others. It is likely that it was never highly constructed and survives only as an ephemeral track. HNE20 does not reach the threshold for local or State significance. An additional 0.1 ha of HNE20 will be impacted by the inclusion of the additional land in the modification area. It is noted that HNE20 was included in the digital photographic archival recording process prior to the commencement of construction. The *Historic Heritage Management Plan* (HHMP) will be updated to include reference to the additional area and the unanticipated finds protocol described in Chapter 3 of the HHMP will apply to the additional area. The protocol provides guidance to construction personnel should works uncover objects and fabric that may be significant. **No additional mitigation measures are required.**
Visual	The inclusion of the additional land is not anticipated to have any significant adverse visual impacts on the locality. The additional land will reduce the distance between C5 and the closest project infrastructure by approximately 40 m. A revised viewshed analysis has been undertaken from the residence represented by Viewpoint 5 (Figure C.9). It is not anticipated to result in any difference in the magnitude of change experienced from this dwelling due to undulation in the landscape between C5 and the modification area. A revised viewshed analysis has been undertaken from Viewpoint 11 to assess whether there will be a significant change in visual impacts from this viewpoint as a result of the inclusion of the additional land (Figure C.10). **No additional mitigation measures are required.**

Table 6.1 Potential impacts of the inclusion of the additional land in the modification area

Environmental consideration	Impact assessment
Noise and vibration	The construction and operational noise models have been updated to include construction works and placement of infrastructure within the additional land area. No changes to the results presented in Section 6.5 of the modification report are required as a result of the inclusion of the additional land within the modification area. The proposed modification is predicted to result in negligible changes to previously assessed construction and operational noise emissions. **No additional mitigation measures are required.**
Transport	The inclusion of the additional land in the modification area will not change the vehicle access route. **No additional mitigation measures are required.**
Hazards and risks	The inclusion of the additional land in the modification area 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	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 additional land in the modification area (Figure C.4). The additional land in the modification area is mapped as land and soil capability (LSC) classes 5 and 6. The LSC classes within the revised modification area include: • 4.2 ha (3% of modification area) of LSC Class 3 (moderate limitations); • 27.9 ha (20% of modification area) of LSC Class 4 (moderate to severe limitations); • 100.1 ha (74% of modification area) of LSC Class 5 (severe limitations); and • 4.1 ha (3% of modification area) of LSC Class 6 (very severe limitations). All project landholders intend to continue with farming activities as the additional areas proposed to be occupied by project infrastructure as part of the proposed modification only account for a portion of their landholdings. The additional land will be removed from agricultural use; however, land management practises will avoid or minimise impacts with adjoining land uses and ensure that land is not precluded from being returned to a productive agricultural use at the end of the operational stage of the project. As noted in Appendix B of the *New England Solar Farm – Amendment Report* (AR) (EMM 2019b), the project will adopt a two-level hierarchical system for erosion and sediment control management and mitigation, consisting of a soil and water management plan (SWMP) supported by a set of progressive erosion and sediment control plans (ESCPs). A similar system will be implemented during the proposed road upgrades as required. **No additional mitigation measures are required.**
Water	The additional land has been adequately considered as part of the surface water assessment undertaken in support of the EIS. Subsequently, no additional assessment is required. A 30 m buffer from each edge of the channel of the third order watercourse that passes through Area 5 will be maintained to minimise potential impacts on downstream water quality and erosion (Figure C.3). As noted in Appendix B of the AR (EMM 2019b), the project will adopt a two-level hierarchical system for erosion and sediment control management and mitigation, consisting of a SWMP supported by a set of progressive ESCPs. **No additional mitigation measures are required.**
Bushfire	The inclusion of the additional land in the modification area will not result in any significant changes to the bushfire risks associated with the construction and operation of the project. The bushfire management and mitigation measures outlined in Appendix B are considered sufficient. **No additional mitigation measures are required.**
Socio-economic	The inclusion of the additional land in the modification area will not change the life of project operations or construction and operational workforce requirements. **No additional mitigation measures are required.**

Table 6.1 Potential impacts of the inclusion of the additional land in the modification area

Environmental consideration	Impact assessment
Air quality	The inclusion of the additional land in the modification area will not result in significant additional construction activities than those previously assessed and approved under SSD-9255 and is unlikely to contribute to additional air quality impacts within the surrounding area. Consistent with Condition 14 of Schedule 3 of SSD–9255, ACEN Australia will minimise dust generated by the project. Any air quality impacts will be minimised and managed through measures outlined in Appendix B. **No additional mitigation measures are required.**
Waste management	The inclusion of the additional land in the modification area will not generate any additional waste than that outlined in the EIS (EMM 2019a) or AR (EMM 2019b). All waste generated by the project will be minimised and managed through the implementation of a waste management plan, as outlined in the EIS (EMM 2019a) and AR (EMM 2019b). **No additional mitigation measures are required.**
Cumulative impacts	The project is in the New England REZ and there are a number of other renewable energy developments proposed in the vicinity of the project. The closest is Salisbury Solar Farm, which is approximately 2 km south of the central array area at its closest point. The inclusion of the additional land in the modification area will not reduce the distance between the project and any other proposed renewable energy developments. The inclusion of the additional land in the modification area will not result in significant additional construction activities than those previously assessed and approved under SSD–9255 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 B. **No additional mitigation measures are required.**

6.2 Additional assessments

No additional assessments are proposed as part of this amendment report.

7 Justification of the amended project

A description of the need and justification for the proposed modification is provided below with regard to biophysical, social and economic factors; the principles of ESD; and the consistency of the proposed modification with the objects of the EP&A Act.

7.1 Justification of additional land

The additional 8.9 ha of land has recently been acquired by a project landholder as a result of the closure of three Crown 'paper' roads adjoining the existing approved project boundary (referred to as Area 5) and part of the proposed area to be included as part of the modification (referred to as Area 4).

Specifically, Area 5 is a former crown road of approximately 20 m width, located between the approved development footprint and a neighbouring property to the north. The inclusion of Area 5 into the development footprint avoids the potential isolation of agricultural land which would be difficult to access and maintain. Not including this parcel of land into the development footprint would hence result in a loss of agriculture land, whereas its inclusion will allow it to be used for sheep grazing during operations.

The remainder represents two sections of former crown roads adjacent to an existing part of the project development footprint and the proposed modification Area 4. This ensures the remaining paddocks outside the development footprint are consistent with existing fence lines and farming practises. It avoids the need for relocation of existing farm fencing.

The additional land provides for greater flexibility during detailed design to allow for example, greater distances between the rows of the solar array, internal road network design, or cable layout designs. The land may be used for solar arrays or other ancillary infrastructure but will not increase the project's maximum sent out electricity generating capacity.

7.1.1 Alternatives

This amendment report examines the potential impacts that may result from the proposed amendment. The proposed amendment will not result in significant environmental, social or economic impacts.

No feasible alternatives to the proposed amendment have been identified. Should the proposed amendment not proceed (ie the 'do nothing' scenario), the potential benefits described within this amendment report will not be realised.

7.1.2 Amendment benefits

The proposed amendment provides greater flexibility in ensuring the project delivers on the energy generation and storage objectives of the New England REZ. It avoids the sterilisation of approximately 9 ha of agricultural land by including it within the project development footprint allowing sheep grazing during operations.

The benefits of the project overall are articulated in the modification report (EMM 2022) and are unchanged by the proposed amendment. This includes economic investment in the local region, direct provision of community benefits, reducing greenhouse gas emissions and enhancing the security of the State's electricity supply.

7.1.3 Ecologically sustainable development

The principles of ESD, for the purposes of the EP&A Act, are provided in Clause 7(4) of Schedule 2 of the EP&A Regulation. The four principles of ESD are:

- Precautionary principle – the precautionary principle states 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.
- Inter-generational equity – the principle of inter-generational equity is that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.
- Conservation of biological diversity and maintenance of ecological integrity – the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making.
- Improved valuation and pricing of environmental resources – improved valuation, pricing and incentive mechanisms should be promoted.

The overall objectives of ESD are to use, conserve and enhance natural resources. This ensures that ecological processes are maintained facilitating improved quality of life, now and into the future. ACEN Australia is committed to the principles of ESD and understands that biophysical, social and economic objectives are interdependent.

The proposed amendment is an alteration to an approved development with minimal additional environmental impact. Where impacts are unavoidable, appropriate management measures (including offsets) have been identified to mitigate any residual impacts.

7.1.4 Precautionary principle

This amendment report has enabled an understanding of the potential impacts of the proposed amendment on biophysical, social and economic factors. The proposed amendment and modification will not result in significant biophysical, social or economic impacts and any residual impacts can be appropriately managed (or offset) in accordance with the relevant conditions of SSD-9255. Additional safeguards to manage the potential impacts of the proposed amendment have been proposed and include:

- a 30 m buffer from each edge of the channel of Julia Gully will be maintained to minimise potential impacts on downstream water quality and erosion.

The additional safeguards for the rest of the modification are noted in the modification report (EMM 2022).

7.1.5 Inter-generational equity

The project and proposed amendment are consistent with the principle of inter-generational equity. The proposed amendment will further contribute to the sustainable transition of electricity generation and storage in NSW to a more reliable, more affordable and cleaner energy future. Once decommissioned, the land within the amendment area and modification area can be rehabilitated to its current use if required, thereby allowing for either continuation of renewable energy generation and storage or a return to agricultural production, both of which would provide benefits for future generations.

7.1.6 Conservation of biological diversity and maintenance of ecological integrity

The potential environmental impacts of the proposed amendment are detailed in this amendment report. The proposed amendment is not expected to cause any significant impacts to threatened species or endangered ecological communities.

No additional ecosystem credits are required to offset the residual impacts of the proposed amendment. Offsets associated with the modification report (EMM 2022) are outlined in Chapter 6 of the modification report (EMM 2022) and will be provided in accordance with the biodiversity offset framework.

Residual impacts on biodiversity will be managed through the implementation of the BMP, which includes measures such as pre-clearance surveys and standard erosion and sediment control and biosecurity management procedures.

7.1.7 Improved valuation and pricing of environmental resources

The proposed amendment is an alteration to an approved development. The proposed amendment and modification are anticipated to result in minimal environmental impacts beyond those previously assessed and approved under SSD–9255. Once operational, the solar farm infrastructure within the amendment and modification area will contribute to the sustainable transition of electricity generation and storage in NSW to a more reliable, more affordable and cleaner energy future.

7.2 Justification of the project as a whole

The justification of the project overall is articulated in the modification report (EMM 2022) and is unchanged by the proposed amendment. This includes consideration of the Commonwealth and NSW government strategic planning and policy objectives, economic investment in the local region, direct provision of community benefits, reducing greenhouse gas emissions and enhancing the security of the State's electricity supply.

All aspects relating to environmental management will continue to be undertaken in accordance with SSD–9255.

The project's environmental management strategy (Condition 1 of Schedule 4 of SSD-9255) governs the avoidance, minimisation and management of impacts during the construction and ongoing operation of the project and establishes clear responsibilities and accountabilities for environmental performance. The strategy will continue to be implemented and will encompass the activities proposed as part of the modification, including the proposed amendment.

The proposed modification, including the proposed amendment, has been designed to avoid and minimise adverse biophysical, social and economic impacts, where possible and is not anticipated to significantly change previously assessed and approved impacts under SSD–9255.

The proposed modification, including the proposed amendment, is 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

EMM 2019a, *New England Solar Farm – Environmental Impact Statement.* Prepared by EMM for UPC\AC

2019b, *New England Solar Farm – Amendment Report.* Prepared by EMM for UPC\AC

2022, *New England Solar and Battery Project – Modification to development consent SSD*-9255. Prepared by EMM for ACEN Australia

2023, *New England Solar and Battery Project – Submissions Report*. Prepared by EMM for ACEN Australia. EMM

Appendix A
Updated amended project description

EMM
creating opportunities

A.1 Overview

The project involves the development, construction, commissioning and operation of a solar PV electricity generation facility and BESS, which consists of PV modules, batteries, inverters, transformers and associated infrastructure.

The development footprint on Figure A.1 incorporates the land required for:

- the two solar array areas (northern and central);
- a single internal solar array substation (central array) and a single grid substation (northern array);
- associated BESS(s);
- operations and maintenance (O&M) infrastructure, including:
  - O&M buildings (namely meeting facilities, a temperature-controlled spare parts storage facility, supervisory control and data acquisition (SCADA) facilities, a workshop and associated infrastructure); and
  - car parking facilities;
- connection infrastructure between the two array areas (including underground or overhead cabling); and
- a new internal road network to enable access from surrounding local roads to the two array areas during construction and operations.

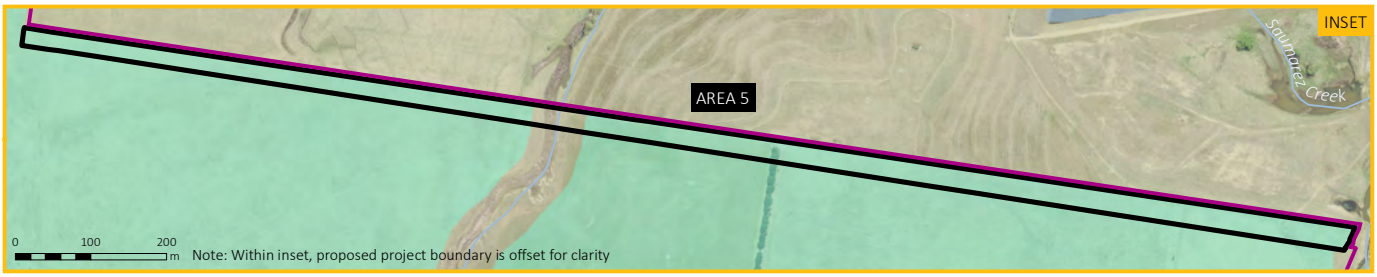
In addition, security fencing and creek crossings (should they be required) will be placed within the project boundary.

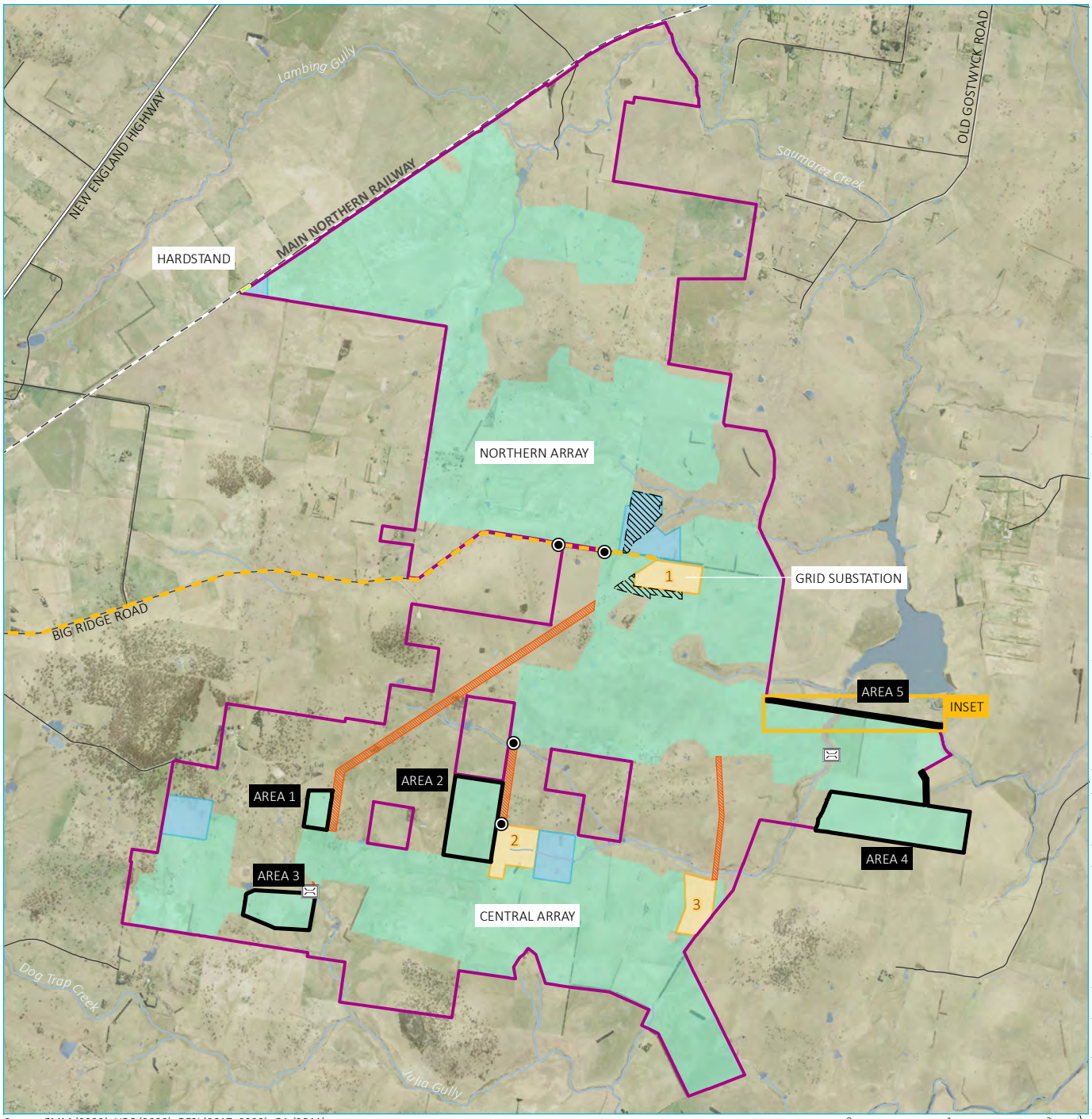
The project will have a targeted 'sent out' electricity generating capacity of up to 720 MW (AC) and up to 1,400 MW (AC) two-hour energy storage which may be configured as 700 MW four-hour energy storage. The final number of PV modules within the two array areas will be dependent on detailed design, availability and commercial considerations at the time of construction.

Electricity generated by the project will be injected into the grid via a new cut-in and grid substation connected to TransGrid's 330 kV transmission line that traverses the northern and central array areas.

The grid substation will be constructed in the northern array (referred to as Location 1 on Figure A.1). The solar array substation within the central array will be constructed in one of two potential locations (referred to as locations 2 and 3 on Figure A.1). It is possible that, following detailed design, the solar array substation within the central array area could be highly reduced in size and complexity or the need for it eliminated altogether, if, for example no intermediate transformation is needed. If this occurs, some of or all of the parcels of land identified as locations 2 and 3 on Figure A.1 will be utilised for PV modules and ancillary infrastructure.

The exact location of the electrical cabling to connect the northern and central array areas will be determined as part of detailed design; however, it will be restricted to the three corridors presented in Figure A.1. Electrical cabling within the three corridors may be buried underground or require the construction of new overhead electricity transmission lines (ETLs).





Source: EMM (2022); UPC (2022); DFSI (2017, 2022); GA (2011)

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KEY

- Proposed project boundary *
- Modification area
- Additional substation/BESS footprint

Proposed development footprint

- Solar array
- Potential site access and electrical cabling
- Potential laydown area/site compound
- Potential substation/BESS footprint **
- Hardstand in rail corridor
- Primary vehicle access route
- Potential creek crossing
- Proposed primary site access point

Existing environment

- Rail line
- Main road
- Local road
- Watercourse/drainage line
- Waterbody

* The extent of Lot 1 of DP 227322 within the development footprint is 205.4 hectares, which represents approximately 8.4% of the total lot. Subsequently, the full extent of Lot 1 of DP 227322 has been excluded from the project boundary.

