APPENDIX I

Visual impact assessment

New England Solar Farm

Visual Impact Assessment

Prepared for UPC Renewables Australia Pty Ltd | January 2019

New England Solar Farm

Visual impact assessment

Prepared for UPC Renewables Australia Pty Ltd | 11 January 2019

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New England Solar Farm

Final

Report J17300RP1 | Prepared for UPC Renewables Australia Pty Ltd | 11 January 2019

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Date	11 January 2019	Date	11 January 2019

Document Control

Version	Date	Prepared by	Reviewed by
1	25/9/2018	D Richards	C Burnes
2	1/11/2018	D Richards	C Burnes
3	14/11/2018	D Richards	C Burnes
4	11/1/2019	D Richards	C Burnes

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Executive Summary

UPC Renewables Australia Pty Ltd (UPC) proposes to develop the New England Solar Farm; 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).

A visual impact assessment (VIA) was completed for the project to assess impacts from 19 representative viewpoints surrounding the development footprint. The representative viewpoints were selected based on the following criteria:

- proximity to the project's three array areas;
- the location of receptors (ie dwellings);
- the positioning of regional and local roads and potential impacts on passing motorists;
- the location of items of local heritage significance listed within the Uralla Local Environmental Plan 2012 (Uralla LEP);
- local topography; and
- presence of remnant vegetation and wind breaks with potential to provide screening.

The representative viewpoints have been assessed to demonstrate the potential visual impacts of the project. Due to existing mature vegetation, variable elevation and undulation in the landscape, and the height of the dominant project infrastructure, namely the PV modules, infrastructure within the three array areas will be relatively shielded from view at a number of the viewpoints assessed as part of this assessment.

The project design, development footprint and placement of the three array areas have progressively evolved to minimise or avoid visual impacts, where possible. This has included significant revisions to the extent of the northern and southern array areas. As part of the refinement process, an area of approximately 585 ha north of Salisbury Waters has been excluded from the development footprint for the southern array area. In addition, an area of approximately 315 ha has been excluded from the development footprint for the northern array area.

Nonetheless, the development of the project will result in some changes to the landscape. Visual impacts will occur during the construction and operational stages of the project. The visual landscape will be altered from its current state for the duration of the operational phase of the project.

The visual assessment determined that, of the viewpoints assessed, some infrastructure may be visible to varying degrees from 17 of the 19 viewpoints. Based on variable elevation and undulation in the landscape and the presence of vegetation, combined with the height of the PV modules, the impact assessment predicts:

- a slight visual impact for viewpoints 9, 12, 14, 18 and 19;
- a slight/moderate visual impact for viewpoints 3, 4, 10, 11, 13 (Thunderbolts Way and S17), 15, 16 and 17;

- a moderate visual impact for viewpoints 2, 5, 6, 7, 8 and 13 (Salisbury Court); and
- a potentially significant impact for Viewpoint 1 for the unmitigated scenario.

As a result of its close proximity to the boundary of the development footprint for the southern array area, without the implementation of appropriate mitigation measures, S9 will be exposed to views of project infrastructure. Although vegetation was observed along the boundary of this property, this vegetation is unlikely to provide a sufficient level of mitigation to reduce the visual impacts experienced from this viewpoint during the operation of the project. UPC will provide landscape screening to mitigate the visual impacts from S9.

In addition to proposed landscaping at S9, discussions between UPC, the relevant project landholder and the tenant at S11 will inform requirements for landscaping to mitigate views at Viewpoint 1.

Discussions between UPC and N1 are ongoing and include consideration of options for landscaping to address the potential visibility of project infrastructure from the southern aspect of the dwelling at Viewpoint 5, should it be required.

Visual impacts from three items of local heritage significance listed on the Uralla LEP have also been considered as part of this assessment. It is anticipated that distance between these items and the development footprint, existing remnant vegetation, planted vegetation and wind breaks will mitigate the visibility of project infrastructure in the southern array area from these locations.

As part of the management and mitigation measures to address the project's impacts on the cultural landscape (refer Appendix E of the EIS), detailed digital photographic archival recording is proposed to capture the setting, views and vistas that may be lost temporarily during the project's operations. However, it should be noted that the potentially impacted areas identified as part this assessment are not visible from public spaces and are on land owned by the project landholders.

Motorists travelling along the New England Highway may experience transitory and distant views (at a distance of approximately 2 km or more) of project infrastructure within the development footprint for the northern array area. As it is assumed that the focus of these motorists will be in line with their direction of travel along this road corridor and motorists will be travelling at the prescribed speed limit of 100 km/hr, any potential views are considered insignificant. Visual impacts were also assessed from a vantage point on Thunderbolts Way at an elevated location approximately 1.9 km from the development footprint for the southern array area.

If it proceeds, the construction of the project and the proposed Uralla Solar Farm being developed by Neoen Australia Pty Ltd (Neoen) may expand the overall area within the Uralla Shire LGA that is occupied by solar infrastructure. Based on the height of the dominant project infrastructure, namely the PV modules, variable elevation and undulation in the landscape, the presence of vegetation and separation distances between the northern array area and the Uralla Solar Farm, it is anticipated that there is limited potential for significant combined views of the project and the Uralla Solar Farm. In addition, two significant transport passages, ie the New England Highway and Main Northern Railway, separate the northern array area and the proposed site for Uralla Solar Farm, both of which will further restrict potential for combined views of the two projects (should they both be constructed).

This assessment concludes that the implementation of additional mitigation measures will ensure that the project will not have any significant adverse visual impacts on the locality.

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1 Introduction

1.1 Overview

UPC Renewables Australia Pty Ltd (UPC) proposes to develop the New England Solar Farm; 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) (Figure 1.1) (the project).

The project is a State Significant Development (SSD) under the State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP). Therefore, a development application (DA) for the project is required to be submitted under Part 4, Division 4.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The NSW Minister for Planning (Minister), or the Minister's delegate, is the consent authority.

An environmental impact statement (EIS) is a requirement of the approval process. This visual impact assessment (VIA) report forms part of the EIS. It documents the VIA methods and results, the initiatives built into the project design to avoid and minimise visual amenity impacts, and the additional mitigation and management measures proposed to address any residual impacts not able to be avoided.

1.2 Project description

The project involves the development, construction 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 provided on Figure 1.2 incorporates the land required for:

- the three solar array areas;
- up to three internal solar array substations and a single grid substation;
- 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 three array areas (including electricity transmission lines (ETLs) and underground or overhead cabling); and
- a new internal road network to enable access from surrounding local roads to the three 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 800 MW (AC) and up to 200 MW (AC) two-hour energy storage. The final number of PV modules within the three 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 to TransGrid's 330 kV transmission line that traverses the northern and central array areas (refer Figure 1.2). Further details about the proposed network connection are provided in Section 4.3.3.

The infrastructure associated with the project will cover an area within the development footprint (Figure 1.2). During the preparation of the EIS, the development footprint within the project boundary has been refined on the basis of environmental constraints identification, stakeholder engagement, community consultation and design of project infrastructure with the objective of developing an efficient project that avoids and minimises environmental impacts.

1.3 Assessment guidelines and requirements

This VIA has been prepared in accordance with the relevant governmental assessment requirements, guidelines and policies, and in consultation with the relevant government agencies.

There are no Commonwealth, NSW or local government planning policies, guidelines or standards directly applicable to this assessment. The VIA was prepared with reference to the methods outlined in:

- *Guidelines for Landscape and Visual Impact Assessment Third Edition* (2013) (the GLVIA), prepared by the Landscape Institute and Institute of Environmental Management and Assessment; and
- *Wind Energy: Visual Assessment Bulletin AB 01 For State significant wind energy development* (2016a) prepared by the NSW Department of Planning and Environment (the VA Bulletin).

It is noted that the VA Bulletin specifically relates to assessment of visual impacts of wind farms in NSW; however, a number of the methods for describing visual sensitivity and landscape character are considered to be relevant to this assessment. In the absence of other directly applicable guidelines/standards, the relevant elements from the VA Bulletin have been adopted for this assessment.

The draft *Large-Scale Solar Energy Guideline for State Significant Development* (the draft guideline) was released by the NSW Government in 2017 and provides the community, industry, applicants and regulators with guidance on the planning framework for the assessment and approval of large-scale solar energy development proposals under the EP&A Act, which are classified as SSD.

The acceptability of visual impacts, namely impacts on landscape character and values and the amenity of landholders and communities, along with the adequacy of the measures that are proposed to avoid, reduce or otherwise manage these impacts, are identified as key assessment issues within the draft guideline and have been considered in detail within this VIA.

The draft guideline also recommends consideration of cumulative impacts from other developments (proposed, approved and operating), including potential visual impacts where multiple solar developments may be constructed in close proximity to each other. Cumulative impacts of the project are discussed further in Section 5.6.

This VIA was prepared in accordance with the requirements of the NSW Department of Planning and Environment (DPE), which were set out in the Secretary's Environmental Assessment Requirements (SEARs) for the project, issued on 8 May 2018. The SEARs identify matters that must be addressed in the EIS.

Revised SEARs were issued for the project on 11 October 2018 in response to UPC's request for a revision to the project description to include a temporary construction accommodation village (should it be required).

A copy of the revised SEARs is attached to the EIS as Appendix A, while Table 1.1 lists the individual requirements relevant to this VIA and where they are addressed in this report.

Table 1.1 Relevant SEARs

Requirement	Section addressed
Visual – including an assessment of the likely visual impacts of the development (including any glare, reflectivity and night lighting) on surrounding residences (including the Sunhill Dairy Goats property), scenic or significant vistas, air traffic and road corridors in the public domain, including a draft landscaping plan for on-site perimeter planting with evidence it has been developed in consultation with affected landowners.	Chapter 5 Impacts on Sunhill Dairy Goats Property (S9) assessed as part of consideration of Viewpoint 2. Draft landscaping plan for S9 provided in Figure 4.2.

To inform preparation of the SEARs, DPE invited other government agencies to recommend matters to be addressed in the EIS. These matters were taken into account by the Secretary for DPE when preparing the SEARs. Copies of the government agencies' advice to DPE were attached to the SEARs.

NSW Roads and Maritime Services (RMS) and NSW Department of Primary Industries – Agriculture (DPI Agriculture) raised matters relevant to the VIA. The matters raised are listed in Table 1.2.

Table 1.2 Government agencies comments: assessment recommendations

Requirement	Section addressed
RMS Consideration of potential glare/reflectivity generated from on-site infrastructure towards public roads.	Section 5.4
DPI Agriculture Complete a Land Use Conflict Risk Assessment, including: Identification of potential land use conflict, in particular relating to separation distances and management practices to minimise dust, noise and visual impacts from sensitive receptors.	Measures to mitigate visual impacts provided in Section 4.5.

As part of the project's stakeholder engagement strategy, UPC has consulted with a number of the project's neighbouring landholders and, more generally, the local community. This VIA responds to a number of the matters raised during this engagement, including:

- potential visibility of project infrastructure from neighbouring residences and the local road network (Chapter 5);
- potential for glare and reflectivity from PV modules (Section 5.4);
- potential for night lighting impacts from project infrastructure (Section 4.5.3); and
- adequacy of any proposed vegetation screening (Section 4.5.1).