** The grid substation (location 1) and only one of potential substation location numbers 2 or 3 to be constructed

Proposed project boundary and development footprint

New England Solar and Battery Project
Amendment Report
Figure A.1

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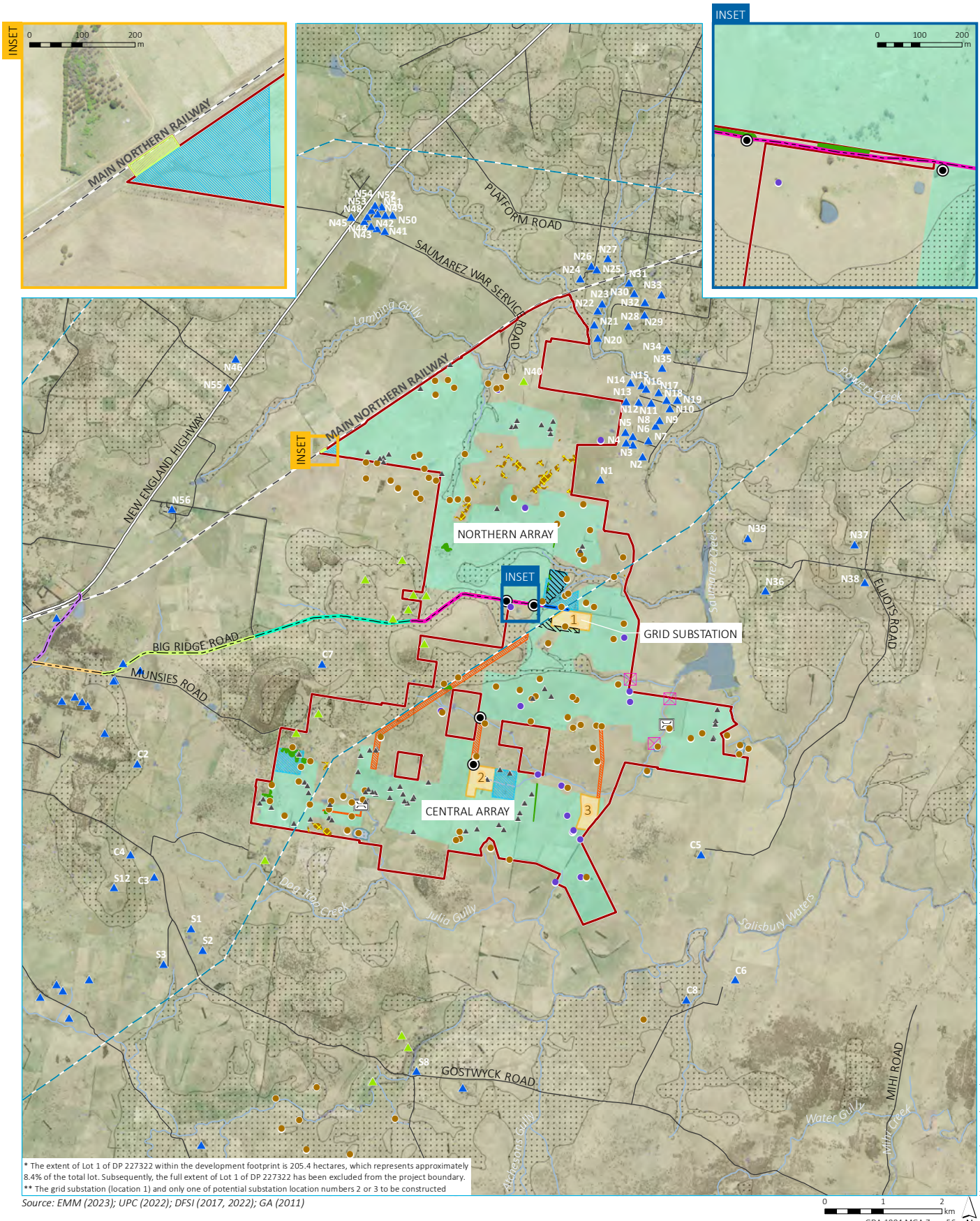

* The extent of Lot 1 of DP 227322 within the development footprint is 205.4 hectares, which represents approximately 8.4% of the total lot. Subsequently, the full extent of Lot 1 of DP 227322 has been excluded from the project boundary.
** The grid substation (location 1) and only one of potential substation location numbers 2 or 3 to be constructed

Source: EMM (2023); UPC (2022); DFSI (2017, 2022); GA (2011)

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KEY

- 330 kV transmission line
- Rail line
- Main road
- Local road
- Watercourse/drainage line
- Waterbody
- Proposed project boundary *
- Additional substation/BESS footprint
- Biophysical Strategic Agricultural Land

Sensitive receptors
- Project-related
- Non-project related

Proposed development footprint
- Solar array
- Potential site access and electrical cabling
- Potential laydown area/site compound
- Potential substation/BESS footprint **
- Hardstand in rail corridor
- Potential creek crossing
- Proposed primary site access point
- Indicative location of security fencing across third order watercourse

- Historic heritage site
- Identified Aboriginal site
- PAD area
- Paddock tree requiring offset
- Plant community requiring offset

Plant community type avoidance area
- PCT 510 woodland

Primary vehicle access route
- Barleyfields Road
- Big Ridge Road - segment 1
- Big Ridge Road - segment 2
- Big Ridge Road - segment 3
- Big Ridge Road - segment 4
- Big Ridge Road - segment 5

Project layout

New England Solar and Battery Project
Amendment Report
Figure A.2

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A.2 Site description

The project will be developed within the Uralla Shire LGA. At its closest point, the project boundary is approximately 6 km east of the township of Uralla, and the northern array area starts approximately 8.6 km south of Armidale.

The project boundary for the development footprint, consisting of the full extent of the involved landholder lots, encompasses a total area of approximately 3,655 ha. A comparison of the approved and proposed project boundary and development footprint areas is illustrated in Figure A.3.

The project boundary intersects land legally described and identified in Table A.1. Based on the current design and lease agreements between ACEN Australia and the project landholders, no subdivision is proposed on the lots identified within Table A.1, with the exception of land required for the grid substation.

Table A.1 Schedule of land

Lot	Deposited plan (DP)	Lot	Deposited plan (DP)
2	DP567937	4	DP172594
154	DP755827	B	DP172594
79	DP755814	78	DP755814
109	DP755827	84	DP755814
108	DP755827	83	DP755814
89	DP755827	80	DP755814
103	DP755827	181	DP755827 (Area 3)
101	DP755827	182	DP755827
102	DP755827	97	DP755827
90	DP755827	2	DP127777
113	DP755827	1	DP127777
91	DP755827	39	DP755827
111	DP755827	38	DP755827
110	DP755827	5	DP127777 (Area 4)
93	DP755827	1	DP405515
92	DP755827	37	DP755827
98	DP755827	296	DP755827
122	DP755827	221	DP755814
123	DP755827	2	DP174053
125	DP755827	1	DP227322
124	DP755827	8	DP173619
126	DP755827	6	DP172594
150	DP755827 (Area 1)	21	DP1167870

Table A.1 Schedule of land

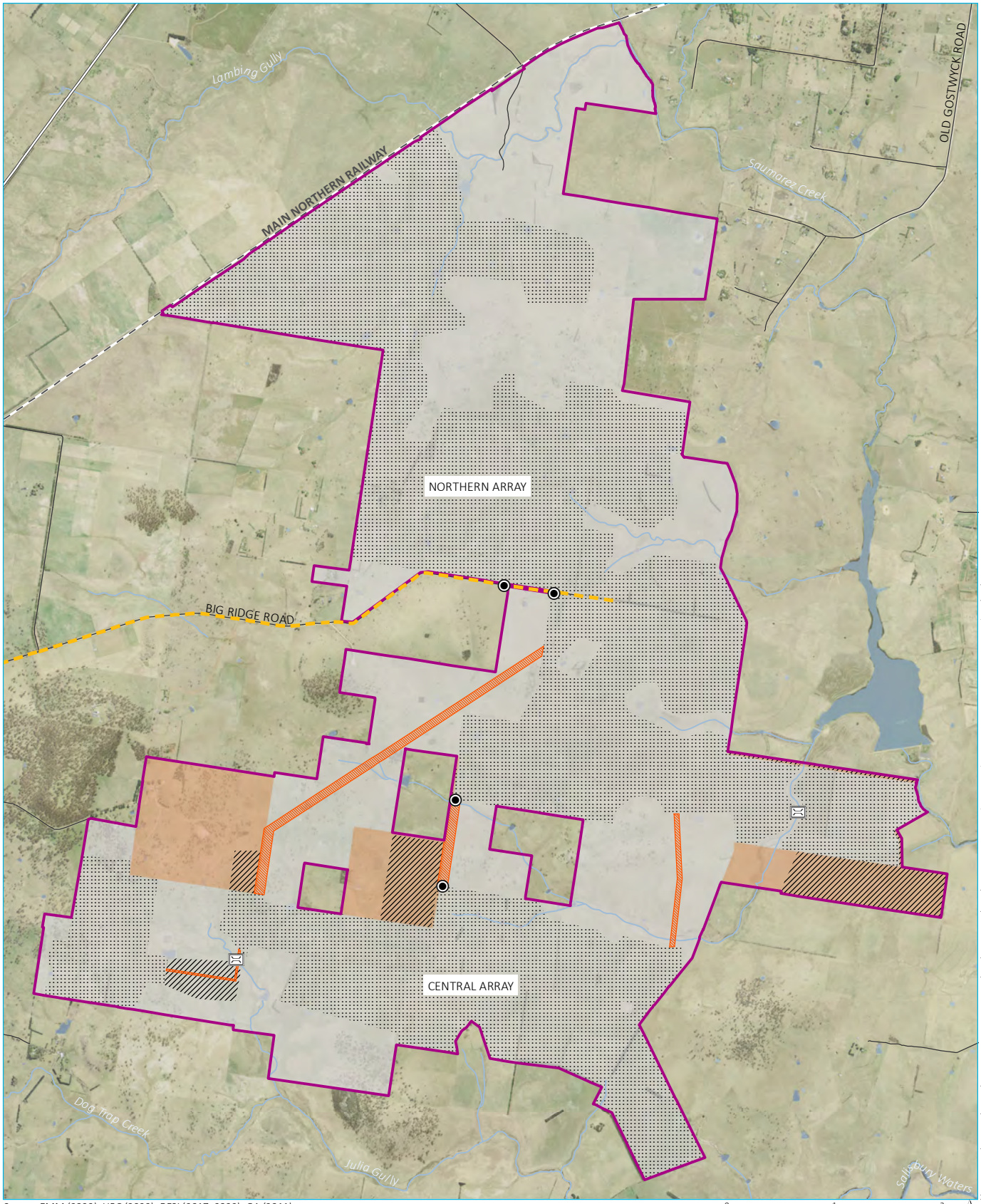
Lot	Deposited plan (DP)	Lot	Deposited plan (DP)
120	DP755827 (Area 2)	23	DP1171290
101	DP1262005 (Area 3)	24	DP1171290
2	DP127778 (Area 4)	119	DP755827 (Area 2)
36	DP755827 (Area 4)	112	DP755827 (Area 2)
5	DP1254486 (Area 4, Area 5)	1	DP319048 (Area 4)
22	DP1286357	3	DP127777 (Area 4)
		4	DP127777 (Area 4)

Notes: Grey highlight indicates lots within the modification area and amendment area.

The development footprint is the area within the project boundary on which infrastructure will be located (with the exception of areas of avoidance identified in the EIS, AR, modification report and supporting technical assessments). The development footprint encompasses a total area of 2,195 ha, which will incorporate rows of PV modules and areas associated with power conversion units (PCUs), space between the rows, internal access tracks and associated infrastructure (including substations and BESSs). The development footprint also includes land required for connection infrastructure between the two array areas as well as land required for new internal roads to enable access to the two array areas from the surrounding road network. Subject to detailed design and consultation with the project landholders, security fencing and creek crossings may be required on land outside of the development footprint, but within the project boundary.

The land within the project boundary is zoned RU1 Primary Production under the Uralla LEP (Figure 4.1 of the modification report (EMM 2022)). The project boundary encompasses 77 lots, the majority of which have been modified by historical land use practices and past disturbances associated with land clearing, cropping and intensive livestock grazing. The properties within the project boundary are currently primarily used for sheep grazing for production of wool and lambs, with some cattle grazing for beef production.

A very small part of the land within the development footprint is mapped bushfire prone by Uralla Shire Council (Figure 4.1 of the modification report (EMM 2022)).



Source: EMM (2023); UPC (2022); DFSI (2017, 2022); GA (2011)

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KEY

- Proposed project boundary *
- Potential site access and electrical cabling
- Primary vehicle access route
- Potential creek crossing
- Proposed primary site access point

Project boundary comparison

- EIS approved project boundary
- Modified project boundary (MOD 1 and MOD 2)

Development footprint comparison

- EIS approved development footprint
- Modified development footprint (MOD 1 and MOD 2)

Existing environment

- Rail line
- Main road
- Local road
- Watercourse/drainage line
- Waterbody

* The extent of Lot 1 of DP 227322 within the development footprint is 205.4 hectares, which represents approximately 8.4% of the total lot. Subsequently, the full extent of Lot 1 of DP 227322 has been excluded from the project boundary.

Comparison of project boundary and development footprint - approved and modified

New England Solar and Battery Project
Amendment Report
Figure A.3

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The project is ideally located close to TransGrid's 330 kV transmission line, which passes through the array areas (Figure A.1). It also has access to the regional road network; including the New England Highway (Figure A.1). The primary site access points will be from Big Ridge Road (Figure A.1). Emergency access points may also be required, which will be determined during detailed design.

A.3 Project infrastructure

A.3.1 Solar arrays, PV modules, medium voltage cable network and power conversion units

The project will involve the development of two separate arrays of PV modules and PCUs. The number of PV modules and PCUs required will be dependent on the final detailed design of the project; however, based on a 720 MW (AC) facility, 30% oversizing and 400 W panels, it is anticipated that there will be approximately 2.4 million PV modules. The additional land within the modification area that could be utilised for PV arrays may result in the project design incorporating a higher overbuild percentage on the DC-size. Should the Ingeteam 5 MW PCU block be utilised across the two array areas, it is anticipated that there will be approximately 150 PCUs.

PV modules will be installed in a series of rows to maximise the energy yield that is achievable given the solar resource and the ground area available within the array areas. The modules will be fixed to, and supported by, a ground-mounted framing structure, aligned in rows. It is highly likely that single axis tracking technology will be used for the project, based on the technology choices currently available in the market and the recent reductions in the costs associated with this technology. Assuming single axis tracking technology is implemented, the rows of PV modules will be aligned in a north-south direction and spaced out approximately 5–8 m apart. The use of single axis tracking technology would enable the PV modules to rotate from east to west during the day tracking the sun's movement. An example of rows of PV modules utilising single axis tracking technology is provided in Photograph B.1.

Photograph A.1 PV module row with single axis tracking technology

Source: NexTracker (2018)

An alternative configuration for the solar PV infrastructure may be considered for the project, although considered far less likely, namely a fixed tilt system, with the rows aligned east west and the PV modules facing north. However, it is noted that single axis tracking is considered more likely due to the recent fall in technology costs and the superior energy yield associated with this technology. As part of detailed design, ACEN Australia may consider installing a section of the solar arrays using fixed tilt technology in consideration of the interaction between the solar PV generating capacity of the project, the sizing of the BESS and daytime electricity pricing.

The PV modules will be supported on mounting frames consisting of vertical posts (piles) and horizontal rails (tracking tubes). Rows of piles will be driven or screwed into the ground, depending on the geotechnical conditions, and the supporting racking framework will be mounted on top. Pre-drilling and/or cementing of foundations will be avoided if allowed by the geotechnical conditions.

The height of the PV modules at their maximum tilt angle (typically up to 60 degrees) will be up to 4 m. Additional site-specific clearance of up to around 300 mm may be required to avoid flooding risk or to improve access for sheep to graze underneath the PV modules. If installed at this height, the leading edge of each PV module may be up to 1.2 m from the ground. This would enable sheep to graze fully unimpeded underneath the PV module rows and is common practice as part of the latest bifacial PV module technology (which benefits from a higher ground clearance).

It should be noted that this is a highly conservative assumption, which is based on the PV module configuration illustrated in Option A of Plate 2.1. This configuration involves either four PV modules in landscape orientation or two modules in portrait orientation. The more typical configuration using single axis tracking technology is currently a single PV module mounted on the tracker tube in portrait (refer to Photograph 2.1 and Option B of Plate A.1). Should this configuration be selected, the height of the PV modules at their maximum tilt angle would likely be closer to 2–3 m, which includes consideration of additional clearance to allow for sheep grazing.

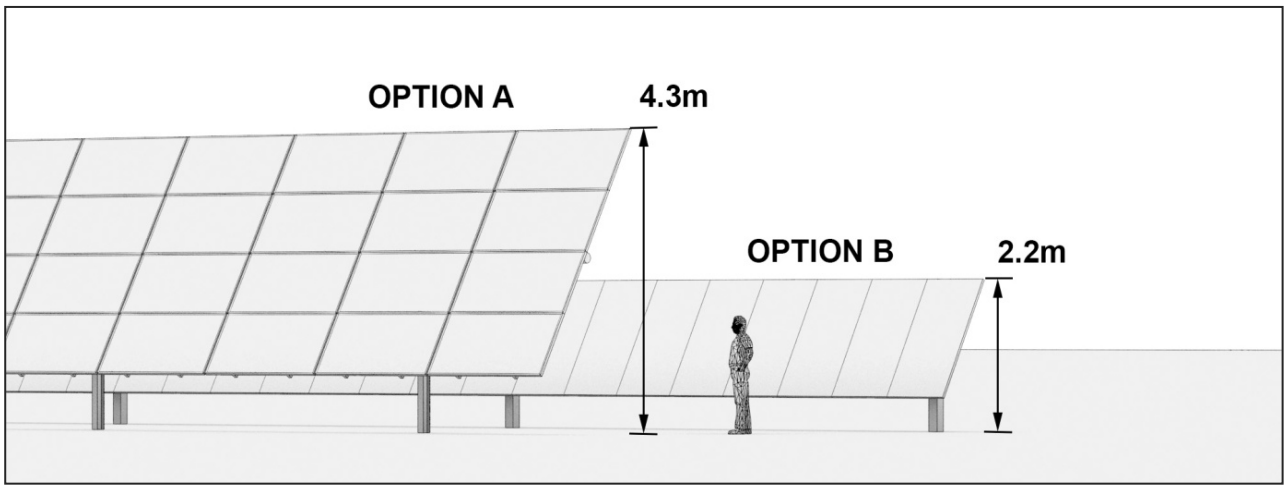


Plate A.1 Example of PV module configurations under consideration for the project

DC cables will connect the PV modules to the PCUs.

The PCUs consist of three key components, namely inverter(s), transformer(s) and a ring main unit. The purpose of each PCU is to convert the direct current (DC) electricity generated by the PV modules into alternating current (AC) form, compatible with the electricity network. PCUs also increase the voltage of the electricity to 11–33 kV. The exact dimensions of the PCUs will be determined during detailed design; however, it is anticipated that each PCU will be approximately 8 m in length by 2.6 m wide by 2.7 m high. Photograph A.2 has been provided as an example of what the PCUs and inverters may look like within the development footprint for the array areas. The exact model used will be determined as part of detailed design.

Photograph A.2 Containerised inverter solution with PV module rows

Source: Ingeteam (2015)

A medium voltage (MV) cable reticulation network will be required to transport the electricity around each of the arrays. If underground, cables of either 11 kV, 22 kV or 33 kV will be installed at a depth of at least 600 mm and will be designed and fitted in accordance with relevant Australian industry standards. Electricity from the MV cable network will be stepped up to high voltage (HV) at either the solar array substation (if required) or the grid connection substation.

New transmission lines, with anticipated voltage of 132 kV, may be required to transport electricity from the solar array substation to the grid substation and will traverse the solar array areas. The exact route of the transmission lines within the solar array areas has not yet been determined and will be dependent on the final location selected for the solar array substation (should it be required).

A.3.2 Solar array substations

As noted in Section B.1, a solar array substation may be required in the central array to step the MV up to HV. Two parcels of land that form part of Lot 8 of DP 173619 are currently under consideration for the placement of the solar array substation within the central array. The indicative locations for the solar array substation are provided in Figure A.1. A larger footprint than what will likely be required has been provided at each location to allow for flexibility for placement of this infrastructure during the detailed design stage of the project (should it be required). Subject to detailed design, PV modules and ancillary infrastructure may also be placed within the substation/BESS footprints identified on Figure A.1.

A.3.3 Collector network and grid substation

As part of the ongoing detailed design of the infrastructure layout within the development footprint, it may be necessary to utilise either underground or overhead cabling (or a combination of the two) to connect the two array areas. Use of overhead 33 kV conductors to connect the central array to the grid substation will remove the need for intermediate transformation at the central array. Overhead conductors are more cost effective and experience less electrical losses due to the cooling effect of the air as well as involving less surface disturbance.

Indicative alignments for each of the electrical cabling corridors that may extend between the northern and central array areas are presented in Figure A.1. The exact route of the electrical cabling within the two solar array areas has not yet been determined so this is not shown in the figure. This will be determined during the detailed design stage of the project.

If overhead transmission lines are utilised, the design, height and style of the structures required to support them will be determined during the detailed design stage of the project; however, it is unlikely that the height of the structures will exceed 45 m consistent with Australian standards. Based on preliminary designs, single concrete, wood, or steel poles are anticipated rather than steel lattice towers. The easement required for the overhead transmission lines would be dependent on the type of structure selected but is likely to be approximately 45 m in width. The distance between each structure would also be dependent on the type of structure selected. Where possible, structures would avoid identified constraints on the land parcels between the two array areas. Complete clearance of vegetation within each of the proposed easements may be required.

The grid substation will be adjacent to TransGrid's 330 kV transmission line, which traverses the northern and central array areas (Figure A.1). At the grid substation, the electricity generated by the two solar arrays will be stepped up to 330 kV and injected into the electricity grid via an existing TransGrid 330 kV transmission line. The grid substation will be within the indicative area of 10 ha that is shown on Figure A.1 and will require a pad area of approximately 4 ha. The indicative area provided on Figure A.1 covers part of the following lots:

- Lot B of DP 172594;
- Lot 83 of DP 755814; and
- Lot 84 of DP 755814.

The exact dimensions of the grid substation will be refined during the detailed design stage of the project and in consultation with TransGrid. The exact location of the grid substation will be confirmed prior to the commencement of construction.

The land on which the grid substation is constructed is likely to require subdivision as this is a typical requirement of TransGrid, the likely owner/operator of the cut-in section of the yard. At the end of the operational life of the grid substation, the infrastructure on the subdivided lot will be decommissioned and the lot will be reconsolidated back into the residual lot.

All land surrounding the development footprint is zoned RU1 Primary Production under the Uralla LEP, with associated minimum lot sizes of 200 ha. The subdivision of the lot(s) that are selected for the grid substation may result in a lot size that is less than the minimum lot size under the Uralla LEP. Notwithstanding, in accordance with the provisions of Section 4.38 of the EP&A Act, the proposed subdivision will be permissible subject to the approval of the Minister for Planning or their delegate. The proposed subdivision will be the subject of ongoing discussion with Uralla Shire Council, DPE and the project landholders.

A.3.4 Battery and energy storage system

The purpose of the BESS will be to support the network, introduce a dispatchable capability to the project's energy generation profile and allow for revenue diversification.

The BESS will be adjacent to one or more substations within the development footprint and will be housed within either a number of small enclosures/cabinets or larger battery buildings. The specific design details for the BESS and their respective enclosure types have not been confirmed; however, it is anticipated that the BESS for the project will consist of either one BESS facility at the grid substation or two BESS facilities (ie one at the grid substation and one at the internal solar array substation, should one be needed at the central array).

The small enclosures will likely be either modified shipping containers, pre-fabricated switch room structures or smaller outdoor rated cabinets. The modified shipping containers and prefabricated switch rooms will likely be mounted on concrete footings, while the cabinets will be mounted on several concrete slabs. The large buildings will be similar in appearance and construction to agricultural sheds prevalent across the project boundary.

Based on an indicative design, it is anticipated that the height of the battery enclosures/cabinets will be approximately 3.8 m, whilst the height of the dedicated use buildings will be approximately 7.5 m. These dimensions should be considered indicative only. Exact dimensions will be refined during the detailed design stage of the project. Each of the footprints presented on Figure A.1 provide adequate flexibility for design and siting of the applicable BESS at each location.

The major components for each BESS include:

- Batteries – the specific battery module manufacturer and model has not been selected; however, it will likely be a type of lithium ion battery similar to the LG Chem Lithium Nickel Manganese Cobalt Oxide (NMC) 2-hour energy module or Tesla Powerpack 2 hour solution.

- Inverters – the inverters will likely be similar to those used within the array areas as part of the PCUs. An alternative arrangement may be required whereby the inverters would be positioned adjacent to the battery cabinets, with the transformers and switchgear separate to this.

- Transformers – within the BESSs, there will be two types of transformer, namely a LV to MV transformer and a MV to HV transformer. The configuration of the transformers will be subject to the type of batteries used and the BESS configuration.

- Heating ventilation air conditioning (HVACs) – one of three types of HVAC will likely be used as part of the BESS to maintain the batteries at a temperature that will optimise their lifetime and performance. This includes small package units; large chillers or a liquid cooling system (should the battery cabinet configuration be installed).

- Fire protection – the shipping container/pre-fabricated switch room structures and large building BESS configurations will have active gas-based fire protection systems. Within each of the potential enclosures, there will be thermal sensors and smoke/gas detectors connected to a fire control panel. Note that the Tesla cabinet facilities would not have this feature as the inherent design minimises risk of a fire spreading from one cabinet to another.

The components described above will be similar for each of the BESS structures likely to be constructed as part of the project. As noted above, the specific design details for the BESS have not been confirmed and will not be known until the completion of the detailed design stage of the project.

A.3.5 Supporting infrastructure

In addition to the infrastructure described above, the project will also require:

- one or more O&M buildings (namely meeting facilities, a temperature-controlled spare parts storage facility, SCADA facilities, a workshop and associated infrastructure);

- a number of new internal roads to enable access to the array areas from Big Ridge Road (Figure A.1);

- emergency access points to enable access to the array areas from the surrounding road network in the case of an emergency (eg fire or flood);

- parking and internal access roads/tracks within the array areas to allow for construction and ongoing maintenance; and

- fencing and landscaping around the solar arrays, substations and BESSs.

O&M buildings and associated infrastructure will likely be constructed within the footprints nominated for the substations and BESSs; however, their exact location will be determined during detailed design (Figure A.1). The locations for the emergency access points will be identified as part of the project's emergency response plan (ERP) during detailed design.

Temporary infrastructure during the construction stage of the project including laydown and storage areas and a site compound are also likely to be required in each of the solar array areas. Laydown areas will likely be in close proximity to the primary site access points and will be placed away from environmentally sensitive areas, where possible. Indicative locations for laydown areas and site compounds within each of the array areas are provided on Figure A.1.

Chain-link (or mesh) security fencing will be installed within the project boundary to a height of up to 2.4 m high. The specific location of the security fencing will be determined in consultation with the contractors selected for the construction of the project and project landholders. Fencing will restrict public access to the development footprint. Where possible, fencing will be positioned to minimise disruption to ongoing agricultural operations on land adjacent to the development footprint.

A.4 Construction

A.4.1 Site preparation

The need for heavy civil works such as grading/levelling and compaction will be minimised as much as practicable, as the flattest land areas within the array areas, which are already mostly cleared of vegetation, have been selected. Civil works will be required to prepare the array areas, which includes installing fencing, internal access tracks, and minor earth works (such as for installation of underground electrical cabling). It is anticipated that some cutting and filling may be required in undulating areas within the development footprint; however, this will be avoided where practicable.

Some heavier earth moving will likely be required for certain project infrastructure (eg substations and BESSs) in those instances where a level pad is necessary. In addition, grading around lower order streams and drainage channels within the three array areas may also be required in order to manage erosion during construction.

As part of site establishment works, management measures will be implemented to mitigate potential impacts on the environment and receptors within close proximity of the development footprint. Where required, additional or improved drainage channels, sediment control ponds and dust control measures will be implemented. Further, laydown areas and waste handling, fuel and chemical storage areas will be strategically placed to minimise potential environmental impacts during the construction stage of the project.

Site establishment works and preparation for construction may include:

- the establishment of a temporary construction site compound in a fenced-off area within the development footprint including:
    - a site office;
    - containers for storage;
    - workshops;
    - parking areas; and
    - temporary laydown areas;

- construction of access tracks and installation of boundary fencing;
- site survey to confirm infrastructure positioning and placement; and
- ongoing geotechnical investigations to confirm the ground conditions.

A.4.2 Construction activities

Upon completion of the site establishment and pre-construction activities described above, construction activities will typically be rolled out as follows:

- drive or screw piles;
- install mounting structures and tracker tubes;
- secure PV modules to tracker tubes;
- installation of DC cabling, MV and HV cables (either underground or overhead);
- installation of PCUs;
- complete substation augmentation;
- establishment of the BESS compound; and
- test and commission project infrastructure.

A.4.3 Construction plant and equipment

The plant and equipment required for the construction of the project will include:

- earthmoving machinery and equipment for site preparation;
- cable trenching and laying equipment;
- pile-driving equipment;
- assisted material handling equipment (forklifts and cranes);
- machinery and equipment for connection infrastructure establishment and installation of battery and energy storage devices; and
- water trucks for dust suppression.

A.4.4 Delivery of construction materials and infrastructure

Construction materials and infrastructure may be transported to the array areas via road. Heavy vehicles up to 26 m in length will require access to the array areas. Construction materials and infrastructure delivered to the array areas will include:

- PV modules;
- piles;
- tracking tubes and associated tracker equipment (eg motors, bearings, drivetrains, etc);

- electrical infrastructure including cabling and PCUs;
- construction and permanent O&M buildings and associated infrastructure; and
- earthworks and lifting machinery and equipment.

Over-dimensional vehicle movements should be limited to a total of 30 vehicles to enable the transport of:

- 33 kV/132 kV transformers (if required);
- 33 kV/132 kV/330 kV transformers;
- replacements of damaged or failed transformers, significant components and related equipment;
- BESS components;
- civil works plant, components and related equipment; and
- replacements of large indivisible items during operations and decommissioning (if required).

The maximum estimated length of the over-dimensional vehicles is estimated to be up to 120 m. Decommissioning will require the same number of over-dimensional vehicles. No over-dimensional vehicle movements are anticipated during operations.

As part of ongoing design, ACEN Australia has also been considering the potential use of the Main Northern Railway line for delivery of construction materials and project infrastructure. The use of the Main Northern Railway line for deliveries to the northern array area has been the subject of consultation with John Holland Country Regional Network (JHR), Transport for NSW (TfNSW) and DPE. Additional information in relation to this activity is provided below. It should be noted that the final decision by ACEN Australia on whether the Main Northern Railway line will be used for delivery of construction materials and infrastructure will depend on a number of factors, including:

- timing and logistics;
- sequencing of works;
- cost and safety considerations; and
- engineering, procurement and construction (EPC) contractor acceptance of this alternative to using the road network.

i Location of train unloading and associated works

The proposed location of the train unloading includes works within:

- Part of Lot 221 of DP 755814 (within the development footprint for the northern array area) – this area will be used as a temporary laydown area during construction, primarily for the short-term storage of shipping containers (or similar).
- Part of Lot 2 of DP 982376 (outside of the development footprint within the rail corridor) – a temporary hardstand will be constructed in this area to facilitate safe and efficient use of a mobile forklift, reach stacker or similar during unloading activities.

A larger footprint than what will likely be required has been provided at each location to allow for flexibility for placement of this infrastructure during the detailed design stage of the project. The exact dimensions for the temporary hardstand will be refined during the detailed design stage of the project and in consultation with JHR and TfNSW.

ACEN Australia proposes to unload the trains using specific container unloading equipment such as a mobile forklift or reach stacker. The equipment will unload the train within the temporary hardstand area and transport the shipping containers (or similar) to the temporary laydown area within the development footprint for the northern array area. During unloading, the train will likely shunt along the track to allow for safe and efficient unloading from the full length of the temporary hardstand (approximately 100 m). This will allow ACEN Australia to unload approximately four containers with each train movement.

The existing level of the rail corridor, Main Northern Railway line and development footprint for the northern array is quite flat through the relevant area and it is anticipated that minimal ground disturbance will be required. The level crossing visible in Figure 2.3 and Photograph 2.5 (refer EIS) only services the property on which the northern array is located, subsequently, there will be no impacts on the users of the level crossing.

Construction materials and infrastructure delivered to the temporary laydown area will then be relocated to other areas within the development footprint using internal access roads.

All light and heavy vehicles that require access to the temporary laydown area (within the development footprint for the northern array area) and the temporary hardstand (adjacent to the Main Northern Railway line and within the rail corridor) will travel to these areas from the primary site access point for the northern array area (off Big Ridge Road) using the project's internal access roads. This includes heavy vehicles transporting gravel (or similar) to the two areas during site establishment works, as well as deliveries of construction plant and equipment. It is anticipated that this equipment will already be available on-site as it will be the same equipment that will be used during the construction of the project's internal access roads.

The location for an emergency access point will be identified as part of the project's emergency response plan (ERP) during detailed design.

Photograph A.3 **General condition of Lot 2 of DP 982376 at the proposed laydown area – looking south (outside of the development footprint and project boundary)**

Photograph A.4 General condition of Lot 2 of DP 982376 at the proposed laydown area – looking north (outside of the development footprint and project boundary)

The shipping containers (or similar) will likely have a height of approximately 2.9 m. The equipment proposed for use during train unloading have limited vertical reach. Subsequently, the maximum height of infrastructure within the laydown area during the unloading activities will be approximately 8.7 m.

As noted above, the containers will only be stored within the temporary laydown area on-site for a short duration, before being unloaded or transferred elsewhere within the development footprint. Once emptied, the shipping containers (or similar) will be removed off-site during subsequent train movements.

At the completion of construction, PV modules and ancillary infrastructure may be placed within the laydown area. The temporary hardstand within the rail corridor will be decommissioned and rehabilitated in consultation with JHR and TfNSW.

ii Origins, timing, frequency and duration

It is anticipated that it will take approximately 4 hours to unload each train and that an average of 2 trains per week may be used for the delivery of construction materials and infrastructure.

The trains will likely originate at Port Botany in Sydney and will need to stable in Armidale to allow for passenger services to pass. The train from Sydney to Armidale passes the northern array area at approximately 8.50 am. The return train to Sydney passes the northern array area at approximately 5.20 pm. Therefore, ACEN Australia proposes to unload the train during the day between these two train services.

As part of consultation with JHR, the potential to unload at night was discussed as this would allow a longer window between passenger trains; however, this is currently not the preferred approach as it would require the use of temporary lighting plant at both the hardstand and laydown areas.

iii Consultation and approval process

ACEN Australia has been engaging with JHR and TfNSW in relation to the proposed use of the rail line.

To allow for the development of the hardstand and unloading operations (ie activities outside of the development footprint), a licence from TfNSW is required. As noted during consultation with DPE, this is a separate approval process and will be undertaken in consultation with JHR and TfNSW.

As the agent/operator, JHR has provided an informal briefing to TfNSW to introduce the project and the proposed activities and it's been confirmed that the proposed unloading activities are operationally viable with sufficient siding resources available along the relevant sections of the Main Northern Railway line.

ACEN Australia will commence the application process directly with JHR (who handle the administrative part of the process) and TfNSW (who will be the approval authority and distribute the licence).

A.4.5 Construction staging, duration and hours

Construction of the project is still anticipated to take approximately 36 months from the commencement of site establishment works to commissioning of the two array areas. It is anticipated that the project will be constructed in two stages.

Stage 1 will include complete construction of the northern array area including the grid substation and is anticipated to take approximately 25 months to complete.

Stage 2 will include complete construction of the central array area and is anticipated to take approximately 20 months to complete. Stage 2 also includes the construction of the BESS, which is also anticipated to take approximately 20 months to complete.

Stage 2 will commence approximately 12 months after the commencement of site establishment works planned as part of Stage 1.

As noted within the EIS, the exact timing of each stage, including the commencement of Stage 1, the commencement of Stage 2, and the subsequent duration of the overlap between the two stages will be determined during the contracting, detailed design and financing stage of the project following project approval. Similarly, the overall duration of the project's construction will also be confirmed at this time once the preferred EPC contractor is selected and the detailed construction schedule is confirmed. The timeframes are indicative only and reflect a conservative upper limit of potential impacts from the project.

The construction of the additional BESS infrastructure is anticipated to extend the duration of construction. It is anticipated that the construction of the additional BESS infrastructure will be in stages and the duration will be dependent on the timing of the development of the New England REZ and associated infrastructure.

Unless the Secretary agrees otherwise, ACEN Australia will only undertake construction, upgrading or decommissioning activities on-site between:

- 7.00 am to 6.00 pm Monday to Friday;
- 8.00 am to 6.00 pm Saturdays; and
- at no time on Sundays and NSW public holidays.

The following construction, upgrading or decommissioning activities may be undertaken outside these hours without the approval of the Secretary:

- activities that are inaudible at non-project related residences;
- the delivery of materials as requested by the NSW Police Force or other authorities for safety reasons; or
- emergency work to avoid the loss of life, property and/or material harm to the environment.

Examples of inaudible activities that may be carried out on-site include, PV module installation, bracket installation, rolling out cables, testing and commissioning, surveying and waste sorting.

A.4.6 Construction workforce

The project will require a peak construction workforce of up to 700 people.

As part of Stage 1, a peak workforce of approximately 350 people may be required on-site. It is anticipated that the average construction workforce throughout the 25 month construction period for Stage 1 will be approximately 180 people.

As part of Stage 2, a peak workforce of approximately 650 people may be required on-site. It is anticipated that the average construction workforce throughout the 20-month construction period for Stage 2 will be approximately 290 people. Stage 2 includes the complete construction of the central array area, as well as the BESS.

The origins of the project's peak construction workforce may include:

- Uralla Shire LGA – approximately 10% of the project's construction workforce;
- Tamworth LGA – approximately 20% of the project's construction workforce; and
- Armidale LGA - approximately 20% of the project's construction workforce.

During construction, there will be a preference for employment of local and regional residents where they are able to demonstrate relevant skills and experience and a cultural fit with ACEN Australia and the EPC contractor.

The remaining 50% of the project's peak construction workforce are anticipated to originate from outside of these LGAs.

A.5 Commissioning

Project commissioning means the processes and works for commissioning of a section of the solar farm by the contractor prior to sectional completion. It includes the processes required to ensure the works operate satisfactorily, safely and comply with the requirements of the contract and regulatory frameworks.

Project commissioning will include physical works that generally fall under testing, inspecting, and monitoring (ie no audible activities).

A.6 Services

The project may require connections to the electricity, telecommunications, water and sewer networks. During construction, electricity requirements will be met by backup generators.

A.7 Operation

The operational lifespan of the project will be in the order of 30 years, unless the facility is re-powered at the end of the PV modules' technical life. The PV modules typically come with a performance warranty for 25 years from the manufacturer. The decision to re-power the plant will depend on the economics of solar PV technology and energy market conditions at that time. Should the PV modules be replaced during operations, the lifespan of the project may extend to up to 50 years. Throughout operations, a workforce of up to 15 FTEs will be required.

It is anticipated that the facility will require regular maintenance throughout its operational life. This will include the following ongoing tasks:

- site maintenance including:
  - vegetation maintenance;
  - weed and pest management;
  - fence and access road management;

- upgrading drainage channels; and
- landscaping;

- infrastructure maintenance including:
  - panel cleaning;
  - panel, inverter and tracker system repair (if required);
  - inverter replacement (within every 7–10 years); and
  - equipment, cabling, substation and communications system inspection and maintenance.

Regular light vehicle access will be required throughout operations. Heavy vehicles may be required occasionally for replacing larger components of project infrastructure including inverters, transformers or components of the BESS. Highly technical O&M activities will typically be undertaken by specialist subcontractors and/or equipment manufacturers whereas routine activities such as fencing maintenance and vegetation management is likely to be offered to local contractors wherever available.

ACEN Australia is currently in discussions with a number of the landholders to enable sheep grazing to resume on portions of the array areas following the completion of the construction of the project. A detailed protocol will be developed to ensure biosecurity is maintained and that grazing does not impact on the safe and efficient operation of the project or result in injury to farm workers, stock or O&M staff.

To ensure the optimal electricity production output for the project is maintained, the PV modules may need to be washed periodically to remove dirt, dust and other matter. Water for panel cleaning will be transported to the array areas via water trucks. Washing will not require any detergent or cleaning agents.

The operational workforce will also be responsible for ongoing security monitoring of the array areas and project infrastructure. Perimeter security cameras may be utilised to assist with monitoring the array areas.

A.8 Decommissioning

Once the project reaches the end of its investment and operational life, the project infrastructure will be decommissioned and the development footprint returned to its pre-existing land use, namely suitable for grazing of sheep and cattle, or another land use as agreed by the project owner and the landholder at that time.

Project decommissioning will require disturbance of the development footprint during the removal of equipment. A significant number of FTEs, including both staff and contractors, and vehicle movements will be required during the decommissioning stage of the project.

Any underground cabling below 500 mm will remain in-situ following project decommissioning.

ACEN Australia will attempt to recycle all dismantled and decommissioned infrastructure and equipment, where possible. Structures and equipment that cannot be recycled will be disposed of at an approved waste management facility.

A.9 Environmental management

An environmental management strategy (EMS) will be implemented to provide the strategic framework for environmental management of the project. The strategy will:

- incorporate a project environmental management plan (EMP), all other required plans, protocols, management and mitigation measures proposed in the EIS, AR and modification report;
- identify all relevant statutory approvals;
- establish roles, responsibility, authority and accountability of all key personnel involved in the environmental management of the project;
- establish procedures for consulting with the local community and relevant agencies about the operation and environmental performance of the development; and
- establish procedures for handling of complaints, disputes, non-compliances and emergency response.

Appendix B of this report provides a consolidated summary of the management measures that will be implemented during the construction and operation of the project to manage, mitigate and/or monitor potential impacts identified within the EIS, AR and modification reports.

Appendix B

Updated mitigation measures table

EMM
creating opportunities

Table B.1 Summary of management and mitigation measures

Key issue	Proposed management and mitigation measures
Biodiversity	A biodiversity management plan (BMP) will be prepared as part of the project's construction environmental management plan (CEMP) prior to commencement of on-site construction works and will include advice regarding the effective implementation of each of the biodiversity management and mitigation measures listed in Table 6.1 of the EIS BDAR, including: • avoid and minimise clearing impacts to PCTs, where possible; • clearing limits will be clearly marked to prevent unnecessary clearing beyond the extent of the development footprint; • appropriate signage such as 'No Go Zone' or 'Environmental Protection Area' should be installed; • identify the location of any 'No Go Zones' in site inductions; • limit removal of trees (including dead trees) to that required within the development footprint in support of the installation of project infrastructure; • a clearing procedure will be implemented during the clearing of the development footprint, as follows: – preclearance surveys will be completed to determine if any nesting birds are present; and – a suitably trained fauna handler will be present during hollow-bearing tree (including dead hollow-bearing trees) clearing to rescue and relocate displaced fauna if found on-site; • installation of appropriate exclusion fencing around trees and woodland to be retained within the development footprint whilst construction is occurring; • the radius of TPZ is calculated for each tree by multiplying its DBH by 12 in accordance with AS 4970-2009 Protection of trees on development sites; • appropriate education should be provided to site personnel in site inductions regarding the purpose of exclusion fencing or no-go zones; • speed limits within the development footprint will be limited to 40 km/hr and stated in the CEMP and OEMP; • source controls, such as mulching, matting and sediment fences, will be utilised where appropriate; • an ESC plan will be prepared in accordance with *Managing Urban Stormwater: Soils and Construction* (Landcom 2004) prior to construction; • disturbed areas will be stabilised and rehabilitated as soon as possible to reduce the exposure period; • a specific creek crossing sub-plan will be included as part of the CEMP; and • all creek crossings are to comply with the *Policy and Guidelines for Fish Friendly Waterway Crossings* (DPI 2003). The BMP will include an unexpected finds protocol for threatened species, which will include advice and photographs of key species with the potential to occur within the development footprint. The unexpected finds protocol will outline the following actions if a threatened species or suspected threatened species is found during construction or operation of the project: • stop work within the vicinity of the species; • cordon of the area in question with an appropriate buffer; • inform the management team; • seek advice from an ecologist or species expert to confirm identification; and • if a threatened species is confirmed, consult with the relevant agencies to determine appropriate management, mitigation measures and additional approvals (if required). Additional measures to avoid and minimise indirect impacts will be outlined in the CEMP and OEMP and will include: • appropriate wash down facilities will be available to clean vehicles and equipment prior to arrival and when leaving site. In particular, ensure soils and seed material isn't transferred in accordance with the measures outlined in the CEMP; and • lighting to comply with AS/NZS 4282:2019 – *Control of Obtrusive Effects of Outdoor Lighting*. Julia Gully, a third order stream in the north-east corner of Area 3, is highly ephemeral with a poorly defined channel and occasional, small shallow pools during wet periods. Nonetheless, a 30 m buffer from each edge of the channel will be maintained to minimise potential impacts on downstream water quality and erosion.