1.4 Structure of the report

This report is structured as follows:

- Chapter 2 describes the VIA methodology adopted in the preparation of this report;
- Chapter 3 describes the existing landscape within which the project will be sited;
- Chapter 4 describes the character of the visual components of the project and the staging of project development;
- Chapter 5 describes the impacts of the project from representative viewpoints in and around the site; and
- Chapter 6 provides conclusions.

Source: EMM (2018); DFSI (2017); GA (2015)

0 10 20 km

GDA 1994 MGA Zone 56

N

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KEY

- Development footprint
- Project boundary
- Other SSD solar development
- Airport
- Rail line
- Main road
- Local road
- Watercourse/drainage line
- Waterbody
- Local government area
- NPWS reserve
- State forest

Regional context

New England Solar Farm
Visual impact statement
Figure 1.1

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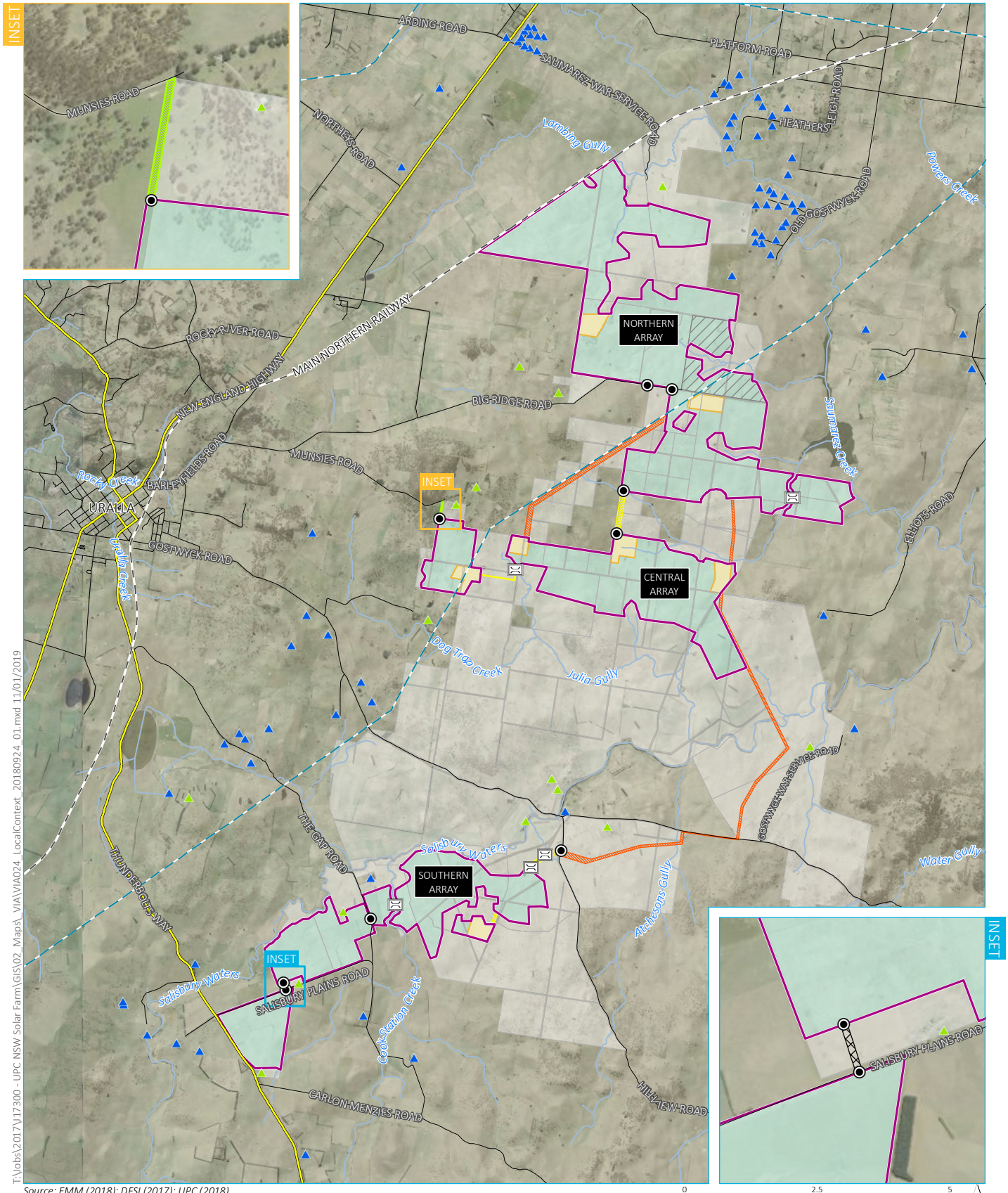

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Source: EMM (2018); DFSI (2017); UPC (2018)

0 2.5 5 km

GDA 1994 MGA Zone 56

N

KEY

- 330 kV transmission line
- Rail line
- Main road
- Local road
- Watercourse/drainage line
- Project boundary

Development footprint

- Solar array
- Potential ETL easement
- Potential site access corridor
- Potential site access/ETL easement
- Potential substation/BESS footprint
- Potential electrical cabling/site access corridor
- Potential creek crossing
- Potential site for construction accommodation village
- Proposed primary site access point

Sensitive receptors

- Project-related
- Non-project related

Location of the New England Solar Farm

New England Solar Farm
Visual impact assessment
Figure1.2

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2 Assessment methodology

2.1 Overview

The assessment method used in this report is that outlined in the GLVIA and VA Bulletin, which involves information review, consultation, field observations and photography, computer-based data processing and analysis, and application of subjective professional judgement. The assessment involved seven key stages:

Stage 1: **View type and context** – the existing landscape baseline is described noting its character and complexity;

Stage 2: **Visibility baseline assessment** – the zone of visual influence of the project is established, where appropriate, through the use of computer generated zones of theoretical visibility, based on topographical data, or through fieldwork analysis. This establishes the locations where views of the project may be possible. Fieldwork is undertaken to establish the types and locations of receptors within this theoretical zone;

Stage 3: **Viewpoint selection** – representative public and private viewpoints of the site are selected and the project's level of exposure to them is determined;

Stage 4: **Magnitude of change** - the magnitude of visual change and the changes arising from the project are assessed and the need for project modifications or other mitigation measures evaluated;

Stage 5: **Visual sensitivity** – the capacity of the landscape to absorb change without a loss of quality (its visual sensitivity) is determined;

Stage 6: **Evaluation of significance** – the significance of change in the landscape is a function of the magnitude of change when considered against the view type/context and the sensitivity of a receptor; and

Stage 7: **Mitigation** – the modified and mitigated project (if applicable) is assessed, the final visual impacts are described and illustrated and their significance documented.

Details of each of the above stages are provided below.

In addition to each of the stages described above, the project refinement process (described in Section 4.1 of this report and Section 1.4 of the EIS) has also responded to identified potential visual impacts from the project. Subsequently, consideration of the effect of project refinement on potential for visual impacts to be experienced at each of the selected viewpoints has been provided in Section 5.3 of this report.

2.2 Stages in the assessment methodology

2.2.1 Stage 1 – View type and context

This stage involves recording and analysis of existing landscape features, characteristics, the way in which the landscape is experienced, and the value or importance of the landscape and visual resource in the site. The landscape character is determined by the number, size, type and contrast of elements present. Typically the key elements are topography, vegetation, water features and built elements. Other factors that are important are the consistency of these elements and whether they have developed progressively over time and become well integrated into a harmonious landscape. In addition, consideration must be given to the prevalence of change, including whether the landscape is experiencing large-scale development (such as residential growth on the urban fringe).

The context is a primary factor in the visual sensitivity of the view. Generally sites within higher contrasting landscapes have greater ability to absorb change, whereas sites within a uniform or highly ordered landscape have higher sensitivity and less potential for absorption.

Reference has been made to the landscape characters defined in the VA Bulletin and descriptions provided in the Interim Biogeographic Regionalisation for Australia (IBRA) (Thackway and Cresswell 1995). The GLVIA also sets out guidance in relation to landscape baseline at paragraph 5.3:

> Baseline studies for assessing landscape effects require a mix of desk study and fieldwork to identify and record the character of the landscape and the elements, features and aesthetic and perceptual factors which contribute to it. They should also deal with the value attached to the landscape....The methods used should be appropriate to the context into which the development proposal will be introduced and in line with current guidance and terminology.

2.2.2 Stage 2 – Visibility baseline assessment

Baseline studies for visual effects establish the area in which the project may be visible, who will see the project infrastructure, the viewpoints that will be affected and the nature of the views at those points. Viewshed analysis using GIS has been used to simulate visibility from viewpoints and the surrounding landscape.

2.2.3 Stage 3 – Viewpoint selection

Viewpoints are selected to provide a representative sample of the likely visual landscape changes on the different users of the areas surrounding the project and their visual exposure to various project elements. Viewpoints that are considered to have potential exposure to various project elements or areas available to public access, such as roads, and private viewpoints from residential properties surrounding the project, have been identified through GIS mapping, fieldwork, stakeholder engagement and desktop analysis.

As well as informing the project refinement process described in Section 4.1, feedback received from neighbouring landholders and the local community as part of stakeholder engagement activities has also informed the selection of the 19 viewpoints described in Section 5.1. The viewpoints presented as part of this report are considered representative of potential visual impacts from a number of the locations identified as areas of concern by the local community, including local roads and private viewpoints from residential properties.

2.2.4 Stage 4 – Magnitude of change

The magnitude of change on the visual landscape is one factor in determining the significance of visual impacts of the project. In accordance with the GLVIA, this visual assessment considered the following criteria in determining the magnitude of change on a receptor:

- whether the impact is temporary or permanent – impacts that are for a limited duration are considered less significant than those that occur for an extended period or are permanent;
- scale of change – the loss or addition of features in the view and changes in the proportion of the view affected by the project;
- degree of contrast – level of integration of new features with existing or remaining landscape elements, having regard to form, scale, height, colour, and texture;
- distance of the viewer from the altered elements in the landscape – close proximity to an altered landscape will increase the significance for private residences. In the case of motorists, mid ground changes can be greater than foreground elements as they can result in longer viewing times. Glare and reflection has also been considered in regards to motorists;
- viewing direction – whether the change is to the primary view from the receptor;
- extent of view affected – impacts that are visible over a greater portion of a view are more significant than those where only a part of the view is impacted. Intervening topography and vegetation will also affect the magnitude of change; and
- length of viewing time – views from a residence are constant, whereas some views from roadways as experienced by motorists may be brief dependent upon speed and viewing direction.

2.2.5 Stage 5 – Visual sensitivity

Visual sensitivity is a measure of the landscape's ability to absorb development without a significant change in the character. It is a function of the view type and context. In this assessment, the major factor influencing visual sensitivity is the level of contrast between the project-related infrastructure and the rural landscape setting in which it will be set.

The physical characteristics of the landscape, including existing development features, are integral components in determining the visual sensitivity. For example, a low visual sensitivity would enable a modification or addition to be made to the landscape which would only cause minimal contrast and result in a high level of integration with the surrounding landscape. Similarly, a high visual sensitivity would mean the same modification or addition to the surrounding landscape would cause high contrast to the surrounding landscape.

Visual sensitivity has been assessed based on the viewer sensitivity level classification given in the VA Bulletin, presented in Table 2.1.