Table B.1 Summary of management and mitigation measures

Key issue	Proposed management and mitigation measures
Aboriginal cultural heritage	An Aboriginal Heritage Management Plan (AHMP) will be developed in consultation with DPE, the RAPs and HeritageNSW. It will provide details of: • all Aboriginal sites identified during the archaeological investigation for the project; • management measures and their progress towards completion; • measures to ensure ongoing consultation and involvement of project RAPs; • RAP access arrangements for a selection of significant sites for educational purposes; • protocols for newly identified sites; • protocols for educating staff and contractors of their obligations relating to Aboriginal cultural heritage values through a site induction process; • protocols for suspected human skeletal materials; • protocols for the ongoing care of salvaged Aboriginal objects within a keeping place; and • provisions for review and updates of the AHMP. The AHMP will be prepared after project approval, and in addition to the points above, will address all relevant conditions of approval. Aboriginal sites identified as part of archaeological investigations will be managed in accordance with the management strategies presented in Table 7.3 of the ACHA Addendum (refer Appendix E of the AR). Generally, sites designated for avoidance within the development footprint or within 20 m of the development footprint will be avoided with protection during the construction phase of the project to avoid inadvertent impacts. This may involve the installation of treated timber poles (or similar) painted with high visibility paint around the visible extent of the sites and/or the PAD areas prior to construction. Unless specified otherwise for individual sites, a construction buffer of at least 20 m will be applied to the demarcated boundaries of avoided sites. A suitably qualified archaeologist accompanied by a RAP representative will demarcate site locations and where the poles should be erected. A construction buffer of at least 100 m will be applied to the site boundaries of NE09 and NE68 (also meaning at least a 50 m buffer from the PAD boundary that extends beyond the physical site contents). The boundaries of these sites will also be demarcated prior to construction. A semi-permanent or permanent boundary fence will be erected around site NE09 to protect it from livestock or other accidental damage. ACEN Australia will explore opportunities to employ RAPs for vegetation, weed and pest management of NE09 after fencing is erected. The details of fencing and maintenance will be discussed as part of consultation with the RAPs during the preparation of the AHMP. All sites identified within the ETL options surveyed as part of the EIS ACHA will be avoided during detailed design. Sites that occur over 20 m from the development footprint will be passively avoided without protection. All surface artefact sites (artefact scatters and isolated finds) impacted by the project will be collected. The collection will be undertaken by qualified archaeologists and RAP representatives in accordance with the methodology provided in Section 9.2.4 of the EIS ACHA. The ACHA details the special procedures to be followed as part of the management of Aboriginal cultural heritage, including: • Aboriginal keeping place – RAPs have nominated that the recovered objects be kept at the Armidale and Region Aboriginal Cultural Centre and Keeping Place. ACEN Australia are committed to working with the RAPs to accommodate the requests for storage and curation of collected objects. It is noted that the final locations for specific objects and details of curation, storage, display and interpretation of recovered objects will be developed and resolved during consultation with the RAPs as part of the preparation of the AHMP. • RAP site access arrangements – subject to further discussion on protocols, RAP access arrangements for a selection of significant sites (including NE09 and NE68) for educational purposes will be detailed within the AHMP. • Aboriginal ancestral remains – In the event that known or suspected human remains are encountered during the project's construction, the procedure detailed in the AHMP will be followed as soon as the suspected remains are discovered.

Table B.1 Summary of management and mitigation measures

Key issue	Proposed management and mitigation measures
	• Discovery of new Aboriginal sites – in the event of discovery of new Aboriginal sites within the development footprint, the procedure detailed in the AHMP will be followed. Newly identified sites that are not at risk of impact (ie over 50 m from the approved development footprint) will be avoided through passive protection. In the event that newly identified sites will be impacted by the construction of the project and cannot be avoided, they will be managed in a manner commensurate with their assessed significance. The felled and sawn in half Aboriginal scar tree, NE49, will be salvaged prior to project construction and placed in an Aboriginal keeping place as discussed in Section 9.3.1 of the EIS ACHA. The project's AHMP will detail the methods for salvage, curation and presentation of the tree. The 13 standing Aboriginal scar trees discussed in the ACHA amendment report will be avoided and will receive the same general avoidance methods as described in in Section 9.2.3 of the EIS ACHA. However, they may require additional management to address their long-term preservation given that most examples are on highly deteriorated trees. The project's AHMP will detail long-term preservation options for the trees in consultation with RAPs, the project archaeologist and HeritageNSW. The duration of ACEN Australia's management commitments for the trees would be limited to the estimated 25–30 years of the project's operation prior to decommissioning. Note that Aboriginal scar tree NE35 is no longer within the development footprint and therefore ACEN Australia will not employ long-term preservation measures for this site.

Table B.1 Summary of management and mitigation measures

Key issue	Proposed management and mitigation measures
Historic heritage	Following project approval and prior to any work commencing, a historic heritage management plan (HHMP) will be prepared to guide the conservation of heritage items, unexpected finds and human remains including skeletal material, for the duration of the project. The relevant measures in the HHMP will be incorporated into the project CEMP and OEMP to avoid accidental impacts during the construction and operation of the project. The HHMP will include the management measures in this document and identify the minimum locations for photographic archival recording. Where construction and operation activities are within 10 m of identified items with heritage values, all efforts will be made to avoid impacts; this includes active protection of items through the use of high visibility rope, flags or sturdy bollards and total exclusion zones for construction activities and placement of infrastructure. If moveable heritage is found in the development footprint during project construction it will be protected by re-locating it to another area of the property in consultation with the landholder. Moveable heritage includes items such as farm machinery and water tanks and stands. Details on identification and actions will be included in the HHMP. Prior to any changes to the landscape and specific heritage items that may result from project activities, a digital photographic archival record will be prepared. The digital photographic record will be prepared in accordance with the Heritage Manual guidelines, *Photographic Recording Of Heritage Items Using Film or Digital Capture* (Heritage Office 2006). The discovery of human remains including skeletal material will halt work in a 10 m radius and the remains will not be tampered with. Personnel with the appropriate level of authority will contact the police and the coroner for investigation, which may include the involvement of OEH and advice from a physical anthropologist. A detailed protocol will be developed for the HHMP. Tree line wind breaks will be retained where practicable (for example, where they are located to the south of PV module rows, so that they do not create shading issues). An unanticipated finds protocol will be refined in the HHMP to provide guidance to construction personnel should works uncover objects and fabric that may indicate relics. Work will stop if objects such as bonded bricks, timber or stones appearing in formation indicating a wall or floor for instance are found, or if soil with artefacts concentrations, is excavated. A detailed materiality threshold will be determined prior to construction as part of the HHMP and staff involved in excavation work will be informed about how to apply it. The unanticipated finds protocol will include actions such as: • if the find meets the materiality threshold defined in the HHMP, work will immediately but temporarily cease within 5 m of the find and the site supervisor or appropriate responsible person will be informed; • 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; and • if the find is assessed and is not a relic, work inside the area that was made a no-go area can re-commence. Appropriate management measures range from do nothing to archaeological excavation.

Table B.1 Summary of management and mitigation measures

Key issue	Proposed management and mitigation measures
Land	As part of the CEMP, a soil and water management plan (SWMP) will be prepared prior to commencement of on-site construction works in consultation with Uralla Shire Council and DPE Water as required and will incorporate all soil and water related commitments outlined this table. The SWMP will provide detailed background information, erosion hazards assessments including erosion hazard mapping and soil loss calculations for all disturbed areas, overall draining, erosion and sediment control approach, design standards and management strategies and approach for progressive rehabilitation and stabilisation of disturbed land. The SWMP will set out the framework for preparation and implementation of an erosion and sediment control plan (ESCP), which will be prepared in accordance with *Managing Urban Stormwater: Soils and Construction* (Landcom 2004) and will include: • a set of progressive erosion and sediment control plans (ESCPs) for each section of the construction site. Where particular sensitivities or erosion risks are identified, ESCPs may be used in conjunction with site or activity specific ESCPs or similar to provide more detailed site-specific mitigation measures; • erosion and sediment controls (ESCs) will be installed, with priority given to sloped areas and areas adjacent to drainage lines; • all construction and operational activities will be planned and carried out to ensure that damage to soil and vegetation outside the area designated for clearing (ie the development footprint) is minimised; • where practicable, consideration will be given to the timing of disturbance and vegetation clearing ahead of project activities to ensure disturbed areas are exposed for the shortest possible time; • where practicable, ACEN Australia will minimise the disturbance of soils (especially subsoil) or stockpiles at times immediately following significant rainfall events (eg 25 mm in 24 hours); • disturbed areas will be stabilised and progressively rehabilitated as quickly as possible; and • ameliorants (such as gypsum and fertiliser) will be applied at recommended rates during construction and as part of decommissioning and rehabilitation activities (in consultation with project landholders) and will assist with erosion management. Where temporary crossings of watercourses are necessary to provide construction access over these features, temporary stabilised crossings may be utilised. The project's CEMP and OEMP will include weed management protocols, such as measures for the identification, management and ongoing monitoring of weeds on-site. If pest control is considered necessary, it will generally involve a routine baiting program in consultation with the project landholders and neighbouring landholders. Other control methods such as shooting or trapping may also be used if deemed necessary or appropriate. A project decommissioning and rehabilitation plan will be prepared prior to the end of the project's operational life and will feature rehabilitation objectives and strategies for returning the development footprint to agricultural production or alternative uses as has been agreed with the project landholders. As part of the decommissioning and rehabilitation, ACEN Australia would remove any underground cabling within 0–500 mm of the ground surface, and will attempt to reuse, resell or recycle all dismantled and decommissioned infrastructure and equipment, where possible. Structures and equipment that cannot be reused or recycled will be disposed of at an approved waste management facility. The CEMP will incorporate the following measure to address concerns raised by surrounding landholders in relation to security during construction: • a zero tolerance policy on theft will be implemented on-site throughout the project's construction period; • criminal background checks on all staff, contractors, sub-trades and security guards will be performed; • surrounding landholders, project landholders and law enforcement will be provided with the primary contractor's contact information; • surveillance cameras and signs will be implemented to deter vandalism and theft; • the temporary construction site compound will be established in a fenced-off area within the development footprint; and • chain mesh security fencing will be installed within the project boundary around the perimeter of the array areas to control access.

Table B.1 Summary of management and mitigation measures

Key issue	Proposed management and mitigation measures
Visual	Landscaping to mitigate views of project infrastructure at Viewpoint 5 will be considered in consultation with the property owner of N1. Where possible, suitable colours will be chosen for project infrastructure to minimise visual impacts. Buildings and materials will be designed to blend in with the local rural/farming landscape and will not be dissimilar to existing farm sheds and agricultural infrastructure in the area surrounding the two arrays. All external lighting will be installed as low intensity lighting (except where required for safety or emergency purposes) and will comply with AS/NZS 4282:2019 – *Control of Obtrusive Effects of Outdoor Lighting*.
Noise	The following measures are recommended to be implemented during construction works with the aim of minimising impacts and reducing construction noise levels below the relevant goals: • a letter box drop for residences in close proximity of the proposed works to inform residents of planned construction activities, time periods and expected durations, potential impacts and proposed mitigation measures; • minimise the number of plant items operating concurrently when in close proximity to surrounding receivers; • planning deliveries and access to occur quietly and efficiently and organising parking only within designated areas away from nearby receivers (where possible); and • appropriate respite periods to be implemented after high noise and vibration-generating activities are carried out in continuous blocks. Universal works practices during construction will include: • regular reinforcement (such as at toolbox talks) of the need to minimise noise and vibration; • regular identification of noisy activities and adoption of improvement techniques; • developing locations for parking of vehicles to minimise noise; • minimising the movement of materials and plant and unnecessary metal-on-metal contact; • minimising truck movements; and • scheduling respite periods for intensive works including consultation with potentially affected neighbours. Additional measures for plant and equipment will include: • choosing quieter plant and equipment based on the optimal power and size to most efficiently perform the required tasks; • operating plant and equipment in the quietest and most efficient manner; and • regularly inspecting and maintaining plant and equipment to minimise noise and vibration level increases and to ensure that all noise and vibration reduction devices are operating effectively. Additional measures for work scheduling include: • scheduling high noise-generating work to coincide with less sensitive periods, where possible (for example, where residents in close proximity could be expected to be at work); • undertaking risk assessment of potential noise impacts on surrounding residential receivers if plant and equipment quantities are proposed to vary significantly from those assumed in Table 6.1 of Appendix J of the EIS; and • optimising the number of deliveries to site by amalgamating loads where possible. A 600 m buffer (ie work exclusion area) will be maintained around N1 during daytime out-of-hours construction works (ie 1.00 pm to 6.00 pm Saturday afternoons).

Table B.1 Summary of management and mitigation measures

Key issue	Proposed management and mitigation measures
Transport	A TMP and Driver Code of Conduct will be prepared prior to commencement of on-site construction works and in consultation with Uralla Shire Council and TfNSW. The TMP will include the following requirements: • a dilapidation survey to be conducted to assess condition of the proposed vehicle routes; • concept designs for recommended intersection improvement works for the following intersections, including assessment of sight distances, swept path analysis and access treatment arrangements; • New England Highway/Barleyfields Road (primarily for vehicles turning right onto Barleyfields Road); • Barleyfields Road/Big Ridge Road; • details of traffic management treatments and traffic control plans (TCPs) as required, which will include consideration of regulatory signs and devices that require endorsement of the Local Traffic Committee and Council approval; • consideration of measures to limit the impact on school bus routes and safety initiatives for transport through residential areas and/or school zones, which will include avoidance of peak hour and school bus times for the project's construction material deliveries and other heavy vehicle movements, whenever possible; • a map of the primary access routes highlighting critical locations; • the framework for handling/approval of exceptions (for emergency or other unforeseen circumstances) to the exclusion of heavy vehicles utilising the Barleyfields Road (south) intersection via Wood Street to access Big Ridge Road during construction of the array areas; • safety initiatives for transport through residential areas and/or school zones; • consideration for coordination of construction traffic with seasonal agricultural haulage; • an induction process for vehicle operators and regular toolbox meetings; • a complaint resolution and disciplinary procedure; and • community consultation measures for the peak construction period. Potential seasonal/campaign-based agricultural transport activities will be identified during further consultation with project landholders and nearby landholders and any required mitigation measures (eg temporary alternate construction vehicle access routes and/or revisions to construction scheduling) will be identified in consultation with landholders and included in the TMP. Potential stock crossing locations will be identified through further consultation with project-related and nearby landholders and any required mitigation measures (eg direct line of communications between landholder and site construction manager and/or temporary traffic control at stock movement locations) will be identified in consultation with landholders and included in the TMP. ACEN Australia is also mindful of the safety of drivers at level crossings in the Uralla Shire LGA and, subsequently, additional TfNSW tips and safety guidelines will be included in the Driver Code of Conduct as part of the TMP. Temporary traffic control will be considered at the level crossing at Barleyfields Road (north) during peak construction and reference to this level crossing will be included in driver inductions and the Driver Code of Conduct. Access to the rail corridor is not anticipated as required and would only be undertaken in accordance with the written permission of TfNSW. In addition to the identified primary site access points, emergency access points may be required and will be identified as part the project's ERP in consultation with JHR and TfNSW. Temporary traffic control arrangements may be required at the proposed primary access intersections during the peak stages of construction traffic activity and/or on days when deliveries by over-dimensional vehicles are required for the delivery of larger construction items such as transformers. These will be delivered under permit and in consultation with TfNSW and Uralla Shire Council.

Table B.1 Summary of management and mitigation measures

Key issue	Proposed management and mitigation measures
	The following road and intersection improvement works, which will be confirmed in consultation with TfNSW and Uralla Shire Council, are proposed to maintain the safety of the road network and to accommodate the swept paths of the largest trucks that are proposed to require access to the array areas: • New England Highway/Barleyfields Road (north) requires left and right turn traffic lanes (CHR/CHL), particularly during periods of peak construction activity; and • Consider implementation of temporary traffic control at the Barleyfields Road level crossing, particularly during the peak construction period. ACEN Australia will be required to lodge a Section 138 Certificate (Work on Public Lands) for approval before any future road work for intersection improvements can be carried out. Consideration will be given to temporary travel speed reduction and regular watering of the unsealed section of Big Ridge Road. ACEN Australia may consider speed limits, dust suppression with water spraying or localised treatment of the road with dust suppression polymers adjacent to residential properties along this road. During construction, a road maintenance program will be implemented for the affected local roads near the development footprint for the array areas. The program will be based around bi-monthly route inspections of all the affected roads and may include items such as: • regrading of the road surface to repair potholes and road corrugations at regular intervals and in response to identified serviceability and safety concerns; and • a commitment by ACEN Australia to restore the road surfaces to their pre-construction condition at the completion of construction. The road maintenance program will be prepared in consultation with Uralla Shire Council and its effectiveness will be reviewed during the construction period. The CEMP and OEMP to be prepared for the project will be prepared in consultation with TfNSW (or its agent) to ensure that any potential impacts or risks on the rail corridor during construction, operation or decommissioning are identified and appropriate mitigation measures put in place to adequately manage the identified risks. Boundary fences within the northern array area adjacent to the rail corridor will be installed and remain installed during construction and operation of the facility in accordance with John Holland Rails (JHR's) engineering standards, and suitable protection arrangements will be put in place for construction of the boundary fence adjacent to the rail corridor. Any requirement for work access to the rail corridor would only be undertaken following assessment and endorsement by JHR for the proposed access and would be undertaken in accordance with the relevant JHR rules and procedures. Prior to commencement of on-site construction work, ACEN Australia will consult with TfNSW to confirm requirements for further assessment of the Barleyfields Road active level crossing in consideration of the Australian Level Crossing Assessment Model. Monthly dilapidation surveys of Barleyfields Road (north) and Big Ridge Road will also be completed to monitor for any road degradation during construction (as a result of the proposed heavy vehicle increase) and road repair works will be completed as required.

Table B.1 Summary of management and mitigation measures

Key issue	Proposed management and mitigation measures
Water	Watercourse crossing plans consistent with NOW (2012b) and DPI (2003) detailing the design of proposed crossings of any higher order stream (ie 3rd order and above) will be prepared in consultation with DPE Water prior to commencement of construction. Placement of PV modules and ancillary infrastructure (ie footings and pilings) within 1st and 2nd order streams will be minimised to the extent practicable. Watercourse crossings of 1st and 2nd order streams for internal access tracks and electrical cabling will be minimised to the extent practicable. Implementation of ESC measures in accordance with Landcom (2004). Proposed measures will be considered further and formalised as part of detailed design and documented in the CEMP. Progressive revegetation or stabilisation of disturbed areas to minimise exposed soils to the extent possible. Implementation of procedures for hazardous material storage and spill management to be prepared and documented within the CEMP. Construction site planning to consider flood risk and locate temporary site works, compounds, storage areas and plant/equipment away from flood prone areas where practicable. Detailed design and placement of key project infrastructure (eg substations and BESSs) will consider location-specific flood levels when setting floor levels and flood protection levels and will avoid flood prone areas where practicable. Water contained within existing farm dams to be removed will be used for non-potable construction purposes, in accordance with harvestable rights provisions, to minimise use of imported water where practicable. Appropriate potable water supply will be identified in the CEMP in consultation with NSW Health and will satisfy the requirements of the NSW *Public Health Act 2010*. Monitoring of watercourse and vegetated riparian zone (VRZ) condition for all retained watercourses (that meet the definition of 'waterfront' land in accordance with the NSW *Water Management Act 2000*) where these run through or immediately adjacent to the development footprint will be undertaken, with maintenance undertaken as required to minimise scouring and erosion and ensure waterway health and stability. Monitoring and maintenance of ground cover vegetation and other stabilised surfaces throughout operation to limit erosion and transport of sediment to watercourses. Implementation of procedures for hazardous material storage and spill management to be prepared and documented within the OEMP.

Table B.1 Summary of management and mitigation measures

Key issue	Proposed management and mitigation measures
Hazards and risks	An emergency response plan (ERP) will be prepared for the project and will incorporate all relevant safety procedures and normative management recommendations detailed in the relevant acts, regulations and Australian Standards. The ERP will be prepared to address Fire & Rescue NSW recommendations and as a minimum (but not necessarily limited to) will: • include the requirements for pre-bushfire season and continual fire awareness of staff and contractors; • include the requirements for immediate notification to the local RFS and FRNSW of accidental ignition of surrounding grassland; • include the mechanisms for notification of neighbouring landholders and the community more generally of accidental ignition of surrounding grassland leading to bushfire that may impact upon them; • detail the appropriate risk control measures that would need to be implemented in order to safely mitigate potential risks to the health and safety of fire fighters and other first responders; • detail measures including the PPE required to be worn, the minimum level of respiratory protection required, minimum evacuation zone distances and a safe method of shutting down and isolating the PV system (either in its entirety or partially, as determined by risk assessment); • identify the circumstances under which different evacuation types are to be implemented, in response to a bushfire or fire emergency; • include a mechanism for the early relocation of staff in the event of a bushfire in the locality; • contain detailed plans of all Emergency Assembly Areas including 'on-site' and 'off-site' arrangements; • include requirements for appropriate on-site refuge area signage and communications; • contain details of infrastructure layout within the two array areas that show all relevant information (ie access points, fences, locked gates, water supply, areas of electrical hazard); • include transportation arrangements (eg number of vehicles required), designated assembly points and time required to have transportation available; • identify the specific structure and role of emergency control on-site (eg fire wardens); • include the requirements for training in preparation for response to an emergency; • include the requirements for clarifying a safe egress route and an understanding of the extent/spread of local fires before allowing the evacuating persons to leave the site; • include the requirements for egress and communication in the scenario that persons are leaving the project as emergency services are attending; • include details on appropriate egress routes from the different array areas; • consider emergency access/egress arrangements in the scenario that a fully loaded fire fighting vehicle cannot cross the proposed creek crossings proposed for access into parts of the two array areas; • include mechanisms for communication with RFS, FRNSW and neighbouring communities on suitable egress routes and an understanding of the impacts that the egress of high numbers of project staff may have on the local road network and the local community's ability to safely egress from the locality; and • two copies of the ERP are to be stored in a prominent 'Emergency Information Cabinet' which is in a position directly adjacent to each of the main entry points for the two array areas. The hazards and risks assessment prepared by Sherpa Consulting for the EIS also provides recommendations that should be considered during preparation of the ERP. Where applicable, the ERP should be developed to be consistent with the requirements and approach of: • *A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan* (RFS 2014); and • AS 3745-2010 *Planning for emergencies in facilities*. The additional substation/BESS infrastructure will be within a secure area with fencing and cameras and warning signs will be provided. On-site security protocols will also be developed.

Table B.1 Summary of management and mitigation measures

Key issue	Proposed management and mitigation measures
	As part of detailed design and construction of the additional BESS infrastructure, ACEN Australia will ensure that: • BESS units are certified to UL 9540A and installed in accordance with the manufacturer's instructions for best practice to mitigate fire propagation; • manufacturers provide a deflagration hazard study in accordance with UL 9540 or include explosion control measures such as passive safe ventilation of flammable gases under pressure; • a minimum one-hour fire rating is achieved for a containerised BESS; • investigation reports on the Victorian Big Battery Fire are reviewed and relevant findings are implemented; and • for indoor BESS infrastructure installed within a purpose-built structure, the following will be considered: – compartmentalisation; – occupancy and means of egress; – fire barriers; – exhaust and ventilation system; – sprinkler system and required water volume; – containment system for the expected fire protection system discharge; and – requirements of the National Construction Code and relevant Australian standards and codes (eg fire rating of materials and fire detection systems).
Bushfire	A minimum 10 m defendable space should be provided around the perimeter of each solar array area and around substations, BESSs and O&M infrastructure that permits unobstructed fire vehicle access and is maintained to the standard of an IPA. This will be in the form of mown or grazed grass or similar suitable ground cover. As a guide, grass within an IPA should be kept to no more than 100 mm in height, with leaves and vegetation debris removed (RFS 2018). The fuel load within the development footprint will be monitored and mechanically slashed, sprayed or grazed in liaison with project landholders to reduce the risk of grass fires starting within the development footprint and ensure that fires originating from outside the development footprint do not intensify as a consequence of entering the development footprint. The primary site access points will be from Big Ridge Road. Emergency access points may also be required and will be identified as part of the project's ERP in consultation with relevant agencies, including Fire & Rescue NSW and TfNSW/JHR. The primary site access points, emergency access points and project roads will comprise of a combination of sealed and unsealed roads, detailed design of which will consider: • minimum carriageway width of 4 m; • the capacity for fire fighting vehicles to pass by; • avoiding grades greater than 15 degrees (°) if sealed and 10° if unsealed; • minimum vertical clearance of 4 m to any overhanging obstructions, including tree branches; • will not have a cross fall of more than 10°; • the capacity to carry a fully loaded fire fighting vehicle (which may be up to 28 tonne); • appropriate drainage and erosion controls; and • all weather access is provided. A Fire Management Plan (FMP) will be developed in consultation with the New England Fire Control Centre. The FMP for the project will detail the specifications and maintenance of dedicated fire water sources to assist in fire suppression, as well as the appropriate vegetation management procedures (in relation to the ETL corridors) to prevent fires igniting during the construction, operation and decommissioning of the project. The FMP for the project will include the provisions for diesel generators and associated fuel storage tanks to be designed, housed and maintained so as not serve as an unacceptable risk to surrounding grassland and the provisions for specific measures and procedures to prevent ignition of grassland from hot works or from vehicles driving over long grass. Each building will have fully compliant fire safety systems. In addition, they will be constructed and routinely serviced to comply with the specific requirements, as relevant to each building.

Table B.1 Summary of management and mitigation measures

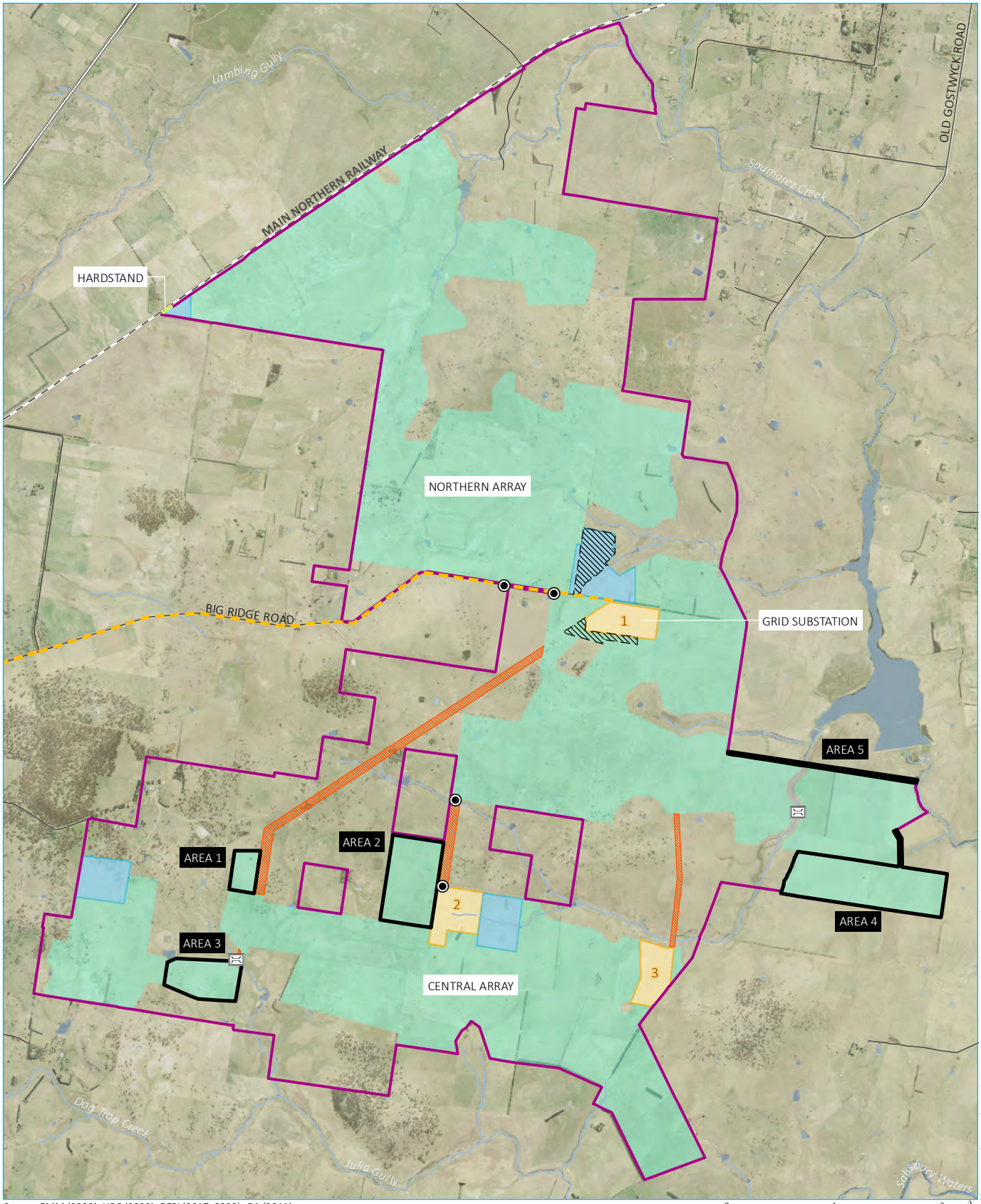
Key issue	Proposed management and mitigation measures
	Specific management actions will be undertaken to ensure suitable bushfire preparedness is undertaken as part of the project and ahead of the bushfire season, as well as specific procedures to limit the risk of ignition of surrounding grassland resulting from the project, including: • maintenance of buildings, roads, fuel levels and water supply; • appropriate work procedures, so as to limit the potential of ignition of surrounding grassland; • monitoring and review of the FMP to maintain its effectiveness; and maintenance of fire awareness through inductions, briefings, pre bushfire season drills, formal meetings, standard operating procedures and ongoing monitoring.
Social	Shuttle bus services, operated by or on behalf of ACEN Australia, between the array areas and Uralla, and between Uralla and other centres for worker accommodation such as Armidale and Tamworth may be provided for the construction workforce subject to demand. ACEN Australia proposes to procure goods and services, as far as possible, from local businesses. A publicly accessible feedback system will be created, utilising a website facility and telephone hotline, for any feedback, positive or negative, to be registered. This will be supported by a policy and mechanism by which any legitimate grievance can be investigated and resolved. A construction workforce management plan (CWMP), or similar, will be prepared, which will likely include (but not be limited to): • local workforce numbers and locations; • transient workforce accommodation locations; • consultation mechanisms with Uralla Shire Council, Armidale Regional Council and Tamworth Regional Council to avert pressure on local resources and ensure a reasonable approach to planning transient worker housing; • consultation frameworks with local providers to ensure fairness, open communication and forward planning, and grievance mechanisms; • plans for medical and other needs to ensure appropriate spread of workforce needs across all local resources and to avoid heavy pressure on a small number of local GPs; • a Code of Conduct for the project's workers (particularly to avoid anti-social behaviour at peak construction times); and • how the CWMP will be managed and audited.
Economic	Employment of regional residents preferentially where they have the required skills and experience and are able to demonstrate a cultural fit with the organisation. Participating, as appropriate, in business group meetings, events or programs in the regional community. Locally source non-labour inputs to production where local producers can be cost and quality competitive, to support local industries.
Air quality	Water trucks will be used during construction for dust suppression along internal, unsealed access roads and disturbed areas. Vehicle movements will be minimised where possible. All vehicles, plant and equipment will be cleaned and washed regularly. All vehicles, plant and equipment will be regularly inspected and maintained to ensure that they are operating efficiently. Regular maintenance of unsealed access roads will be undertaken to minimise wheel generated dust. Dust suppression requirements during construction will take into consideration weather and the likelihood of extended dry periods which could exacerbate impacts.

Table B.1 Summary of management and mitigation measures

Key issue	Proposed management and mitigation measures
Waste management	All waste will be managed in accordance with the NSW *Protection of the Environment Operations Act 1997*, the NSW *Waste Avoidance and Resource Recovery Act 2001* and the following hierarchy, which is listed in order of preference: • reduce waste production; • recover resources; and • dispose of waste appropriately. All wastes produced by the project will be classified, stored and handled in accordance with the *Waste Classification Guidelines – Part 1: Classifying Waste*. A detailed WMP will be prepared prior to commencement of construction in consultation with Uralla Shire Council as required. This plan will identify waste management measures to ensure that waste is effectively managed in accordance with relevant legislative requirements and guidelines, and will include consideration of the following: • measures to reduce the types and volumes of waste generated during construction; • measures to maximise reuse and recycling and reduce the volume of waste generated by the project and subsequently disposed of at licensed waste management facilities; • a breakdown of anticipated waste streams and volumes; • evidence of consultation with Uralla Shire Council, neighbouring councils and licensed waste management facilities to confirm the capacity of nearby facilities, their availability to accept/manage the project's waste, along with any requirements (including waste separation requirements or comingling limitations for example); • on-site waste management measures in line with relevant guidelines; and • commitments around disposal of project assets at the completion of operations.
Cumulative impacts	Preparation of a CWMP. Development and implementation of a community engagement framework as part of the project's stakeholder engagement strategy.
Environmental management	ACEN Australia will prepare and implement an environmental management strategy (EMS) to govern the avoidance, minimisation and management of impacts during the construction and ongoing operation of the project and will be set out to ensure the responsibilities and accountabilities for environmental performance are clear. The strategy will: • incorporate project environmental management plans for both construction (CEMP) and operational (OEMP) phases, all other required plans, protocols, management and mitigation measures proposed in environmental assessment and approval documentation. This table provides a consolidated summary of the specific management measures that will be implemented for each of the key environmental aspects considered as part of the EIS, AR and subsequent modification applications as part of the EMP and its associated sub-plans; • identify all relevant statutory approvals; • establish roles, responsibility, authority and accountability of all key personnel involved in the environmental management of the project; • establish procedures for consulting with the local community and relevant agencies about the operation and environmental performance of the project; and • establish procedures for handling of complaints, disputes, non-compliances and emergency response. The EMS will be prepared in consultation with Uralla Shire Council as required, and to the satisfaction of the Secretary of DPE.

Appendix C
Figures

EMM
creating opportunities



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Source: EMM (2022); UPC (2022); DFSI (2017, 2022); GA (2011)

0 1 2 km

GDA 1994 MGA Zone 56

N

KEY

- Proposed project boundary *
- Modification area
- Additional substation/BESS footprint

Proposed development footprint

- Solar array
- Potential site access and electrical cabling
- Potential laydown area/site compound
- Potential substation/BESS footprint **
- Hardstand in rail corridor
- Primary vehicle access route
- Potential creek crossing
- Proposed primary site access point

Existing environment

- Rail line
- Main road
- Local road
- Watercourse/drainage line
- Waterbody

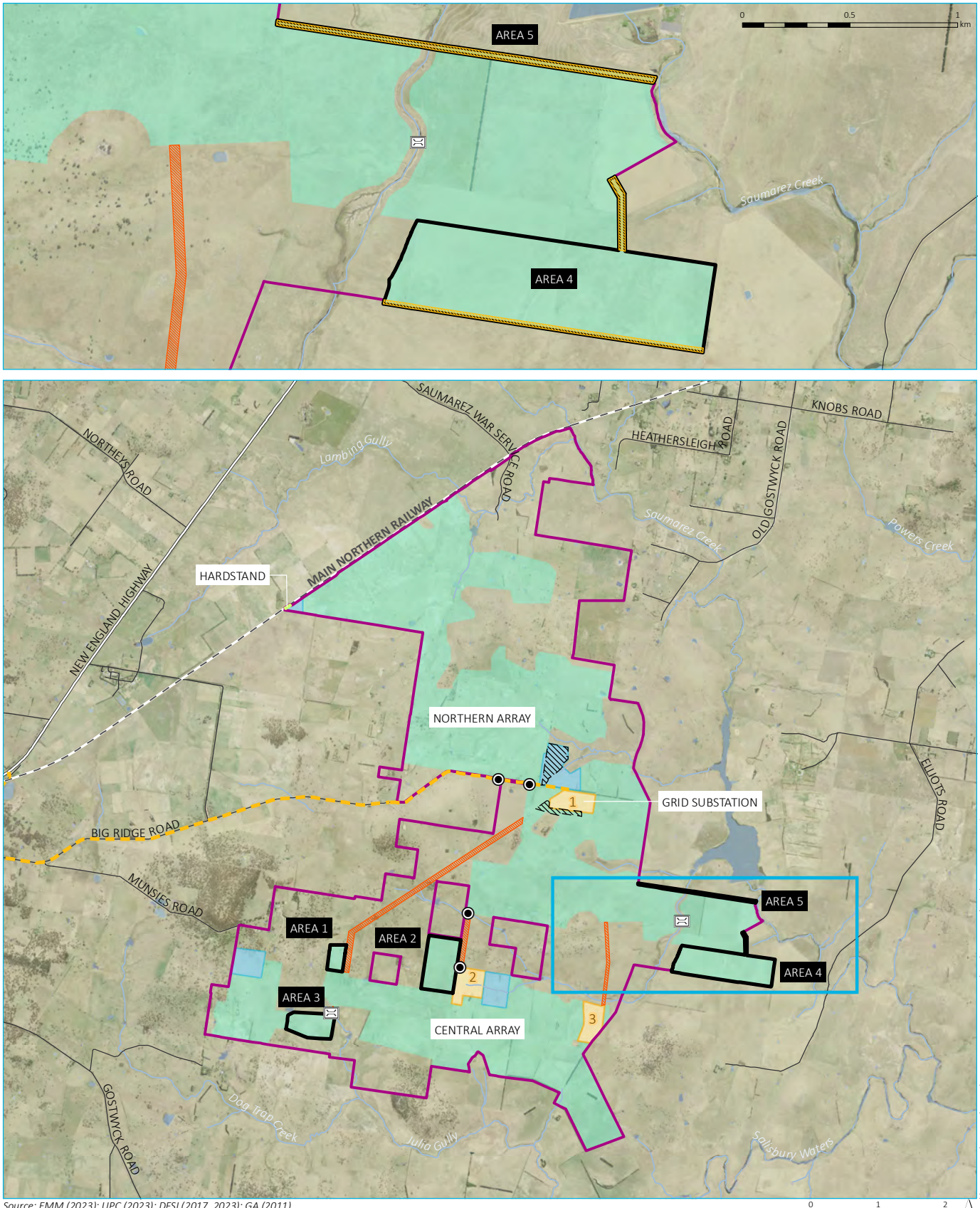
* The extent of Lot 1 of DP 227322 within the development footprint is 205.4 hectares, which represents approximately 8.4% of the total lot. Subsequently, the full extent of Lot 1 of DP 227322 has been excluded from the project boundary.

** The grid substation (location 1) and only one of potential substation location numbers 2 or 3 to be constructed

Modification area

New England Solar and Battery Project
Amendment Report
Figure C.1

EMM creating opportunities



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Source: EMM (2023); UPC (2023); DFSI (2017, 2023); GA (2011)

KEY

- Proposed project boundary *
- Modification area
- Additional modification area
- Additional substation/BESS footprint
- Proposed development footprint
- Solar array
- Potential site access and electrical cabling
- Potential laydown area/site compound
- Potential substation/BESS footprint **
- Hardstand in rail corridor
- Primary vehicle access route
- Potential creek crossing
- Proposed primary site access point

Existing environment

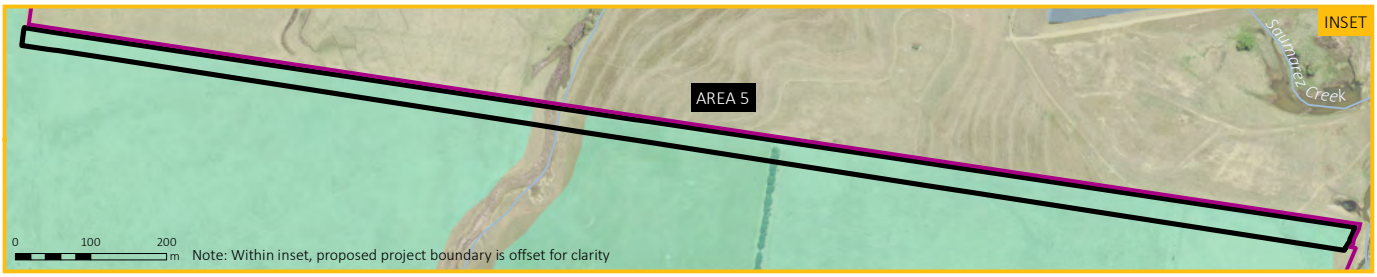
- Rail line
- Main road
- Local road
- Watercourse/drainage line
- Waterbody

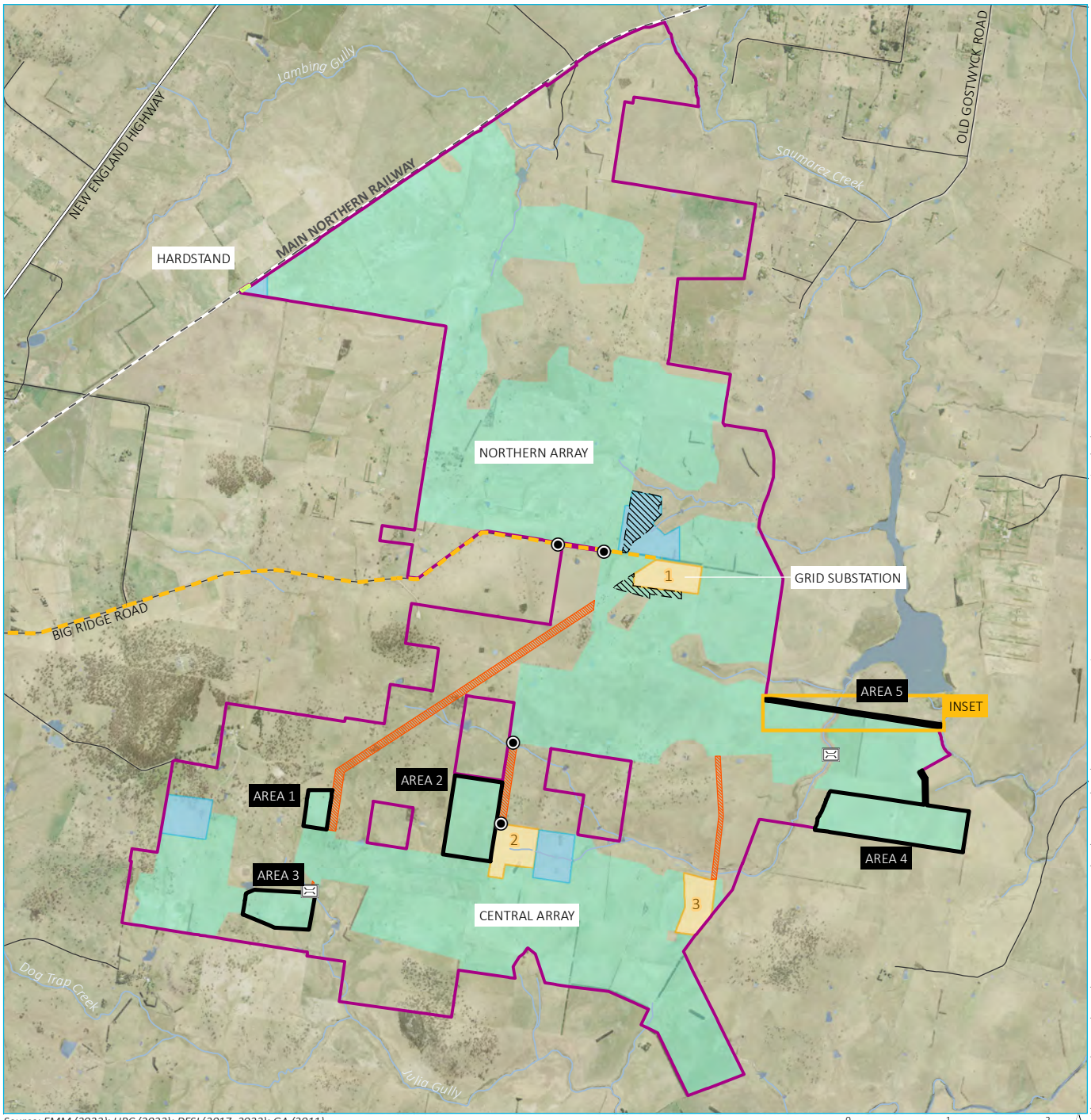
Amendment Area

* The extent of Lot 1 of DP 227322 within the development footprint is 205.4 hectares, which represents approximately 8.4% of the total lot. Subsequently, the full extent of Lot 1 of DP 227322 has been excluded from the project boundary.
** The grid substation (location 1) and only one of potential substation location numbers 2 or 3 to be constructed

New England Solar and Battery Project
Amendment Report
Figure C.2

EMM creating opportunities





Source: EMM (2022); UPC (2022); DFSI (2017, 2022); GA (2011)

0 1 2 km

GDA 1994 MGA Zone 56

N

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KEY

- Proposed project boundary *
- Modification area
- Additional substation/BESS footprint

Proposed development footprint

- Solar array
- Potential site access and electrical cabling
- Potential laydown area/site compound
- Potential substation/BESS footprint **
- Hardstand in rail corridor
- Primary vehicle access route
- Potential creek crossing
- Proposed primary site access point