Table 2.1 Viewer sensitivity level classification

Sensitivity	Description
High	Residential areas and rural villages (defined as land zoned R1, R2, R3, R4, R5 and RU5 in the Standard Instrument Local Environmental Plan [LEP]).
	Recreation, cultural or scenic sites and viewpoints of National or State significance.
	Any buildings, historic rural homesteads/residences on the State or local Government Heritage List.
Moderate	Rural dwelling(s).
	Tourist and visitor accommodation (definition in Standard Instrument LEP).
	Recreation, cultural or scenic sites and viewpoints of regional significance.
Low	Interstate and state passenger rail lines with daily daylight services.
	State highways, freeways and classified main roads, classified tourist roads.
	Land management roads with occasional recreation traffic.
	Walking tracks of moderate local significance or infrequent recreation usage.
	Other low use and low concern viewpoints and travel routes.
	Navigable waterways.

The VA Bulletin establishes sensitive land use designations, including key National and State sensitive land use designations, along with potentially sensitive land use zones in the local environmental plans prepared under the EP&A Act. These National and State sensitive land use designations and land use zones are identified in Table 2.2.

Table 2.2 Sensitive land use designations

National and State sensitive land use designations	LEP zones as per the NSW Standard LEP	
World Heritage Areas	RU5 Village	RE2 Private Recreation
National Parks	R1 General Residential	E1 National Parks and Nature Reserves
National Reserve System reserves	R2 Low Density Residential	E2 Environmental Conservation
Coastal Zone (under the NSW *Coastal Protection Act 1979*)	R3 Medium Density Residential	E3 Environmental Management
Marine estate (under the NSW *Marine Estate Management Act 2014)*	R4 High Density Residential	E4 Environmental Living
Commonwealth Heritage List Sites	R5 Large Lot Residential	W1 Natural Waterways
State Heritage Register Sites	SP3 Tourist	W2 Recreational Waterways

Source: Table 3 from VA Bulletin (DPE 2016a).

The development footprint is not located within a sensitive land use designation or within a potentially sensitive land use zone. The nearest sensitive land use zone is approximately 2.9 km north-east of the northern array area and is zoned R5 Large Lot Residential under the Uralla Local Environmental Plan 2012 (Uralla LEP) (refer to Figure 3.1). There is also a parcel of land zoned E4 Environmental Living under the Uralla LEP approximately 3 km west of the central array area (refer to Figure 3.1).

Schedule 5 of the Uralla LEP lists a number of heritage items within the Uralla Shire LGA, including three items within proximity of the development footprint for the three array areas, namely Gostwyck Memorial Chapel and Precinct (Uralla LEP listing I10), Salisbury Court (Uralla LEP listing I14) and Deeargee Woolshed (Uralla LEP listing I11) (refer Figures 5.3 and 5.4). Further information on these heritage items is provided in Section 3.2 and potential visual impacts on each item have been assessed in Chapter 5.

2.2.6 Stage 6 – Evaluation of significance

The significance of a change in the landscape is a function of the magnitude of that change when considered against the view type/context and the sensitivity of a receptor. Typically, a noticeable change in the landscape in a rural or natural landscape, combined with a high visual sensitivity, would be considered to be significant, whereas a change in an already heavily modified landscape would be considered slight or moderate.

Table 2.3 illustrates how the magnitude of a change in the landscape is assessed, and its significance, rated against the sensitivity of a viewpoint.

Table 2.3 Evaluation of significance matrix

Magnitude of change	Visual sensitivity		
	High	**Moderate**	**Low**
High	Substantial	Moderate/ Substantial	Moderate
Moderate	Moderate/ Substantial	Moderate	Slight/ Moderate
Low	Moderate	Slight/ Moderate	Slight
Negligible	Slight	Slight	Negligible

Key: Significant Not significant

The primary assessment tools for determining the significance of impact of the project were the site inspections and photographs of the views from the selected viewpoints. This enabled an assessment of potential visual impact, taking into consideration the nature of the landscape, topography, the distance between the viewpoint and the proposed infrastructure, as well as the type of view experienced.

2.2.7 Stage 7 – Mitigation

As noted in Section 2.1, the project refinement process (described in Section 4.1 of this report and Section 1.4 of the EIS) responded to identified potential visual impacts from the project. Refinements to the northern and southern array area in particular have eliminated potential visual impacts from the project at a number of different locations.

The final step in the assessment process was to determine additional measures that could be incorporated into the design of the project to ameliorate, or, where possible, eliminate the visual impact of the project.

Mitigation measures can be in several forms including:

- design of project infrastructure to reduce the contrast with the surrounding environment;
- use of visual buffers and screening by planting vegetation (where required); and
- designing infrastructure to screen operations and lighting.

Mitigation measures that have been incorporated into the design of the project are discussed in Section 4.5 of this report.

3 Site description

3.1 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 (refer to Figure 1.1).

The project boundary, which is defined as the entirety of all of the involved lots, encompasses a total area of 8,380 ha. The project boundary encompasses 61 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 development footprint is the area within the project boundary on which infrastructure will be located. The development footprint encompasses a total area of 2,787 ha, which includes 1,418 ha within the northern array area, 625 ha within the central array area and 653 ha within the southern array area.

Within the development footprint, approximately 1,000 ha will be required for the rows of PV modules. The remaining area is 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 three array areas as well as land required for new internal roads to enable access to the three 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.

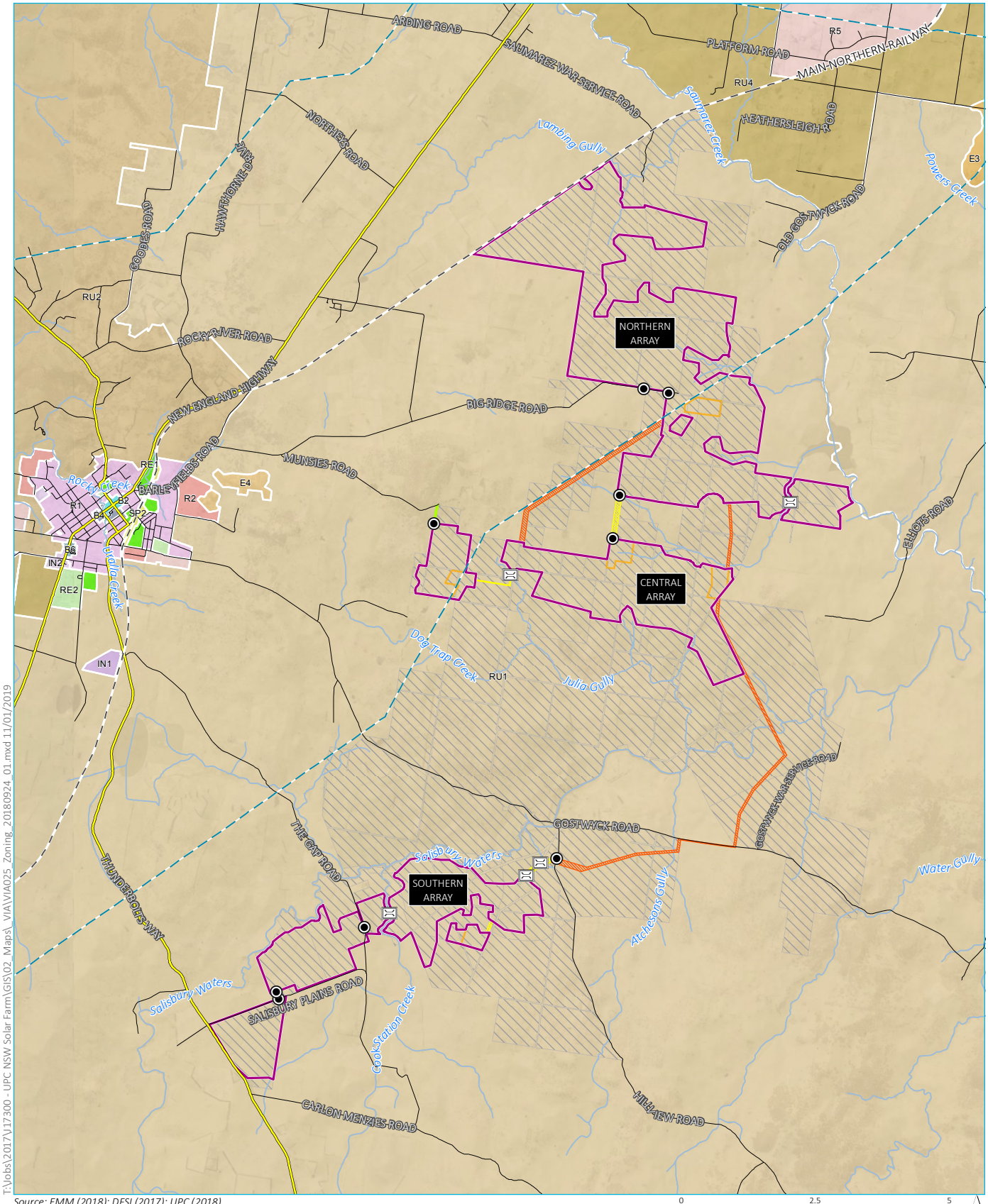
The land within the project boundary is zoned RU1 Primary Production under the Uralla LEP (Figure 3.1). The properties within the project boundary are currently primarily used for sheep grazing for production of wool and lambs, with some cattle grazing for beef production.

The project is ideally located close to Transgrid's 330 kilovolt (kV) transmission line, which passes through the northern and central array areas (Figure 1.2). It also has access to the regional road network; including the New England Highway and Thunderbolts Way (Figure 1.2).

A number of local roads traverse the array areas and their surrounds, including Gostwyck Road, Salisbury Plains Road, The Gap Road, Carlon Menzies Road, Munsies Road, Saumarez War Service Road, Hillview Road, Elliots Road and Big Ridge Road, and will provide access to the three array areas from the regional road network throughout the construction and operation of the project (Figure 1.2).

The primary site access points will be from The Gap Road, Salisbury Plains Road, Hillview Road, Munsies Road and Big Ridge Road (Figure 1.2). Emergency access points may also be required.

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 above sea level (MASL).



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Source: EMM (2018); DFSI (2017); UPC (2018)

0 2.5 5 km

GDA 1994 MGA Zone 56

N

KEY

- 330 kV transmission line
- Rail line
- Main road
- Local road
- Watercourse/drainage line
- Proposed primary site access point
- Project boundary

Development footprint

- Solar array
- Potential ETL easement
- Potential site access corridor
- Potential site access/ETL easement
- Potential electrical cabling/site access corridor
- Potential substation/BESS footprint
- Potential creek crossing

Land zoning *(Uralla LEP)*

- B2 Local Centre
- B4 Mixed Use
- B6 Enterprise Corridor
- E3 Environmental Management
- E4 Environmental Living
- IN1 General Industrial
- IN2 Light Industrial
- R1 General Residential
- R2 Low Density Residential
- R5 Large Lot Residential
- RE1 Public Recreation
- RE2 Private Recreation
- RU1 Primary Production
- RU2 Rural Landscape
- RU4 Primary Production Small Lots
- SP2 Infrastructure

Land use zoning

New England Solar Farm
Visual impact assessment
Figure 3.1

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3.2 Surrounding land uses

The project's development footprint is in a semi-rural setting, with the wider region characterised by large grazing properties, small-scale farm businesses, natural areas, scattered rural dwellings, villages and towns (including Uralla, Kellys Plains, and Armidale) and major transport infrastructure including the Main Northern Railway and New England Highway.