Existing environment

- Rail line
- Main road
- Local road
- Watercourse/drainage line
- Waterbody

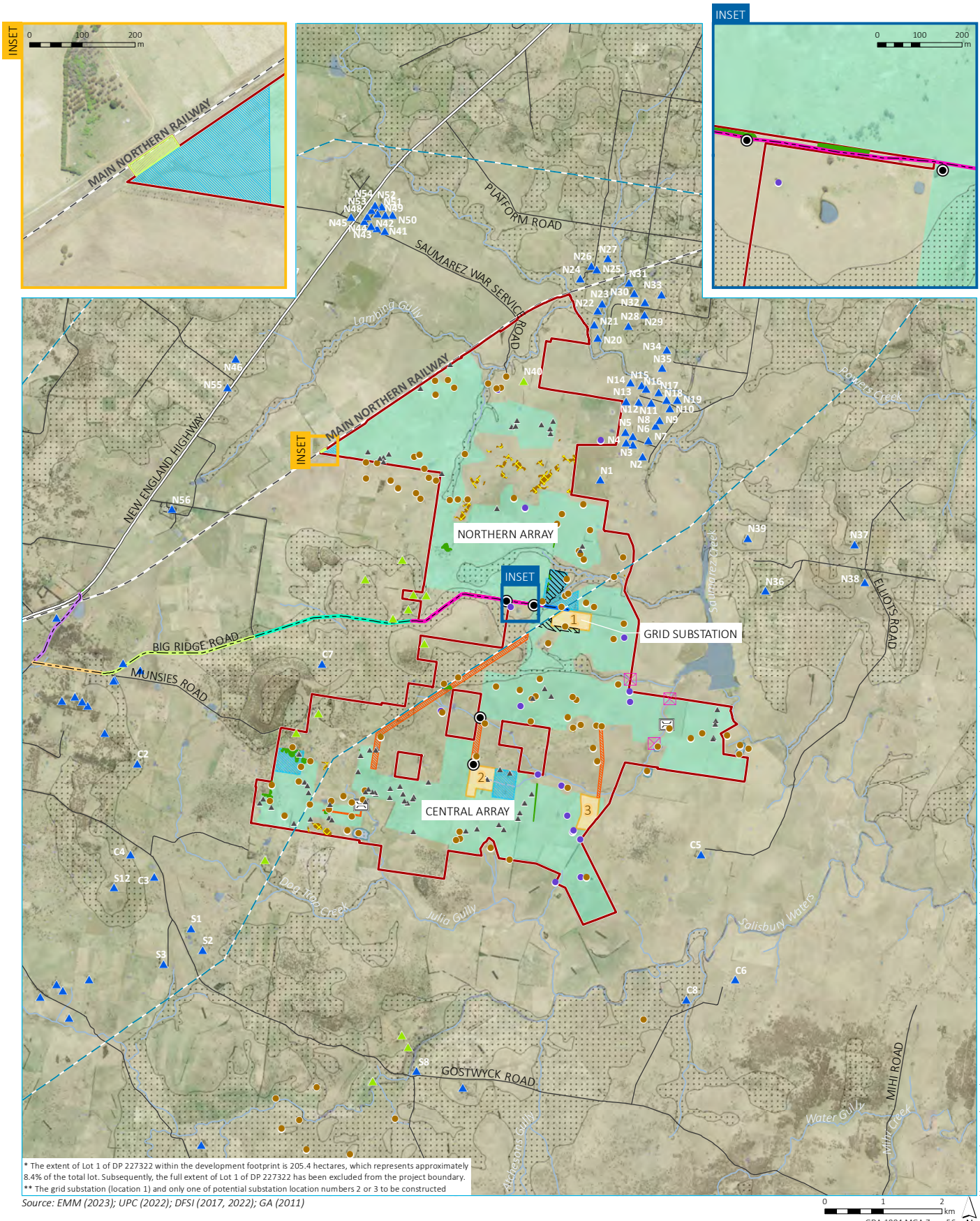
* The extent of Lot 1 of DP 227322 within the development footprint is 205.4 hectares, which represents approximately 8.4% of the total lot. Subsequently, the full extent of Lot 1 of DP 227322 has been excluded from the project boundary.

** The grid substation (location 1) and only one of potential substation location numbers 2 or 3 to be constructed

Proposed project boundary and development footprint

New England Solar and Battery Project
Amendment Report
Figure C.3

EMM creating opportunities



* The extent of Lot 1 of DP 227322 within the development footprint is 205.4 hectares, which represents approximately 8.4% of the total lot. Subsequently, the full extent of Lot 1 of DP 227322 has been excluded from the project boundary.
** The grid substation (location 1) and only one of potential substation location numbers 2 or 3 to be constructed

Source: EMM (2023); UPC (2022); DFSI (2017, 2022); GA (2011)

0 1 2 km
GDA 1994 MGA Zone 56

N

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KEY

- 330 kV transmission line
- Rail line
- Main road
- Local road
- Watercourse/drainage line
- Waterbody
- Proposed project boundary *
- Additional substation/BESS footprint
- Biophysical Strategic Agricultural Land

Sensitive receptors
- Project-related
- Non-project related

Proposed development footprint
- Solar array
- Potential site access and electrical cabling
- Potential laydown area/site compound
- Potential substation/BESS footprint **
- Hardstand in rail corridor
- Potential creek crossing
- Proposed primary site access point
- Indicative location of security fencing across third order watercourse

- Historic heritage site
- Identified Aboriginal site
- PAD area
- Paddock tree requiring offset
- Plant community requiring offset

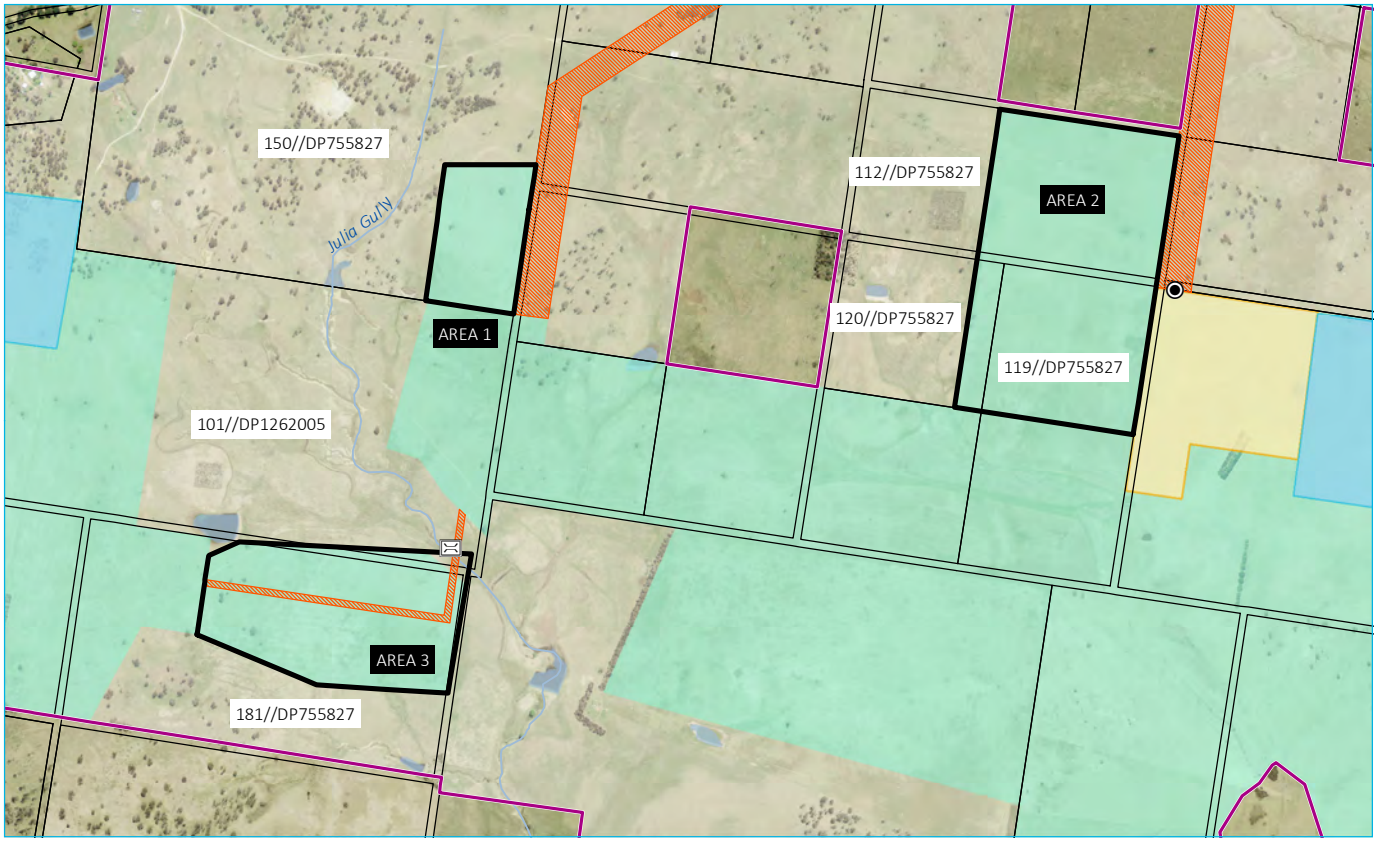
Plant community type avoidance area
- PCT 510 woodland

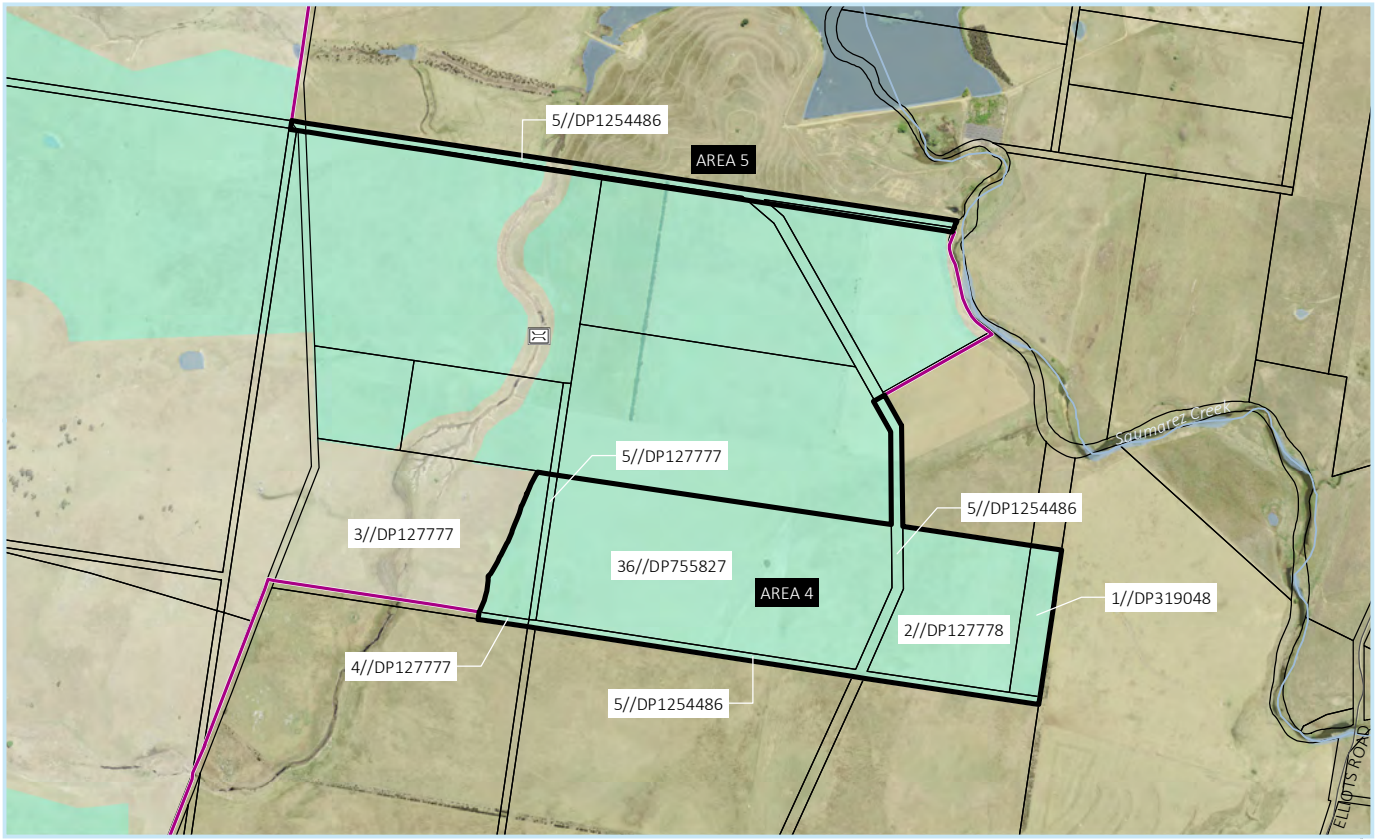
Primary vehicle access route
- Barleyfields Road
- Big Ridge Road - segment 1
- Big Ridge Road - segment 2
- Big Ridge Road - segment 3
- Big Ridge Road - segment 4
- Big Ridge Road - segment 5

Project layout

New England Solar and Battery Project
Amendment Report
Figure C.4

EMM creating opportunities





Source: EMM (2022); UPC (2021); DFSI (2017, 2022); GA (2011)

0 0.5 1 km

GDA 1994 MGA Zone 56

N

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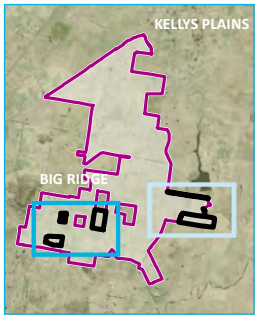


KEY

- Proposed project boundary
- Modification area

Proposed development footprint

- Solar array
- Potential site access and electrical cabling
- Potential laydown area/site compound
- Potential substation/BESS footprint
- Potential creek crossing
- Proposed primary site access point

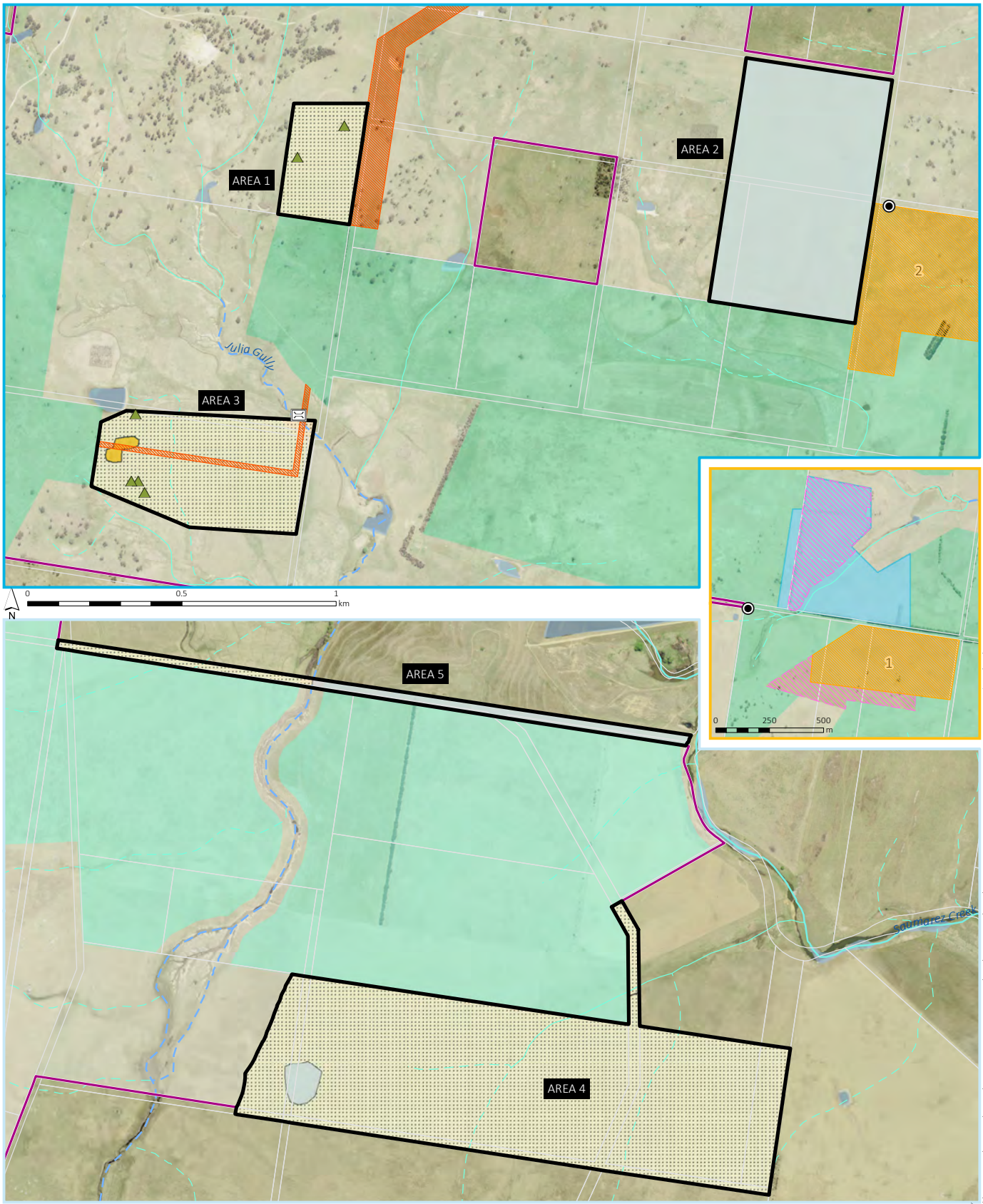
Existing environment

- Minor road
- Named watercourse
- Waterbody
- Cadastral boundary

Additional land parcels within the modification area

New England Solar and Battery Project
Amendment Report
Figure C.5

EMM
creating opportunities



Source: EMM (2022); UPC (2021); DFSI (2017, 2022); DPI (2015); GA (2011)

0 250 500 m

GDA 1994 MGA Zone 56

N

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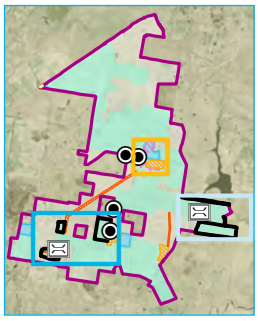


KEY

- Proposed project boundary
- Modification area
- Additional substation/BESS footprint

Approved development footprint

- Solar array
- Hardstand in rail corridor
- Potential site access and electrical cabling
- Potential laydown area/site compound
- Potential substation/BESS footprint
- Proposed primary site access point
- Potential creek crossing

Existing environment

- Minor road
- Cadastral boundary
- Waterbody
- Scattered tree
- Exotic grassland

PCT 510 | Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion

- Poor (requiring offset)
- Pasture

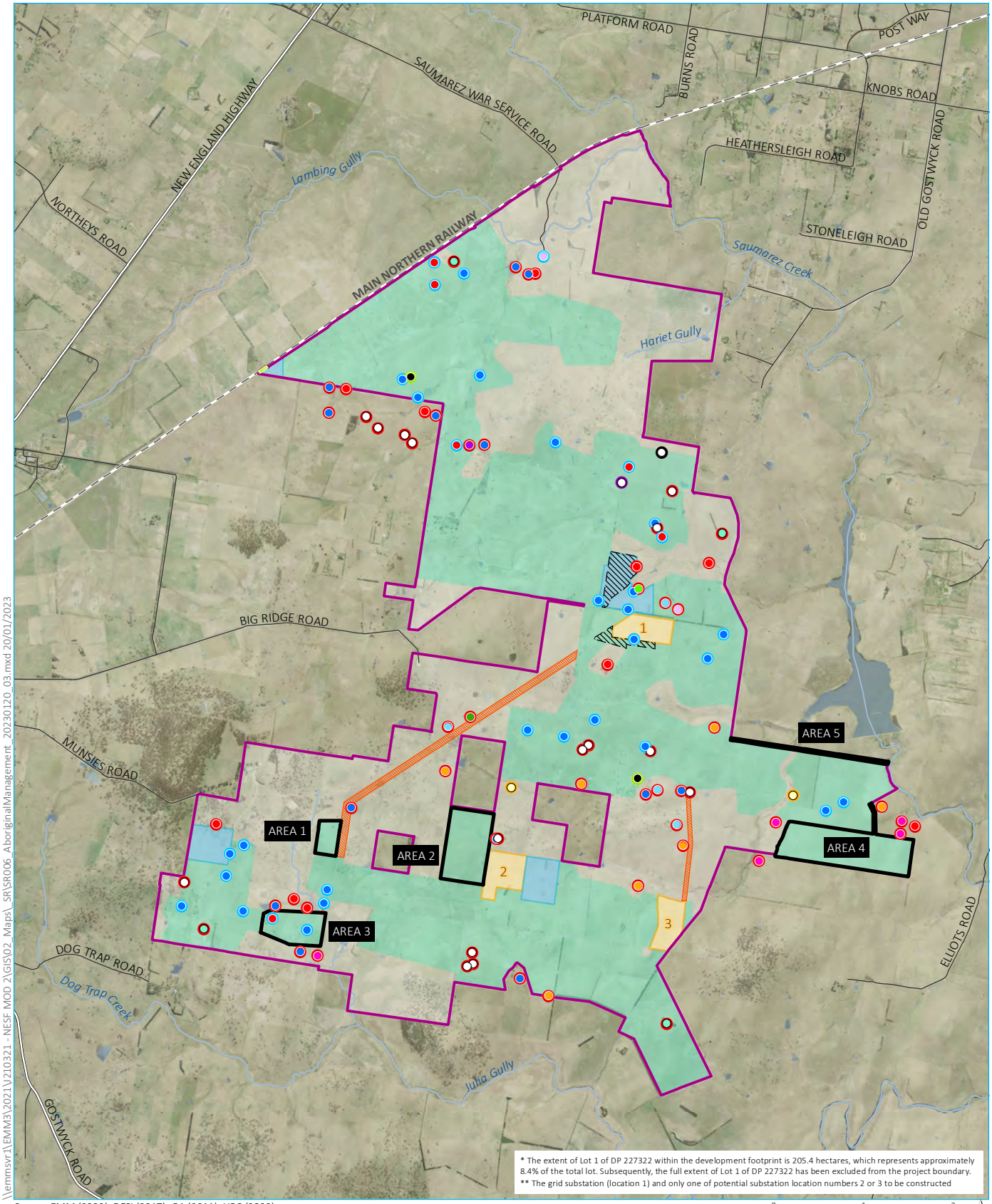
Strahler stream order

- 1st order
- 2nd order
- 3rd order

Vegetation zones and paddock trees

New England Solar and Battery Project
Amendment Report
Figure C.6

EMM creating opportunities



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Source: EMM (2022); DFSI (2017); GA (2011); UPC (2022)