The majority of the land surrounding the project boundary is zoned RU1 primary production under the Uralla LEP (Figure 3.1). Land uses surrounding the three 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.

Schedule 5 of the Uralla LEP lists a number of heritage items within the Uralla Shire LGA, including three items within proximity of the development footprint for the three array areas, namely Gostwyck Memorial Chapel and Precinct (Uralla LEP listing I10), Salisbury Court (Uralla LEP listing I14) and Deeargee Woolshed (Uralla LEP listing I11) (refer Figures 5.3 and 5.4).

The property description for Gostwyck Memorial Chapel and Precinct within the Uralla LEP is listed as Lot 1 of DP 227322 (ie Gostwyck Station) and subsequently, the polygon provided in Figure 5.4 makes up the listing provided under Schedule 5 of the Uralla LEP. Figure 5.4 also presents the indicative boundary of the structures that make up the precinct and the location of Gostwyck Memorial Chapel itself (ie Viewpoint 7). At its closest point, the development footprint for the southern array area is approximately 1.1 km from Gostwyck Memorial Chapel.

The property description for Salisbury Court within the Uralla LEP is listed as Lot 1 of DP 1030870 and subsequently, the polygon provided in Figure 5.4 makes up the listing. At its closest point, the development footprint for the southern array area is approximately 900 m from Salisbury Court homestead (referred to as sensitive receptor S16). Sensitive receptors (ie dwellings) within proximity of the three arrays have been assigned a label based on their proximity to the three array areas (ie S for southern, C for central and N for northern). Salisbury Court homestead (S16) is currently occupied and has therefore been considered as both a sensitive receptor and an item of heritage significance.

The property description for Deeargee Woolshed within the Uralla LEP is listed as Lot 3 of DP 1122757 and subsequently, the polygon provided in Figure 5.4 makes up the listing. At its closest point, the development footprint for the southern array area is approximately 970 m from Deeargee Woolshed.

Gostwyck Memorial Chapel and Precinct, Salisbury Court and Deeargee Woolshed are recognised as places of local environmental heritage significance within the Uralla LEP. One of the objectives of the Uralla LEP is:

> to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views.

Views of project infrastructure from Gostwyck Memorial Chapel and Precinct (Viewpoint 7), Salisbury Court (Viewpoint 13) and Deeargee Woolshed (Viewpoint 8) have been considered as part of this VIA.

The historic heritage assessment and statement of heritage impact (Appendix E of the EIS) provides further consideration of these heritage items. The assessment also includes consideration of the cultural landscape within the project boundary and its surrounds. As noted within the assessment, the aesthetic significance of the cultural landscape within the project boundary is apparent to the viewer as it retains many of the forms that existed in the earliest days of settler occupation. Visually, the land within the project boundary and its surrounds retains the rural character of the area and has features associated with both Aboriginal cultural and historical heritage values.

No listed scenic or significant vistas within proximity of the project boundary have been identified.

Oxley Wild Rivers National Park is approximately 20 km east of the site at its closest point and covers approximately 1,452 km^2.

3.3 Electricity transmission infrastructure

ETL infrastructure traverses the project boundary and includes:

- TransGrid's existing 330 kV transmission line between Armidale and Tamworth, which passes through the northern and central array areas (refer Figure 1.2);
- Essential Energy's existing 66 kV sub-transmission line between Armidale and Walcha/Uralla tee, which runs east-west to the north of the southern array area (refer Figure 1.2); and
- a number of Essential Energy 11 kV local supply lines.

Electricity generated by the project will be injected into the grid via a new cut-in to TransGrid's 330 kV transmission line.

3.4 Rural dwellings

A number of non-project related dwellings have been identified in the landscape surrounding the project boundary and, more specifically, the three array areas. Non-project related dwellings considered as part of this assessment are identified on Figures 5.1 to 5.4, as well as the figures presented in Appendix A of this report, and include:

- approximately 40 dwellings within 4 km of the northern array area, including dwellings on:
    - Corey Road, Hariet Gully Road, Old Gostwyck Road, Heathersleigh Road, Burns Road and Stoneleigh Road within the suburb of Kellys Plains;
    - Coxs Road and Elliots Road within the suburb of Dangarsleigh;
    - Kellys Plains Road within the suburb of Armidale;
    - Arding Road within the suburb of Arding; and
    - Saumarez War Service Road, Tuberosa Road and Rosetta Court within the suburb of Saumarez;

- six dwellings within 2 km of the central array area, including dwellings on:
    - Gostwyck Road within the suburb of Uralla;
    - Elliots Road within the suburb of Dangarsleigh; and
    - Gostwyck War Service Road within the suburb of Gostwyck;
- approximately 20 dwellings within 4.5 km of the southern array area, including dwellings on:
    - The Gap Road, Sanctuary Drive, Thunderbolts Way, Gostwyck Road and Talisker Road within the suburb of Uralla;
    - Gostwyck Road within the suburb of Gostwyck; and
    - The Gap Road, Salisbury Plains Road and Thunderbolts Way within the suburb of Salisbury Plains.

A key consideration of the project refinement process has been potential visibility of project infrastructure from the identified rural dwellings. Significant revisions to the southern and northern array areas have been performed to increase the distance between the development footprint and non-project related rural dwellings and therefore reduce potential visibility of project infrastructure (refer Section 4.1 and Figure 4.1).

Two rural dwellings owned by project landholders have also been considered as part of this assessment as they are currently leased to members of the local community, namely S11 (Viewpoint 1) and N40 (Viewpoint 6) (refer Figure 5.4 and Figure 5.2, respectively). With the exception of these two dwellings, no project-related dwellings have been considered as part of this assessment.

3.5 Settlements and townships

Uralla is the largest township in the Uralla Shire LGA, with a population of 2,743. It is also the Uralla Shire LGA's commercial and administrative centre. The town is approximately 6 km west of the project boundary (Figure 1.2). There are a range of retail, commercial, professional and personal services available within the town, as well as a number of short-term accommodation options. The majority of businesses within the Uralla Shire LGA are associated with agriculture, forestry and fishing, which contribute to more than $100 million or 25% of the Uralla Shire LGA's gross regional product.

In addition to Uralla, a number of small villages also surround the three array areas, including Kellys Plains and Saumarez (north of the northern array area); Gostwyck and Dangarsleigh (east and south of the central array area, respectively); and Salisbury Plains (south of the southern array area).

The regional city of Armidale is approximately 8.6 km north of the northern array area.

3.6 Traffic routes

The three array areas have suitable access to the regional road network; including the New England Highway and Thunderbolts Way (refer Figure 1.2). A number of local roads traverse the area surrounding the three arrays, including Gostwyck Road; Salisbury Plains Road; The Gap Road; Carlon Menzies Road; Munsies Road; Saumarez War Service Road; Hillview Road; Elliots Road and Big Ridge Road, and will provide access to the three array areas from the regional road network throughout the construction and operation of the project (Figure 1.2).

The primary site access points will be from The Gap Road, Salisbury Plains Road, Hillview Road, Munsies Road and Big Ridge Road (Figure 1.2). Emergency access points may also be required.

A number of local and regional roads have been considered as part of this VIA as motorists travelling along these road corridors may have views of the project infrastructure. This includes Thunderbolts Way (Viewpoint 12 and Viewpoint 13), the New England Highway (Viewpoint 14), Salisbury Plains Road (Viewpoint 13), Saumarez War Service Road (Viewpoint 15), Elliots Road (Viewpoint 11), Hillview Road (Viewpoint 8), Gostwyck War Service Road (Viewpoint 10) and Gostwyck Road (Viewpoint 9). As part of the site inspections, observations were made from the three array areas towards each of these road corridors.

In addition, views from Burns Road (Viewpoint 16), Heathersleigh Road (Viewpoint 17), Hariet Gully Road (Viewpoint 18) and Corey Road (Viewpoint 19), north of the northern array area have also been considered as part of this VIA.

Views of project infrastructure from Big Ridge Road and Munsies Road (refer Figure 1.2) have not been considered as part of this VIA. Within proximity of the development footprint for the northern and central array areas, the primary users of these road corridors are considered to be project landholders.

The Main Northern Railway is adjacent to the northern array area's northern boundary.

3.7 Air traffic

Armidale Airport is approximately 5.4 km north of the project boundary (refer Figure 1.1). Based on the findings of previous assessments prepared for PV solar energy facilities, glint and glare from the project's PV modules and other project infrastructure are not expected to significantly impact aircraft arriving at or departing from Armidale Airport (refer Section 5.4).

3.8 Night lighting

Existing sources of night lighting in the immediate vicinity of the three array areas are minimal due to its rural setting. The main sources of lighting would be from rural residential dwellings, farm machinery and vehicles on roads.

The project will require limited permanent night lighting, most likely for the O&M buildings and substations. Temporary, localised night lighting may be required during general maintenance activities conducted during the operation stage of the project. If required, lighting will be managed to minimise impacts on surrounding areas (refer Section 4.5.3).

3.9 Other developments

Neoen Australia Pty Ltd (Neoen) is seeking to develop the Uralla Solar Farm (SSD 18_9534) within the Uralla Shire LGA, approximately 4.9 km north-west of the project. SEARs for the Uralla Solar Farm were not available at the time of writing; however, based on the information provided within the PEA, it is understood that if constructed, the proposed Uralla Solar Farm would cover an area of up to 1,800 ha and have a targeted capacity of around 400 MWac (GHD 2018). The proposed site for the Uralla Solar Farm is identified on Figure 1.1. Consideration of potential cumulative impacts from the project and the Uralla Solar Farm is provided in Section 5.6 of this report.

Based on a review of DPE's Major Projects register and consultation with both Armidale Regional Council and Uralla Shire Council, it is understood that there are a number of other projects likely to be constructed within close proximity of the township of Uralla and the three array areas. These projects are concentrated in the Armidale LGA and include:

- Tilbuster Solar Farm (SSD 18_9619) – Enerparc proposes to develop the Tilbuster Solar Farm, a 300 MW PV solar farm, within the Armidale Regional LGA, approximately 22 km north of the project;

- Metz Solar Farm (SSD 16_7931) – Clenergy proposes to develop a 100 MW PV solar farm at Metz, approximately 18 km east of Armidale (Figure 1.1) – the project was approved by the Minister for Planning on 18 July 2017;

- Armidale High School's redevelopment – a proposed redevelopment of the existing high school to establish a new, purpose-built high school with a capacity of approximately 1,580 students;

- continued expansion of UNE's Armidale campus to accommodate additional colleges and a small-scale solar farm (including construction of the Wright Block – three new residential blocks and associated infrastructure);

- Armidale Regional Airport's industrial park development, which will include a multi-purpose commercial land development, a business park, highway service centre and fully-serviced aviation related lots; and

- sustained upgrades to Armidale Regional Airport.

4 Visual elements of the project

4.1 Site selection and project refinement

UPC identified the New England region as a suitable location for the project as other regions with favourable characteristics for large-scale solar projects (eg the Riverina region of south-west NSW or areas of central NSW) have already experienced a significant level of solar development with a number of approved projects and projects under development and construction. This increases the risks relating to grid connection and power evacuation when compared with the New England region, where relatively limited large-scale solar development has taken place to date.

The site selection and refinement process has considered a range of factors, including:

- availability of solar radiation;
- proximity to, and capacity of the electricity grid;
- availability of sufficient land area with suitable physical characteristics;
- identification and avoidance of environmental constraints; and
- placement of infrastructure to minimise land use conflicts with landholders.

Since the submission of the preliminary environmental assessment (PEA), the design and location of the development footprint within the project boundary has undergone a number of significant revisions in response to ongoing stakeholder engagement, environmental constraints identification and engineering assessment. Throughout the project refinement process, UPC has made considerable effort to avoid potential environmental impacts, where possible.

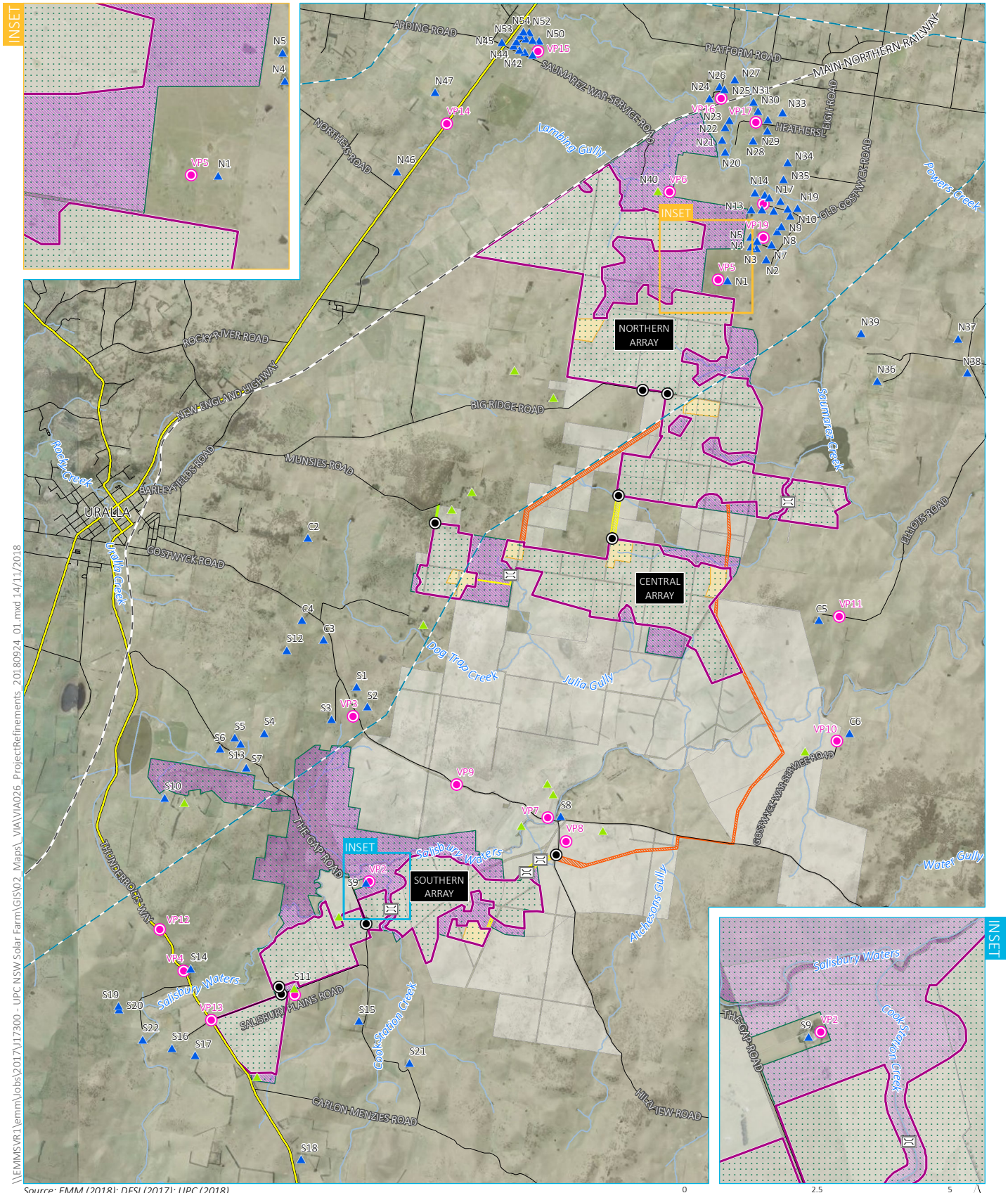
One of the primary design principles adopted by UPC during the refinement process has been to minimise direct and indirect impacts on non-project related receptors and neighbouring agricultural operations. This has led to significant revisions to the extent of the northern and southern array areas. A comparison between the site boundary presented as part of the PEA and the development footprint assessed as part of this VIA is provided in Figure 4.1.

In response to feedback received from neighbouring landholders and the local community during targeted engagement, significant revisions have been performed to greatly reduce the extent of the southern array area. This has increased the distance between a number of receptors and the development footprint for the southern array area, which has subsequently reduced the significance of visual amenity impacts on a number of receptors, including: S1, S2, S3, S4, S5, S6, S7, S9, S10, S12 and S13 (Figure 4.1). As part of this refinement process, an area of approximately 585 ha north of Salisbury Waters has been excluded from the development footprint for the southern array area. In addition, approximately 40 ha of land south of Salisbury Waters, adjacent to S9 has also been excluded from the southern array area. This exclusion has increased the buffer between S9 and the development footprint for the southern array area from approximately 50 m (as presented as part of the PEA) to approximately 240 m and has also restricted the placement of project infrastructure to the east and south of S9 (Figure 4.1).

In addition, due to proximity to residences along Heathersleigh Road, Corey Road, Burns Road and Hariet Gully Road, the results of a preliminary viewshed analysis and targeted engagement with N1, significant revisions have also been made to the northern extent of the northern array area to increase the distance between the development footprint and neighbouring residences (Figure 4.1). As part of this refinement, an area of approximately 315 ha has been excluded from the development footprint for the northern array area.

The proposed ETL alignment to connect the southern and central array areas (refer to Figure 1.2) has also been refined as a result of engagement with a number of residents on The Gap Road and Gostwyck Road who raised concerns over the ETL alignment presented as part of the PEA. The proposed ETL alignment now traverses land along the eastern side of the project boundary and will not be visible from these residences (refer to Figure 1.2).

Further to the significant refinements performed to date, as part of the detailed design stage of the project, project infrastructure including substations and BESSs will be positioned within the development footprint with a view to minimising or avoiding visual amenity impacts on nearby residences where practicable.



\\EMMSVR1\emm\Jobs\2017\17300 - UPC NSW Solar Farm\GIS\02_Maps_VIA\VIA026_ProjectRefinements_20180924_01.mxd 14/11/2018

Source: EMM (2018); DFSI (2017); UPC (2018)

0 2.5 5 km

GDA 1994 MGA Zone 56

N

KEY

- 330 kV transmission line
- Rail line
- Main road
- Local road
- Watercourse/drainage line
- Site boundary presented as part of the PEA
- Areas to exclude project infrastructure
- Project boundary

Development footprint

- Solar array
- Potential ETL easement
- Potential site access corridor
- Potential site access/ETL easement
- Potential substation/BESS footprint
- Potential creek crossing

- Viewpoint location
- Proposed primary site access point

Sensitive receptors

- Project-related
- Non-project related

Project refinements to avoid potential visual impacts

New England Solar Farm
Visual impact assessment
Figure 4.1

EMM
creating opportunities

4.2 Construction

4.2.1 Site preparation

The need for heavy civil works such as grading/levelling and compaction will be minimised, as the flattest land areas within the three array, areas which are already mostly cleared of vegetation, have been selected for infrastructure placement. Civil works will be required to prepare the three array areas, including fencing installation, construction of internal access tracks, and minor earth works.

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 introduced 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;
  - parking areas; and
  - temporary laydown areas.
- construction of access tracks and installation of boundary fencing;
- site survey to confirm infrastructure positioning and placement; and
- geotechnical investigations to confirm the ground condition.

4.2.2 Construction activities

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

- drive piles;
- install mounting structures and tracker tubes;
- secure PV modules to tracker tubes;
- install medium voltage and high voltage cables;

- install PCUs;
- complete substation augmentation;
- establish the BESS compound; and
- test and commission project infrastructure.

A construction accommodation village for non-local construction employees (where skills cannot be sourced locally) may also be established as part of the early stages of the project's construction (refer Figure 1.2).

Construction of the project will take approximately 36 months from the commencement of site establishment works to commissioning of the three array areas.

4.3 Project infrastructure

4.3.1 Solar arrays, PV modules, medium voltage cable network and power conversion units

The project will involve the development of three 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.

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 three array areas. The modules will be fixed to, and supported by, a ground-mounted framing structure, aligned in rows. Assuming single axis tracking technology is used, 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 4.1.

Photograph 4.1 PV module row with single axis tracking technology (Source: NexTracker 2018)

An alternative configuration for the PV modules may be considered for the project, 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.

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.

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 4.1. This configuration features four PV modules in landscape orientation, or alternatively, two PV modules in portrait formation. The most typical configuration using single axis tracking technology is currently a single PV module mounted on the tracker tube in portrait (refer to Photograph 4.1 and Option B of Plate 4.1). Should this configuration be selected, the height of the PV modules at their maximum tilt angle would likely be closer to 2-3 m.

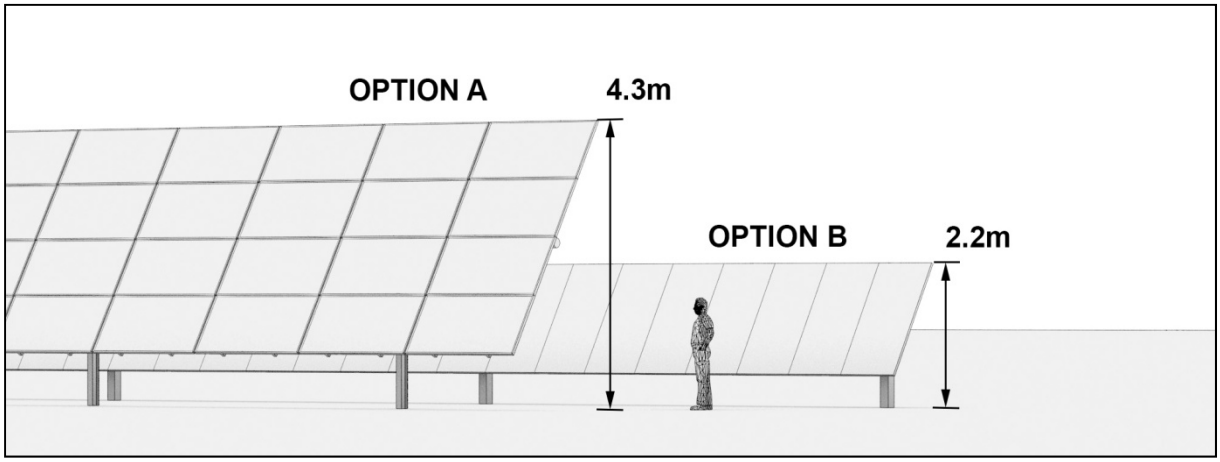


Plate 4.1 Example of PV module configurations under consideration for the project

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 4.2 has been provided as an example of what the PCUs and inverters may look like within the development footprint for the three array areas. The exact configuration (indoor/containerised as shown in Photograph 4.2 or an outdoor/skid-mounted configuration not shown), make and model to be installed will be determined as part of the detailed design stage.