0 1 2 km

GDA 1994 MGA Zone 56

N

KEY

- Proposed project boundary *
- Modification area
- Additional substation/ BESS footprint

Proposed development footprint

- Solar array
- Potential site access and electrical cabling
- Potential laydown area/ site compound
- Potential substation/ BESS footprint **
- Hardstand in rail corridor

Existing environment

- Rail line
- Major road
- Minor road
- Named watercourse
- Waterbody

Management measure

- Avoidance
- Avoid significant area
- Surface collection
- Salvage: remove and relocate
- No management required
- Unmitigated impact (tree has collapsed)

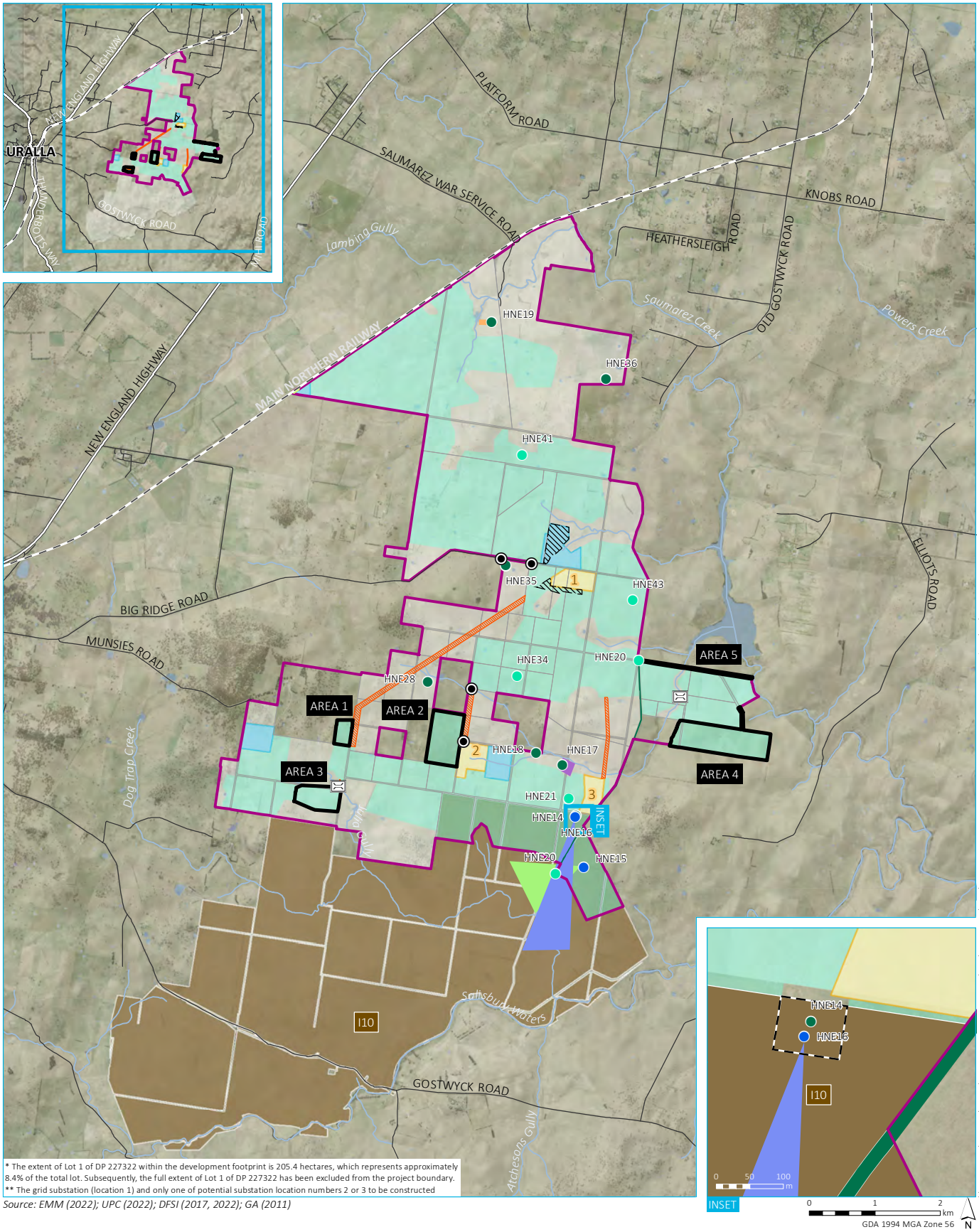
Site type

- Potential archaeological deposit (PAD)
- Artefact scatter
- Artefact scatter, PAD
- Artefact scatter, confirmed deposit, PAD
- Grinding groove
- Grinding groove, PAD
- Grinding groove, artefact scatter, PAD
- Isolated find
- Isolated find, PAD
- Isolated find, confirmed deposit, PAD
- Quarry, artefact scatter, PAD
- Scarred tree
- Not an Aboriginal scar tree

Aboriginal cultural heritage

New England Solar and Battery Project
Amendment Report
Figure C.7

EMM creating opportunities



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** The grid substation (location 1) and only one of potential substation location numbers 2 or 3 to be constructed

Source: EMM (2022); UPC (2022); DFSI (2017, 2022); GA (2011)

KEY

- Proposed project boundary *
- Modification area
- Additional substation/BESS footprint

Proposed development footprint

- Solar array
- Potential site access and electrical cabling
- Potential laydown area/site compound
- Potential substation/BESS footprint **
- Hardstand in rail corridor
- Potential creek crossing
- Proposed primary site access point

Indicative site boundaries

- HNE15
- HNE16
- HNE17
- HNE19
- HNE20

Impact type

- None
- Physical
- Visual
- Avoidance buffer (HNE14)

Existing environment

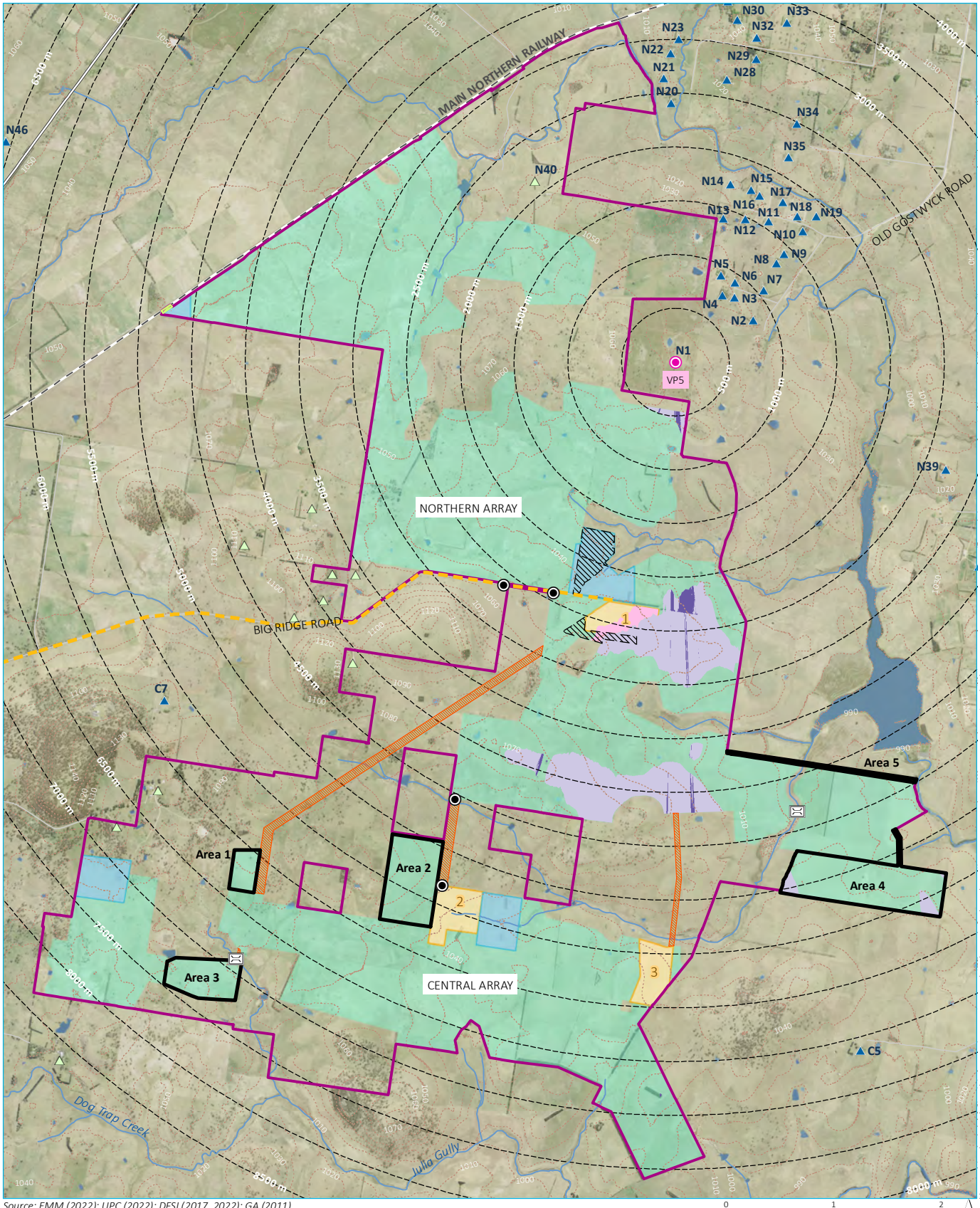
- Rail line
- Main road
- Local road
- Watercourse/drainage line
- Waterbody
- Uralla LEP listing - item

Note: HNE37 is not shown as a point as it is representative of the cultural landscape

Project impacts to heritage values

New England Solar and Battery Project
Amendment Report
Figure C.8

EMM creating opportunities



Source: EMM (2022); UPC (2022); DFSI (2017, 2022); GA (2011)

0 1 2 km

GDA 1994 MGA Zone 56

N

KEY

- Proposed project boundary
- Modification area
- Additional substation/BESS footprint

Proposed development footprint

- Solar array
- Potential site access and electrical cabling
- Potential laydown area/site compound
- Potential substation/BESS footprint
- Hardstand in rail corridor
- Primary vehicle access route
- Proposed primary site access point
- Potential creek crossing

Existing environment

- Rail line
- Main road
- Local road
- Topographic contour (10 m increment)
- Watercourse/drainage line
- Waterbody

Sensitive receptors

- Project-related
- Non-project related

Visual impact assessment

- Viewpoint location
- Viewpoint buffer (500 m increments)

PV modules (assumed 4.3 m height)

- Visible infrastructure - accounting for shielding features in the landscape (eg vegetation)
- Visible infrastructure - bare earth surface

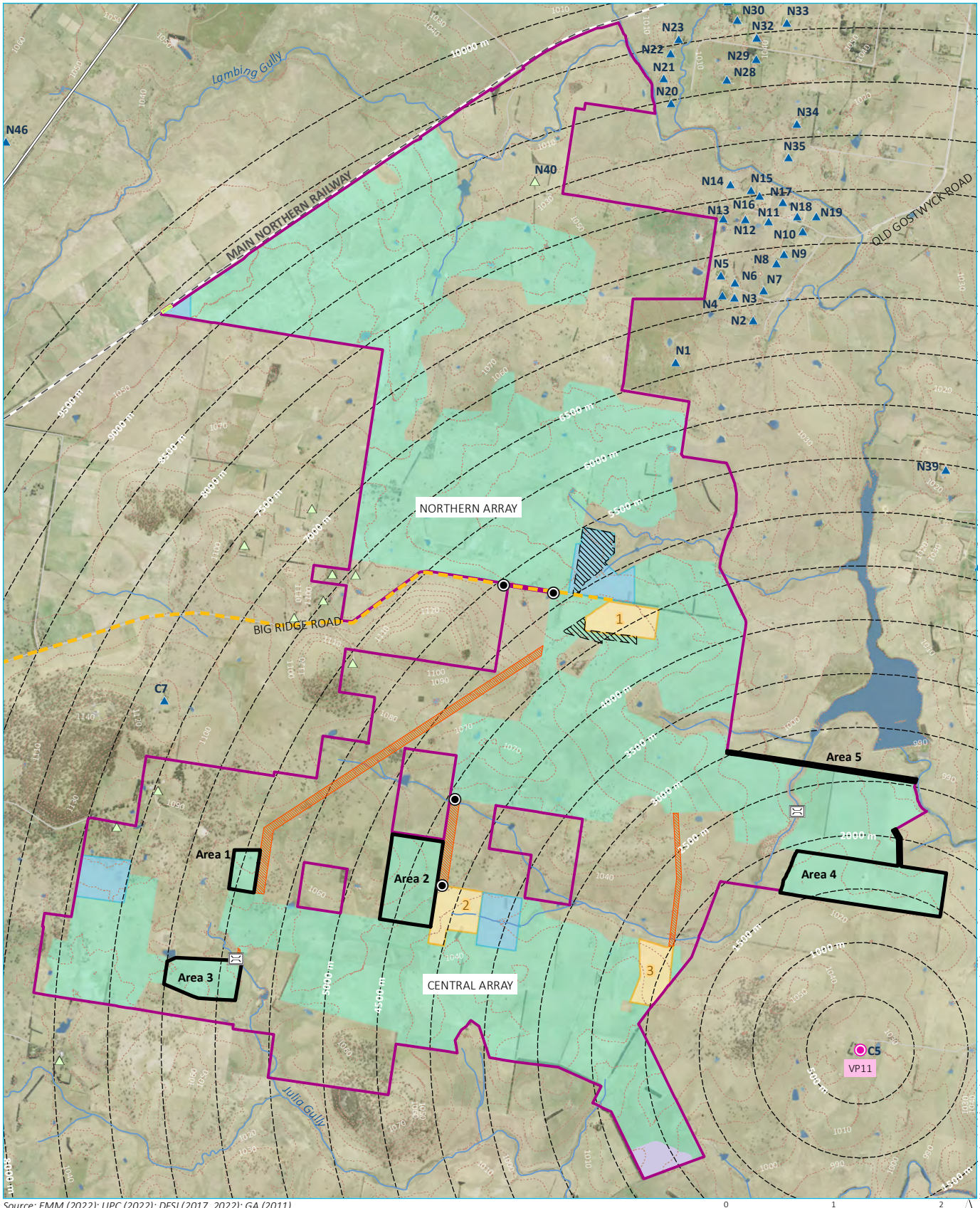
Battery energy storage system (assumed 7.5 m height)

- Visible infrastructure - bare earth surface

Viewpoint 5

New England Solar and Battery Project
Amendment Report
Figure C.9

EMM creating opportunities



Source: EMM (2022); UPC (2022); DFSI (2017, 2022); GA (2011)

0 1 2 km

GDA 1994 MGA Zone 56

N

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KEY

- Proposed project boundary
- Modification area
- Additional substation/BESS footprint

Proposed development footprint

- Solar array
- Potential site access and electrical cabling
- Potential laydown area/site compound
- Potential substation/BESS footprint
- Hardstand in rail corridor
- Primary vehicle access route
- Proposed primary site access point
- Potential creek crossing

Existing environment

- Rail line
- Main road
- Local road
- Topographic contour (10 m increment)
- Watercourse/drainage line
- Waterbody

Sensitive receptors

- Project-related
- Non-project related

Visual impact assessment

- Viewpoint location
- Viewpoint buffer (500 m increments)

PV modules (assumed 4.3 m height)

- Visible infrastructure - bare earth surface

Viewpoint 11

New England Solar and Battery Project
Amendment Report
Figure C.10

EMM creating opportunities

Appendix D

Aboriginal cultural heritage assessment addendum

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Inspired People.
Dedicated Team.
Quality Outcomes.

Our Ref: 22851_NESF_MOD2_Addendum_Final V1

1 December 2022

Developer
ACEN Australia

E| Tessa.verkerk@acenrenewables.com.au

Dear Tessa,

RE: New England Solar and Battery Project – Modification to SSD-9255. Addendum to Aboriginal Cultural Heritage Assessment for Modification 2

1.0 Introduction

1.1 Project Background

ACEN Australia Pty Ltd (ACEN Australia) (formerly named UPC Renewables Australia Pty Ltd) has approval to develop the New England Solar and Battery Project; a significant grid-connected solar farm and battery energy storage system (BESS) along with associated infrastructure, approximately 6 kilometres (km) east of the township of Uralla, which lies approximately 19 km south of Armidale, in the Uralla Shire local government area (LGA) (the project). The project was approved, subject to conditions, by the NSW Independent Planning Commission (IPC) on 9 March 2020 (SSD-9255).

The project is within the New England Renewable Energy Zone (REZ), which has been formally declared by the NSW Minister for Energy under Section 19(1) of the NSW *Electricity Infrastructure Investment Act 2020*. The New England region of NSW has been selected by the NSW Government for the development of the New England REZ due to its significant natural energy resources and has an intended network capacity of 8 gigawatts (GW).

ACEN Australia is seeking approval to amend the project boundary and development footprint to include additional land adjacent to the approved solar array areas. The proposed modification also includes an increase to the project's energy storage capacity, an increase in the number of over-dimensional vehicle movements permitted to access the site during construction, upgrading and decommissioning, an increase in the number of daily heavy vehicle movements and an increase in the project's construction hours.

Umwelt (Australia) Pty Limited

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A modification report was prepared to support the application to modify SSD-9255. As part of the modification report, EMM Consulting Pty Limited (EMM) prepared an Aboriginal cultural heritage assessment (ACHA), which included Aboriginal community consultation and an archaeological survey program (EMM 2022) (refer Appendix E of the modification report). This ACHA is referred to as the 'Modification ACHA'.

Since the submission of the modification report, ACEN Australia has identified an additional approximately 8.9 hectares (ha) of land suitable for inclusion in the project boundary and development footprint. This land has recently been acquired by a project landholder (as a result of the closure of three Crown 'paper' roads) and adjoins the existing approved project boundary and/or modification area.

The proposed inclusion of the additional land in the project boundary and development footprint is likely to result in additional surface disturbance activities that were not assessed as part of the modification report and Modification ACHA. Subsequently, this addendum to the Modification ACHA has been prepared to consider potential impacts to Aboriginal cultural heritage as a result of the inclusion of the additional land area in the project boundary and development footprint and identify appropriate mitigation and management measures, where required.

1.2 Purpose Of This Report

Umwelt has prepared this addendum to the Modification ACHA (EMM 2022) to present the outcomes of the additional assessment and to provide updated management measures in response to the findings of additional archaeological investigations.

1.3 Description Of Proposed Works and Modification Extension Area

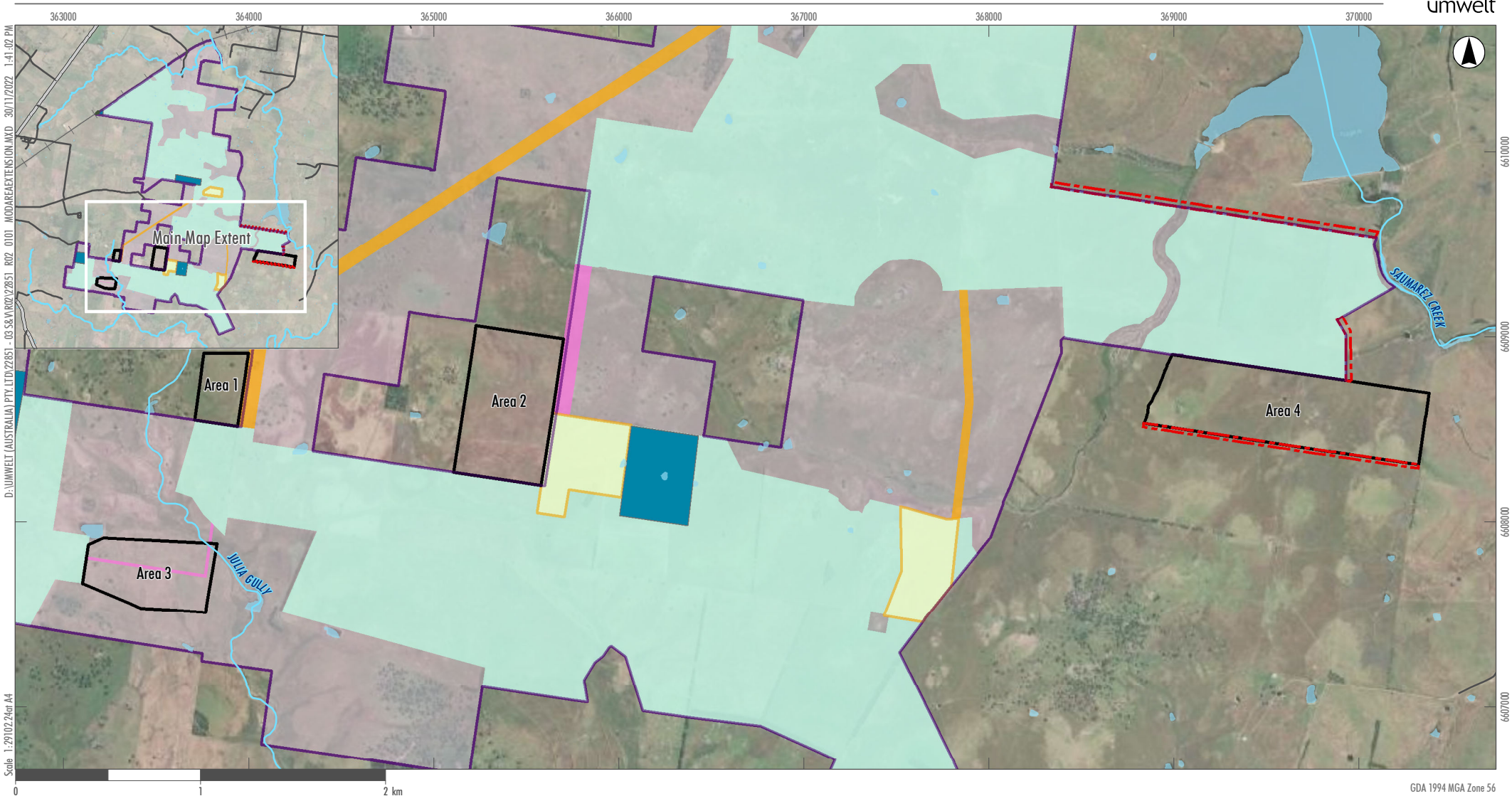
The project boundary and development footprint will be extended to accommodate the modification area, now inclusive of the Modification Extension Area (**Figure 1.1**). The land within the modification area will form part of the project boundary and development footprint and will predominantly be used to house photovoltaic (PV) modules, power conversion units (PCU) and the medium voltage cable reticulation network. Operations and maintenance infrastructure and internal roads may also be installed within the modification area.

2.0 Aboriginal Consultation

The *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010a) were followed for the Modification ACHA from ongoing process for the original project in 2018 as part of the *New England Solar Farm Aboriginal Cultural Heritage Assessment* (EMM 2018). Consultation for the Modification ACHA involved continuing consultation with the nine project Registered Aboriginal Parties (RAPs) which is detailed in Section 2 of the Modification ACHA.

RAPs were invited to participate in the field survey for the Modification Extension Area which was undertaken in October 2022 concurrently with archaeological fieldwork required as part of the project's Aboriginal heritage management plan (AHMP) (EMM 2021). RAPs will be provided with a copy of this report to keep them informed about the proposed modification.

No further comment has been sought on the content of this report due to its minor scope. Further, additional impacts to Aboriginal cultural heritage values are not anticipated (Section 5) of this report.



Legend

- Modification Extension Areas
- Modification Areas
- Approved Project Boundary

Approved Development Footprint

- Solar array
- Potential Electrical Cabling
- Potential site access/ETL easement
- Potential Laydown Area/Site Compound
- Potential Substation/BESS Footprint
- Hardstand in Rail Corridor

Existing Environment

- Major Road
- Minor Road
- Railway Line
- Named Watercourse
- Waterbody

FIGURE 1.1

Modification Extension Areas

Image Source: ESRI Basemap Data source: NSW DFSI (2022), EMM (2022)

3.0 Background

3.1.1 Aboriginal Heritage Context

An overview of the Aboriginal cultural heritage context relevant to the project is provided in Section 4 of the Modification ACHA. In summary, the archaeological record and cultural values identified as part of the project are the result of archaeological investigations (field survey and test excavations) and ongoing Aboriginal community consultation with RAPs. A total of 100 Aboriginal sites were identified during the course of the main project ACHA, inclusive of the ACHA addendum investigations and assessment (EMM 2018, EMM 2019a, EMM 2019b). Additionally, as part of the Modification ACHA, the survey team identified 12 Aboriginal sites and 5 areas of potential archaeological deposit (PAD) (total 17 sites) within the study area subject to survey in 2021. The site features comprised 3 isolated artefacts, 4 Aboriginal scarred trees, 5 open artefact scatters and 5 PADs. Consequently, 117 Aboriginal sites have been recorded as part of archaeological investigations for the project.

The Modification Extension Area had been partially sampled during archaeological survey fieldwork for the main project ACHA and the Modification ACHA as shown on **Figure 3.1.** The southernmost portion of the Modification Extension Area received a substantial survey effort during the Modification ACHA in 2021 as it was part of the Modification ACHA study area that was subsequently refined. As such, it was not considered to warrant additional survey for this addendum assessment. However, northern two portions of the Modification Extension Area (abutting the approved project boundary) was subject to comprehensive survey for this addendum report for added diligence (refer **Section 4.0**) considering that the areas had not been specifically targeted during previous survey fieldwork.

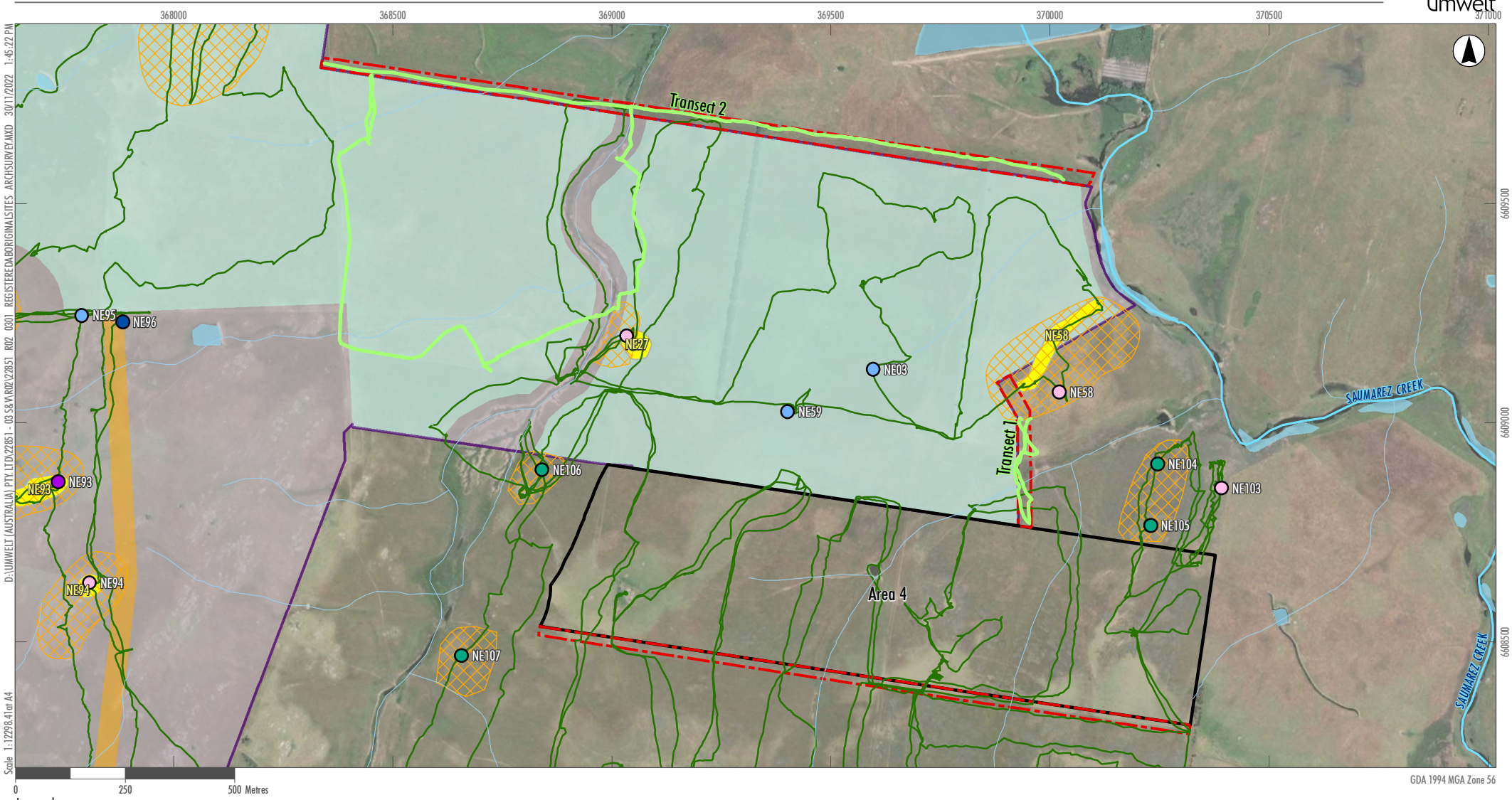
3.1.2 Previously Recorded Sites

The Aboriginal site results featured in the Modification ACHA and project AHMP were reviewed to determine if any previously recorded sites intersect with the Modification Extension Area. Additionally, Umwelt completed an AHIMS search over the Modification Extension Area on 18 November 2022 for added diligence (attached to this report). The local context of previously recorded sites is shown in **Figure 3.1**.

The Modification Extension Area intersects with one previously recorded site: NE58 (AHIMS #21-4-0252). NE58 is a small stone artefact scatter with an associated area of PAD. The area of PAD is attributed to a very broad crest (approximately 300 m x 200 m) that borders Saumarez Creek, a 5th Order (Strahler Stream Order) stream. This site is subject to ongoing active avoidance as part of the project AHMP and will undergo protective fencing prior to nearby project development activities.

3.1.3 Landscape Summary and Archaeological Implications

Previous investigations for the project demonstrate that local archaeological material has a close connection with geological, topographical and hydrological characteristics. These environmental features can be used to predict the presence and distribution of cultural materials within the Modification Extension Area. The archaeology and landscape review is presented in **Table 3.1**. Overall, the general archaeological sensitivity of the broader landscape in the two northernmost portions of the Modification Extension Area warranted further investigation in the form of archaeological survey.



Legend

- Modification Extension Areas
- Modification Areas
- Approved Project Boundary

Approved Development Footprint

- Solar array
- Potential Electrical Cabling

Aboriginal Sites

- Open artefact site
- Grinding Groove
- Isolated find
- PAD
- Scarred tree
- Aboriginal Site Areas
- PAD Minimum Avoidance Area

- New Survey
- Previous Archaeological Surveys

- Named Watercourse
- Un-named Watercourse
- Waterbody

FIGURE 3.1

Registered Aboriginal Sites and Archaeological Survey

Image Source: ESRI Basemap Data source: NSW DFSI (2022), EMM (2022)

Table 3.1 Landscape and Archaeological Review of Modification Extension Area

Landscape Summary	Implications for Archaeology
Hydrology and topography Elevation range between 1,010 and 990 metres Australian Height Datum (m AHD). Primarily broad continuous simple slopes and broad crests intersected by tributaries of Saumarez Creek. **Soil landscape and geology** Soil landscape comprises Gostwyck (granites and silcrete). **Soil summary** A horizon is a shallow loamy sand 0–18 cm depth with an underlying B horizon of brown clayey sand up to 45 cm. Area is predominantly cleared of all native vegetation. Northern portion of Modification Extension Area features a windrow of exotic pine trees.	This area has only been subject to partial previous archaeological survey. Landscape features within 200 m of Saumarez Creek at the eastern border and its tributary on the western border may feature open artefact sites with PAD on suitably elevated landforms or rocky/boulder crests. This is evidenced by one existing site with PAD on a crest: NE58. Aerial imagery indicates that mature native trees are absent from this property, and therefore the presence of Aboriginal scarred or carved trees is unlikely. The remainder of the landscape, notably on crests and spurs, may feature outcropping silcrete pavements and boulders common to the Gostwyck Soil landscape. These have potential for grinding groove or quarry sites.

4.0 Archaeological Survey Results and Discussion of Archaeological Potential

An Umwelt archaeologist and three project RAP representatives conducted an archaeological field survey of the Modification Extension Area on 12 October 2022. The archaeological survey and data collection methods followed Section 2.2 of the Code (DECCW 2010b). The survey involved pedestrian field transects within defined landform units. The survey sampling approach was considered comprehensive and each of the survey participants were spaced equally within approximate 20 m linear corridors that made up the two northernmost portions of Modification Extension Area.

The survey was divided into two walking transects based on the two northernmost separated portions of the Modification Extension Area (**Figure 3.1**). Transect 1 was approximately 800 m in length and covered a portion of a broad hill crest (**Photo 4.1**), a simple slope and the boggy drainage depression of a second order tributary of Saumarez Creek (**Photo 4.2**). The crest portion of this transect covered a portion of the PAD area of NE58 but no Aboriginal objects were identified. Transect 2 was approximately 1.8 km in length and covered broad undulating simple slopes that are dissected by an unnamed 3rd order tributary of Saumarez Creek (**Photo 4.3** and **Photo 4.4**).

Landform effective coverage data is provided in **Table 4.1**. Overall, ground surface visibility conditions were extremely constrained due to thick paddock grass and effective survey coverage was estimated to be at less than 5%. No rock outcrops or mature native trees were observed. With the exception of the previously mapped PAD area of NE58, no Aboriginal objects or areas of archaeological potential were identified during the survey.

Despite the Modification Extension Area bordering some relatively reliable watercourses, the portions of the surveyed land bordering these watercourses are low-lying in relation to the surrounding landscape. With the exception of the broad hill crest of NE58, no other areas are considered suitable to be considered a PAD or suitable to feature traceable subsurface evidence of Aboriginal occupation elevated (e.g. compared with NE27 approximately 500 m to the south on elevated terrain). Rather, the areas surveyed are prone to water logging where they occur near reliable drainage features.

Table 4.1 Survey Transect Effective Coverage Summary

Transect	Survey method	Landform class	Area (m^2)	Exposure (%)	Visibility (%)	Effective survey coverage (m^2)	Effective survey coverage (%)	Results
1	Pedestrian	Undulating slope with small crest portion	798	5%	50%	399	3	Transect intersects with portion of registered site NE58 which has moderate archaeological potential. Remainder of transect assessed to have low archaeological potential.
2	Pedestrian	Undulating slope	1,800	5%	50%	900	3	No Aboriginal objects identified. Transect assessed to have low archaeological potential.

Photo 4.1 Northern extent of Transect 1 on the PAD area of NE58, with a view south towards a drainage depression and ephemeral tributary of Saumarez Creek

Photo 4.2 Southern extent of Transect 1 within a low lying and boggy depression

Photo 4.3 Eastern extent of Transect 2, showing low lying boggy terrain at eastern end of Modification Extension Area next to Saumarez Creek and gently inclining terrain to the west

Photo 4.4 Western extent of Transect 2 showing gently declining landscape towards a tributary of Saumarez Creek

5.0 Impact Assessment and Management Measures

No new Aboriginal objects or areas of archaeological potential were identified from the survey effort and additional assessment. However, the Modification Extension Area does intersect with registered site NE58. NE58 was assessed to have moderate archaeological significance, because although the surface expression of the site has limited archaeological significance, further investigation through test excavation would clarify if the site features archaeological deposit relating to a broad elevated landform adjacent to a focal and reliable watercourse in the local area.

ACEN Australia has adopted an approach consistent with the Modification ACHA (EMM 2022), whereby identified PAD areas have been excluded from the development footprint. Accordingly, ACEN will maintain the avoidance measure applied to NE58 as currently set out in the project AHMP. In summary, NE58 will not be impacted as a result of the proposed modification.

In alignment with Section 10.1 of the Modification ACHA, the AHMP will be updated to reflect the proposed changes to the project boundary as a result of the Modification ACHA including the Modification Extension Area. All other matters related to Aboriginal cultural heritage management within the Modification Extension Area, including the protocols for the discovery of new Aboriginal sites and the management of potential and confirmed Aboriginal human remains, will be addressed in the updated AHMP.

We trust this information meets with your current requirements. Please do not hesitate to contact the undersigned on 1300 793 267 should you require clarification or further information.

Yours sincerely,

Ryan Desic
Principal Archaeologist – NSW/ACT Aboriginal Heritage Team Lead

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M| 0411 329 712

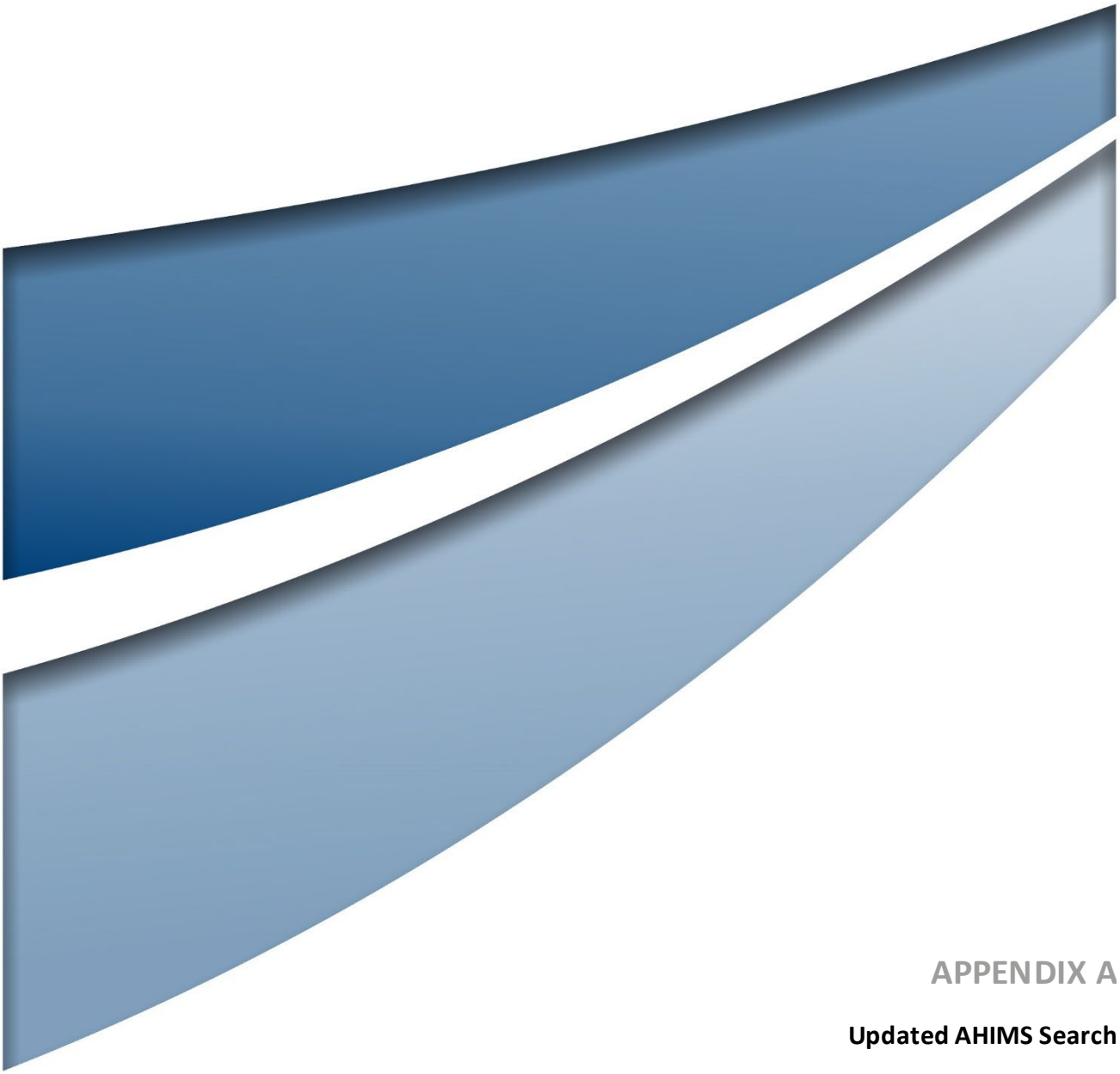
6.0 References

Department of Climate Change and Water (DECCW) 2010a*, Aboriginal Cultural Heritage Consultation Requirements for Proponents*

- 2010b, Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW.

EMM Consulting Pty Limited (EMM) 2018, *New England Solar Farm – Aboriginal cultural heritage assessment,* prepared for UPC November 2018.

- 2019a, New England Solar Farm - Addendum to the Aboriginal cultural heritage assessment report, prepared for UPC June 2019.
- 2019b, New England Solar Farm, Proposed Road Upgrades, addendum to the Aboriginal cultural heritage assessment report, prepared for UPC September 2019.
- 2021, New England Solar Farm Aboriginal Heritage Management Plan, prepared for UPC/AC Renewables (Australia) Pty Ltd.
- 2022, Aboriginal Cultural Heritage Assessment, New England Solar Farm – Modification 2, prepared for UPC/AC Renewables (Australia) Pty Ltd.



APPENDIX A

Updated AHIMS Search

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 22851 - NESF MOD 2

Client Service ID : 733669

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
21-4-0286	NE93	GDA	56	367737	6608865	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1, Grinding Groove : 1		
Contact		Recorders	Mr.Ryan Desic,EMM Consulting - St Leonards - Individual users					Permits		
21-4-0287	NE94	GDA	56	367809	6608634	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
Contact		Recorders	Mr.Ryan Desic,EMM Consulting - St Leonards - Individual users					Permits		
21-4-0288	NE96	GDA	56	367884	6609230	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
Contact		Recorders	Mr.Ryan Desic,EMM Consulting - St Leonards - Individual users					Permits		
21-4-0198	NE03	GDA	56	369597	6609122	Open site	Valid	Artefact : 1		
Contact		Recorders	Mr.Ryan Desic,EMM Consulting - St Leonards - Individual users					Permits		
21-4-0233	NE38	GDA	56	368160	6609949	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
Contact		Recorders	Mr.Ryan Desic,EMM Consulting - St Leonards - Individual users					Permits		
21-4-0252	NE58	GDA	56	370022	6609070	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
Contact		Recorders	Mr.Ryan Desic,EMM Consulting - St Leonards - Individual users					Permits		
21-4-0253	NE59	GDA	56	369402	6609025	Open site	Valid	Artefact : 1		
Contact		Recorders	Mr.Ryan Desic,EMM Consulting - St Leonards - Individual users					Permits		
21-4-0222	NE27	GDA	56	369035	6609198	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
Contact		Recorders	Mr.Ryan Desic,EMM Consulting - St Leonards - Individual users					Permits		

**** Site Status**

Valid - The site has been recorded and accepted onto the system as valid

Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.

Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground

Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

Report generated by AHIMS Web Service on 18/11/2022 for Ryan Desic for the following area at Lat, Long From : -30.6494, 151.6184 - Lat, Long To : -30.6309, 151.6493. Number of Aboriginal sites and Aboriginal objects found is 8

Australia

SYDNEY
Ground floor 20 Chandos Street
St Leonards NSW 2065
T 02 9493 9500

NEWCASTLE
Level 3 175 Scott Street
Newcastle NSW 2300
T 02 4907 4800

BRISBANE
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Spring Hill QLD 4000
T 07 3648 1200

CANBERRA
Suite 2.04 Level 2
15 London Circuit
Canberra City ACT 2601

ADELAIDE
Level 4 74 Pirie Street
Adelaide SA 5000
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Melbourne VIC 3000
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PERTH
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