Photograph 4.2 Inverter surrounded by PV module rows (Source: Ingeteam 2018)

A medium voltage (MV) cable reticulation network will be required to transport the electricity around each of the three arrays. If underground, cables of either 11 kV, 22 kV or 33 kV will be installed at a depth of at least 600 millimetres (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 each of the internal solar array substations (up to three in total) or the grid connection substation.

A small corridor for MV cabling may be required between two land parcels in the southern array area. The indicative alignment of this cabling is presented in Figure 1.2. The exact alignment will be determined during detailed design.

4.3.2 Solar array substations

Up to three substations will be required (potentially one within each of the three solar arrays) to step the MV up to HV. Based on preliminary designs, each substation will require transformers to step up from 33 kV to 132 kV. Each substation will likely consist of an indoor switch room to house MV circuit breakers, and an outdoor switch yard to house the transformer(s), gantries and associated infrastructure. The total pad area for each solar array substation is likely to be in the order of approximately 3-4 ha.

The indicative locations for the solar array substations are provided in Figure 1.2. 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.

4.3.3 Collector network and grid substation

Up to three new overhead transmission lines will transport electricity from each of the internal solar array substations to the grid substation. Based on preliminary designs, the anticipated voltage is 132 kV.

The alignment of the overhead transmission lines and 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 55 m. 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 will be dependent on the type of structure selected but is likely to be approximately 45 m in width. The distance between each structure will also be dependent on the type of structure selected. Where possible, structures will avoid identified environmental constraints on the land parcels between the three array areas. Complete clearance of vegetation within each of the proposed easements may be required.

Indicative alignments for each of the overhead transmission lines are presented in Figure 1.2. As illustrated in Figure 1.2, three options are being considered for the transmission line between the northern and central array areas. The indicative alignment to connect the southern array area to the central array area extends over approximately 9.5 km via land owned by two of the project landholders and a 1 km section along the southern road easement of Gostwyck Road.

The grid substation will be adjacent to TransGrid's 330 kV transmission line, which traverses the northern and central array areas (Figure 1.2). At the grid substation, the electricity generated by the three solar arrays will be stepped up to 330 kV and injected into the electricity grid via TransGrid's 330 kV transmission line. The grid substation will require a pad area of up to 10 ha.

Three separate areas, one in the northern array and two in the central array, are currently being considered for the grid substation. Footprints providing adequate flexibility for design and siting of the grid substation at these three locations are provided on Figure 1.2. The exact dimensions will be refined during the detailed design stage of the project and in consultation with TransGrid.

4.3.4 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 three BESS facilities (one at the grid substation and two at the internal solar array substations).

4.3.5 Construction accommodation village

A construction accommodation village for non-local construction employees (where skills cannot be sourced locally) may be established as part of the early stages of the project's construction.

The construction accommodation village will be on part of Lot 2 of DP 174053 in the northern array area (refer Figure 1.2).

To build the construction accommodation village, topsoil will be stripped where necessary, hardstand constructed and walkways and car parks constructed.

4.3.6 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 three array areas from the surrounding road network including The Gap Road, Salisbury Plains Road, Hillview Road, Munsies Road and Big Ridge Road (refer Figure 1.2);
- emergency access points to enable access to the three 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 three areas to allow for construction and ongoing maintenance; and
- fencing and landscaping around the solar arrays, substations and BESSs.

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 three 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.

Chain mesh security fencing will be installed within the project boundary to a height of up to 2.4 m. The location of the security fencing will be determined in consultation with the 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.

4.4 Operations

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 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;
  - landscaping; and

- infrastructure maintenance including:
    - module cleaning;
    - module, inverter and tracker system repair (if required); 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. O&M activities will typically be undertaken by specialist subcontractors and/or equipment manufacturers.

UPC is currently in discussions with a number of the landholders to enable sheep grazing to resume on portions of the three 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 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 PV module cleaning will be transported to the three 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 three array areas and project infrastructure.

4.5 Mitigation of visual impacts

Development of the project design has included and will continue to include general measures to reduce the degree of contrast between project infrastructure and the surrounding rural landscape, having regard to the form, scale, height, colour and texture of materials incorporated as part of the project.

As noted in Section 4.1, the significant refinements to the northern and southern array areas have also reduced the overall visual impacts of the project.

4.5.1 Landscaping

A conceptual landscaping plan is shown in Figure 4.2, which presents the option for landscaping at two locations within proximity of S9, including:

- along the eastern property boundary to address the potential visibility of project infrastructure to the east of S9; and
- within proximity of the southern property boundary to address the potential visibility of project infrastructure to the south of S9.

The conceptual landscaping plan presented in Figure 4.2 has been prepared in consultation with the project landholders and the property owners of S9. The proposed landscaping will reduce the visibility of project infrastructure from the dwelling at S9 and within the property boundary.

The final location and extent of landscaping will be determined during detailed design and following subsequent discussions with the project landholders and the property owners of S9 as part of preparation of the environmental management plan (EMP).

The vegetation buffer would have a diameter of up to 10 m with plants spaced out to enable adequate growth. Subject to local conditions (ie soil quality and water availability), it is anticipated that within two years, proposed landscaping will provide sufficient coverage to partially screen project infrastructure within the array areas.

Vegetation species used during landscaping will be subject to consultation with NSW Rural Fire Service (RFS), project landholders, S9 and local suppliers. Examples of tall trees, large shrubs, medium shrubs and hardy low shrubs are provided in Table 4.1. During consultation with a local supplier, it was noted that these species are capable of providing screening, grow fairly quickly and are readily available within the Uralla Shire LGA and surrounds.

Table 4.1 Suggested native shrub species for landscaping

Scientific name	Common name	Potential height range
Tall trees		
Eucalyptus melliodora	Yellow Box	up to 30 m
Angophora floribunda	Rough-barked Apple	up to 30 m
Eucalyptus blakelyi	Blakely's Red Gum	up to 25 m
Eucalyptus caliginosa	Broad-leaved Stringybark	up to 25 m
Eucalyptus viminalis	Manna Gum	up to 30 m
Eucalyptus dalrympleana	Mountain Gum	up to 25 m
Eucalyptus pauciflora	Snow Gum	up to 20 m
Eucalyptus stellulata	Black Sallee	up to 15 m
Casuarina cunninghamiana	River Oak	up to 30 m
Eucalyptus nova-anglica	New England Peppermint	up to 25 m
Large shrubs		
Banksia integrifolia	Honeysuckle	Up to 12 m
Allocasuarina littoralis	Black She-Oak	Up to 12 m
Acacia melanoxylon	Blackwood	up to 15 m
Acacia rubida	red stemmed Wattle	Up to 8 m
Acacia filicifolia	Fern-leaved Wattle	Up to 12 m
Acacia dealbata	Silver Wattle	up to 15 m
Medium shrubs		
Callistemon sieberi	*River Bottlebrush*	*Up to 6 m*
Callistemon pityoides	*Alpine Bottlebrush*	*Up to 3 m*
Callistemon pungens	-	*Up to 3 m*
Leptospermum polygalifolium	*Mountain tea-tree*	*Up to 3 m*
Leptospermum brevipes	*Grey tea-tree*	*Up to 3 m*
Acacia siculiformis	*Dagger Wattle*	*Up to 4 m*
Bursaria spinosa	*Blackthorn*	*Up to 4 m*

Table 4.1 Suggested native shrub species for landscaping

Scientific name	Common name	Potential height range
Hardy low shrubs		
Hakea microcarpa	Small-fruited Hakea	Up to 2 m
Lomandra longifolia	Spiny Mat Rush	Up to 1.3 m
Daviesia latifolia	Hop Bitter Pea	Up to 2 m

In addition to proposed landscaping at S9, discussions between UPC, the relevant project landholder and the tenant at S11 will inform requirements for landscaping to mitigate views at Viewpoint 1 (refer Section 5.3.1).

Discussions between UPC and N1 are ongoing and include consideration of options for landscaping to address the potential visibility of project infrastructure from the southern aspect of the dwelling at Viewpoint 5, should it be required (refer Section 5.3.5).

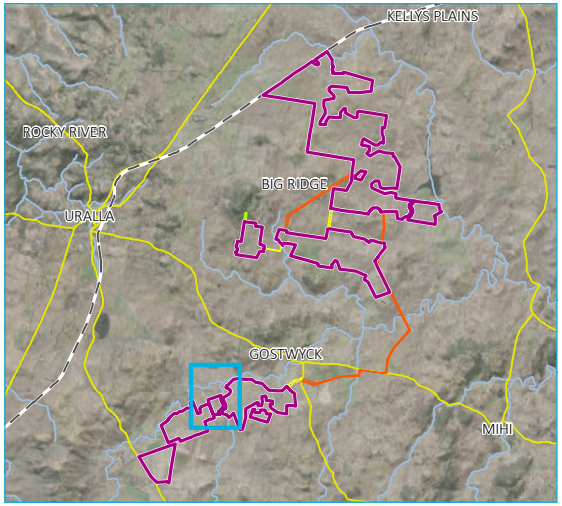
4.5.2 Colour of materials

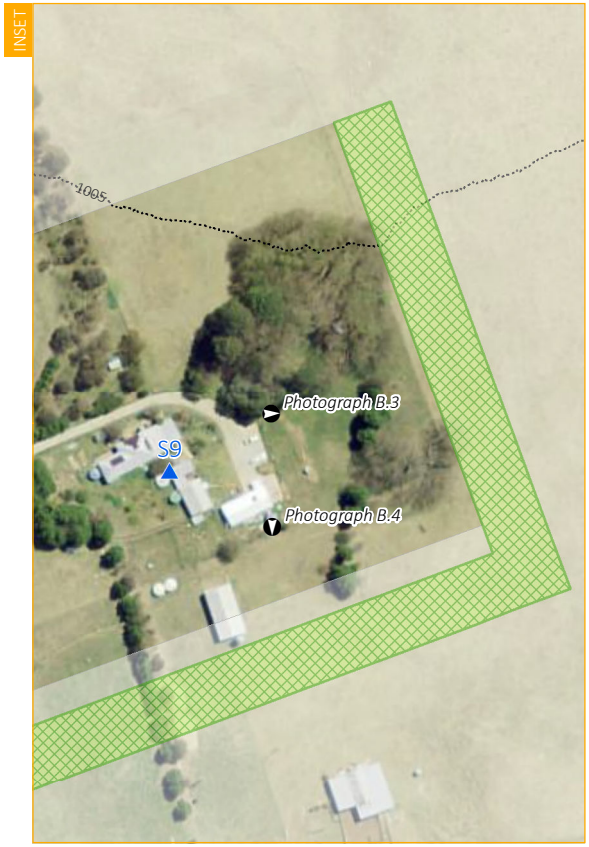
Where possible, suitable colours will be chosen for project infrastructure to minimise visual impacts, including in particular the O&M buildings/facilities and the BESS housing. These buildings and materials will be designed to blend in with the local rural/farming landscape and will not be dissimilar to existing farm sheds and agricultural infrastructure in the area surrounding the three arrays. In addition, if practicable, the PCUs may be painted in a neutral colour (eg khaki, beige, green or similar) rather than white, so as to better blend in with the local rural landscape.

4.5.3 Night lighting

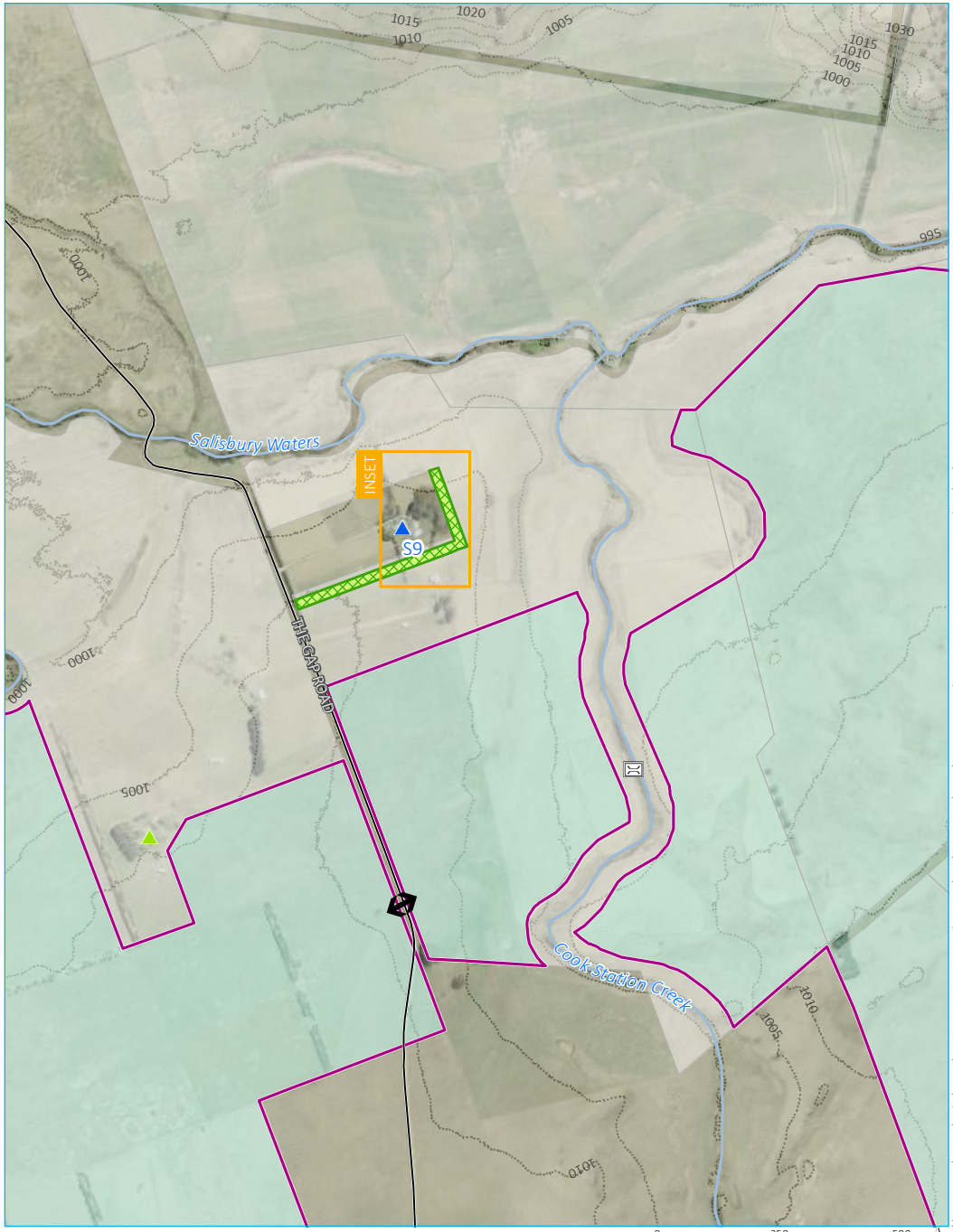
As noted in Section 3.8, the project will require limited permanent night lighting, most likely for the O&M buildings and substations. Temporary, localised night lighting may be required during general maintenance activities conducted during the operation stage of the project. If required, lighting will be managed to minimise impacts on surrounding areas.

All external lighting will be installed as low intensity lighting (except where required for safety or emergency purposes) and will comply with Australian Standard AS 4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting. In addition, all external lighting will not shine above the horizontal.





Source: EMM (2018); DFSI (2017); GA (2015)



KEY

- Photograph location and direction
- Area of proposed landscaping (not to scale)
- Local road
- Named watercourse
- Contour (5 m)
- Project boundary

Development footprint

- Solar array
- Potential creek crossing
- Primary site access point

Sensitive receptors

- Project-related
- Non-project related

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Conceptual landscaping plan

New England Solar Farm
Visual impact assessment
Figure 4.2

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5 Visual assessment

5.1 Assessed viewpoints

As part of the preparation of this VIA, a number of site inspections have taken place across March, May, June and August 2018. The purpose of these site inspections has been to ground-truth the representative viewpoints identified during the initial desktop analysis and discuss potential views of project infrastructure with neighbouring landholders. During these inspections, photographs from these representative viewpoints were captured and a selection of these photographs has been provided in Appendix B. Figure B1 in Appendix B identifies the photograph locations and viewing directions and Table B.1 provides the approximate distance from each photograph location to the closest solar array. The representative viewpoints were selected based on the following criteria:

- proximity to the three array areas;
- the location of receptors (ie dwellings);
- the positioning of regional and local roads and potential impacts on passing motorists;
- the location of items of local heritage significance listed within the Uralla LEP;
- local topography; and
- presence of remnant vegetation and wind breaks with potential to provide screening.

The locations of the receptors considered as part of this assessment are provided on Figure 5.1. As part of the preparation of this VIA, a total of 39 non-project related receptors were identified within approximately 2 km of the development footprint.

The locations of the 19 viewpoints considered as part of this assessment are illustrated on Figure 5.2 (northern array), Figure 5.3 (central array) and Figure 5.4 (southern array). Each of these figures also include the locations of surrounding receptors, local and regional roads and items of local heritage significance listed within the Uralla LEP. The figures also include contours, which demonstrate the undulating nature of the landscape surrounding the three array areas.

The rationale for the selection of each of the viewpoints analysed as part of this report are summarised in Table 5.1.

Table 5.1 Assessed viewpoints, receptors and rational for selection

Assessment location	Viewpoint type(s)	Representative receptors	Rationale for selection
Viewpoint 1	Dwelling	S11*	Views are representative of a receptor (ie dwelling) on Salisbury Plains Road, S11, adjacent to the southern array area. At its closest point, the development footprint for the southern array area is approximately 40 m from S11.
Viewpoint 2	Dwelling	S9	Views are representative of a receptor (ie dwelling) on The Gap Road, S9, within proximity of the southern array area. At its closest point, the development footprint for the southern array area is approximately 240 m from S9.
Viewpoint 3	Dwellings	S3; S1; S2	Views are representative of a receptor (ie dwelling) on Gostwyck Road, S3, within proximity of the southern array area. At its closest point, the development footprint for the southern array area is approximately 2.9 km from S3. Viewpoint 3 is within close proximity of S1 and S2. S1, S2 and S3 are also within proximity of the development footprint for the central array area, at a distance of 2.1 km, 2.3 km and 2.8 km, respectively.
Viewpoint 4	Dwelling	S14	Views are representative of a receptor (ie dwelling) on Thunderbolts Way, S14, within proximity of the southern array area. At its closest point, the development footprint for the southern array area is approximately 1,070 m from S14.
Viewpoint 5	Dwelling	N1	Views are representative of a receptor (ie dwelling) on Old Gostwyck Road, N1, within proximity of the northern array area. At its closest point, the development footprint for the northern array area is approximately 350 m from N1.
Viewpoint 6	Dwelling	N40*	Views are representative of a receptor (ie dwelling) on Saumarez War Service Road, N40, within proximity of the northern array area. At its closest point, the development footprint for the northern array area is approximately 390 m from N40.
Viewpoint 7	Local heritage item	Uralla LEP listing I10 S8	Views are representative of Gostwyck Memorial Chapel and Precinct, an item of local heritage significance listed on the Uralla LEP, within proximity of the southern array area. At its closest point, the development footprint for the southern array area is approximately 1,100 m from Gostwyck Memorial Chapel (Photograph B.14). At its closest point, the potential site access and ETL corridor from Hillview Road into the southern array area is approximately 700 m south of Gostwyck Memorial Chapel. Viewpoint 7 is within close proximity of S8.
Viewpoint 8	Local heritage item Motorists	Uralla LEP listing I11	Views are representative of Deeargee Woolshed, an item of local heritage significance listed on the Uralla LEP, within proximity of the southern array area. At its closest point, the development footprint for the southern array area is approximately 970 m from Deeargee Woolshed (Photograph B.16). The potential site access corridor from Hillview Road into the southern array area is approximately 330 m south of Deeargee Woolshed. Views are also representative of those experienced by motorists travelling along Hillview Road.
Viewpoint 9	Motorists	-	Views are representative of those experienced by motorists travelling along Gostwyck Road.

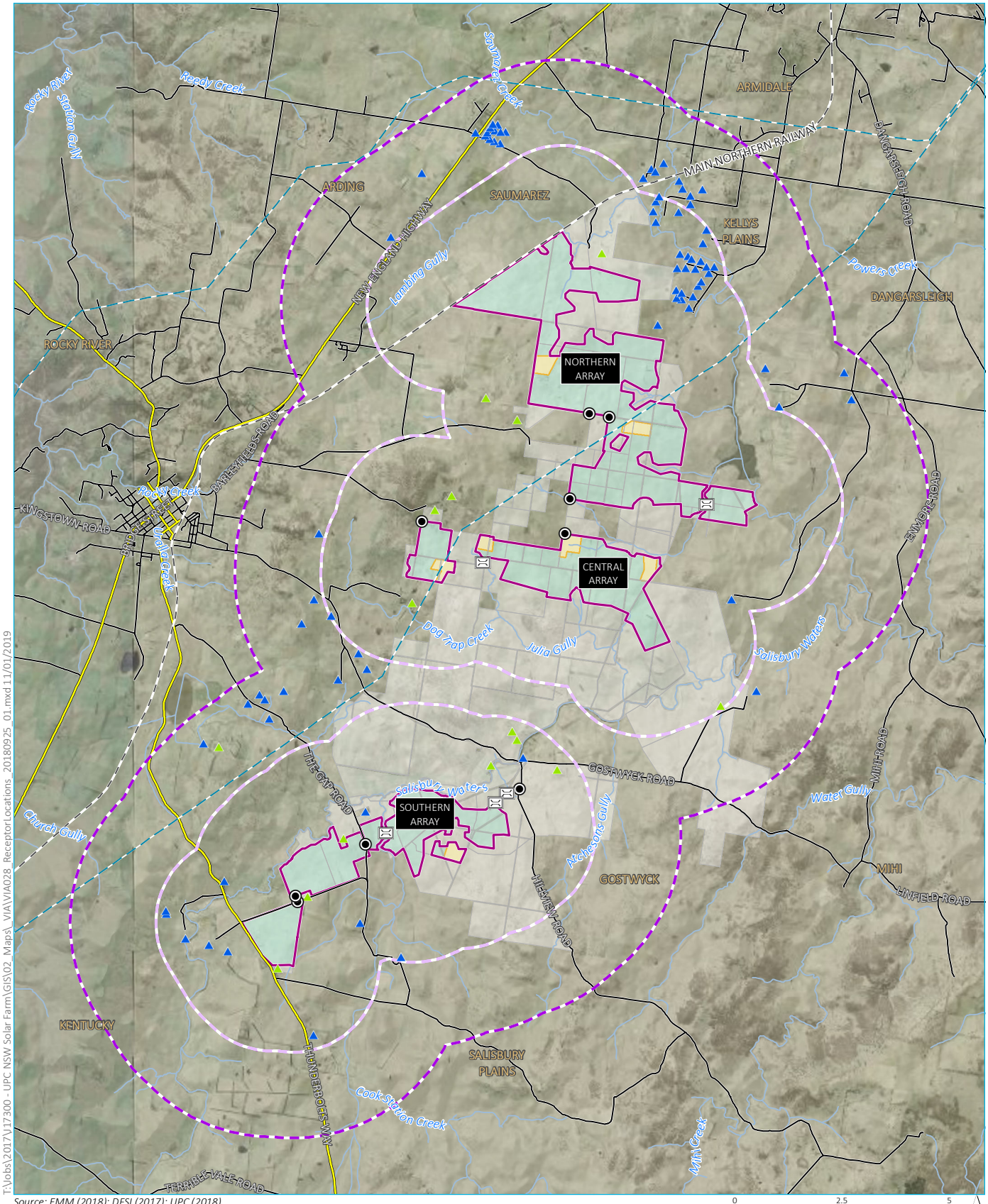
Table 5.1 Assessed viewpoints, receptors and rational for selection

Assessment location	Viewpoint type(s)	Representative receptors	Rationale for selection
Viewpoint 10	Dwelling Motorists	C6	Views are representative of a receptor (ie dwelling) on Gostwyck War Service Road, C6, within proximity of the central array area. At its closest point, the development footprint for the central array area is approximately 2.3 km from C6. The potential ETL easement between the southern and central array areas is approximately 1.3 km south-west of C6 (at its closest point). Views are also representative of those experienced by motorists travelling along Gostwyck War Service Road; however, it is noted that this public road corridor experiences limited daily vehicle movements and is primarily used by a small number of local residents.
Viewpoint 11	Dwelling Motorists	C5	Views are representative of a receptor (ie dwelling) on Elliots Road, C5, within proximity of the central array area. At its closest point, the development footprint for the central array area is approximately 1.7 km from C5. Views are also representative of those experienced by motorists travelling along Elliots Road; however, it is noted that this public road corridor experiences limited daily vehicle movements and is primarily used by a small number of local residents.
Viewpoint 12	Motorists	-	Views are representative of those experienced by motorists travelling along Thunderbolts Way. At its closest point, Viewpoint 12 is approximately 1.9 km from the development footprint for the southern array area.
Viewpoint 13	Local heritage item Dwellings Motorists	Uralla LEP listing I14 S16; S17; S19; S20; S22	Views are representative of Salisbury Court, an item of local heritage significance listed on the Uralla LEP, within proximity of the southern array area. At its closest point, the development footprint for the southern array area is approximately 75 m from the road frontage of Lot 1 of DP 1030870, which makes up the listing for Salisbury Court. At its closest point, the Salisbury Court homestead on Lot 1 of DP 1030870 (S16) is approximately 900 m from the development footprint for the southern array area. Viewpoint 13 is within close proximity of S17, S19, S20 and S22. Views are representative of those experienced by motorists travelling along Thunderbolts Way. Views are also representative of those experienced by motorists turning into Salisbury Plains Road from Thunderbolts Way and entering/exiting the driveway to Salisbury Court.
Viewpoint 14	Motorists	-	Views are representative of those experienced by motorists travelling along the New England Highway. At its closest point, Viewpoint 14 is approximately 2.4 km from the development footprint for the northern array area.
Viewpoint 15	Dwellings Motorists	N41; N42; N43; N44	Views are representative of dwellings on Saumarez War Service Road. At its closest point, Viewpoint 15 is approximately 2.4 km from the development footprint for the northern array area. Views are also representative of those experienced by motorists travelling along Saumarez War Service Road.
Viewpoint 16	Dwellings	N24; N25; N26; N27	Views are representative of dwellings on Burns Road. At its closest point, Viewpoint 16 is approximately 2.5 km from the development footprint for the northern array area.
Viewpoint 17	Dwellings	N20; N21; N22; N23; N28	Views are representative of dwellings on Heathersleigh Road. At its closest point, Viewpoint 17 is approximately 2.1 km from the development footprint for the northern array area.

Table 5.1 Assessed viewpoints, receptors and rational for selection

Assessment location	Viewpoint type(s)	Representative receptors	Rationale for selection
Viewpoint 18	Dwellings	N10; N11; N12; N13; N14; N15; N16; N17; N18; N19	Views are representative of dwellings on Harriet Gully Road. At its closest point, Viewpoint 18 is approximately 1.1 km from the development footprint for the northern array area.
Viewpoint 19	Dwellings	N2; N3; N4; N5; N6; N7; N8; N9	Views are representative of dwellings on Corey Road. At its closest point, Viewpoint 19 is approximately 1 km from the development footprint for the northern array area. Viewpoint 19 is also within proximity of N8 and N9 on Old Gostwyck Road.

*Notes: *These are rental properties owned by two of the project landholders and are therefore considered project-related receptors.*



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Source: EMM (2018); DFSI (2017); UPC (2018)

0 2.5 5 km

GDA 1994 MGA Zone 56

N

Location of receptors

KEY

- 330 kV transmission line
- Rail line
- Main
- Local road
- Watercourse/drainage line
- 2 km
- 4 km
- Project boundary

Development

- Solar array
- Potential ETL easement
- Potential site access corridor
- Potential site access/ETL easement
- Potential substation/BESS footprint
- Potential electrical cabling/site access corridor
- Potential creek crossing

- Proposed primary site access point

Sensitive receptors

- Project-related
- Non-project related

New England Solar Farm
Visual impact assessment
Figure 5.1

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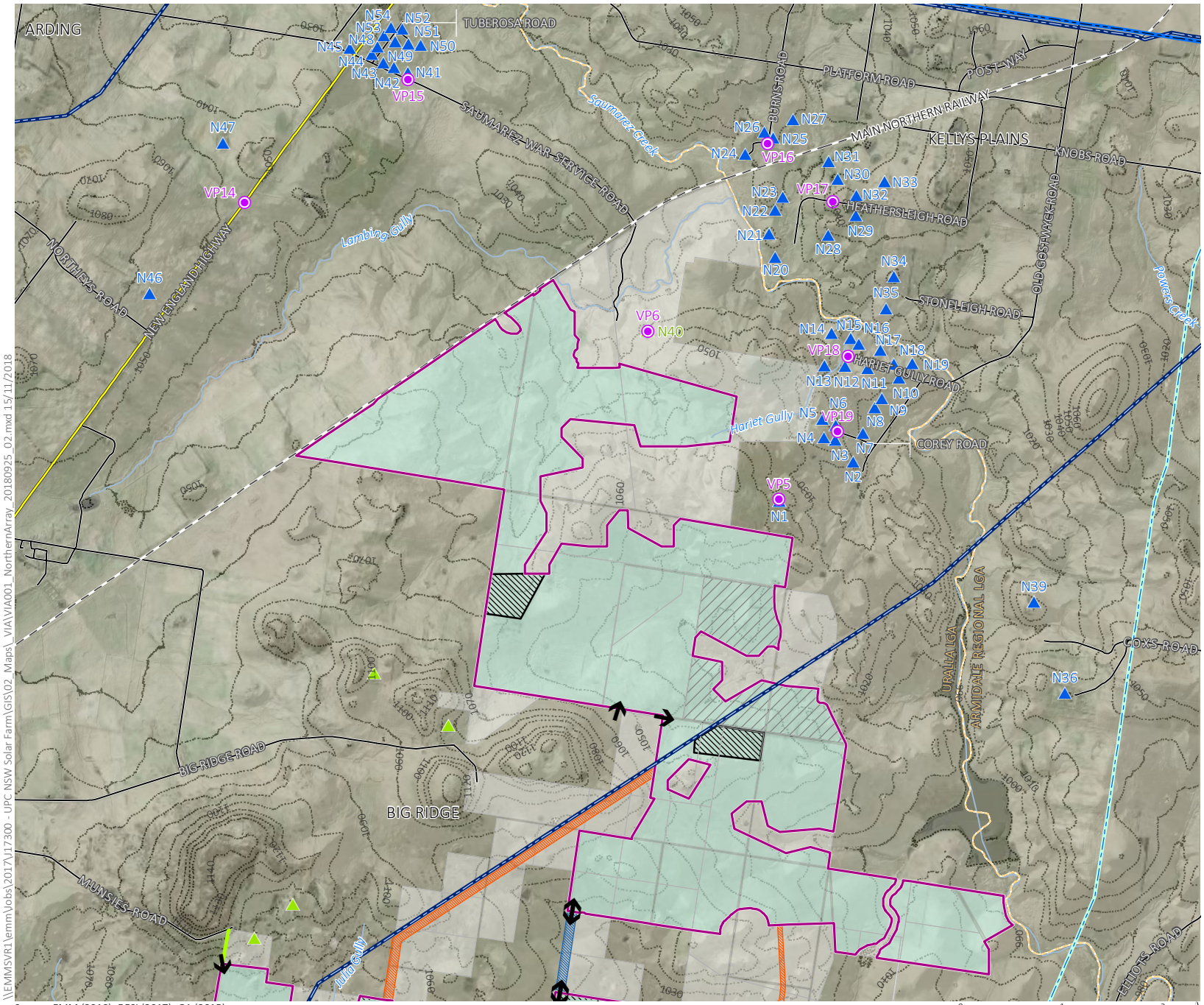

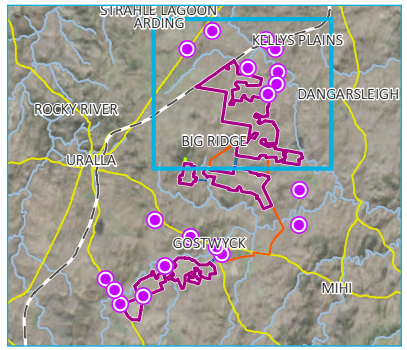

KEY

- Viewpoint location
- Existing 330 kV transmission line
- Existing 132 kV transmission line
- Existing 66 kV transmission line
- Rail line
- Main road
- Local road
- Named watercourse
- Contour (10 m)
- Local government area
- Project boundary
- Proposed primary site access point

Development footprint

- Solar array
- Potential ETL easement
- Potential site access corridor
- Potential site access/ETL easement
- Potential substation/BESS footprint
- Potential site for construction accommodation village

Sensitive receptors

- Project-related
- Non-project related

Viewpoint locations and receptors - northern array

New England Solar Farm
Visual impact assessment
Figure 5.2

EMM creating opportunities

Source: EMM (2018); DFSI (2017); GA (2015)

0 1 2 km

GDA 1994 MGA Zone 56

N

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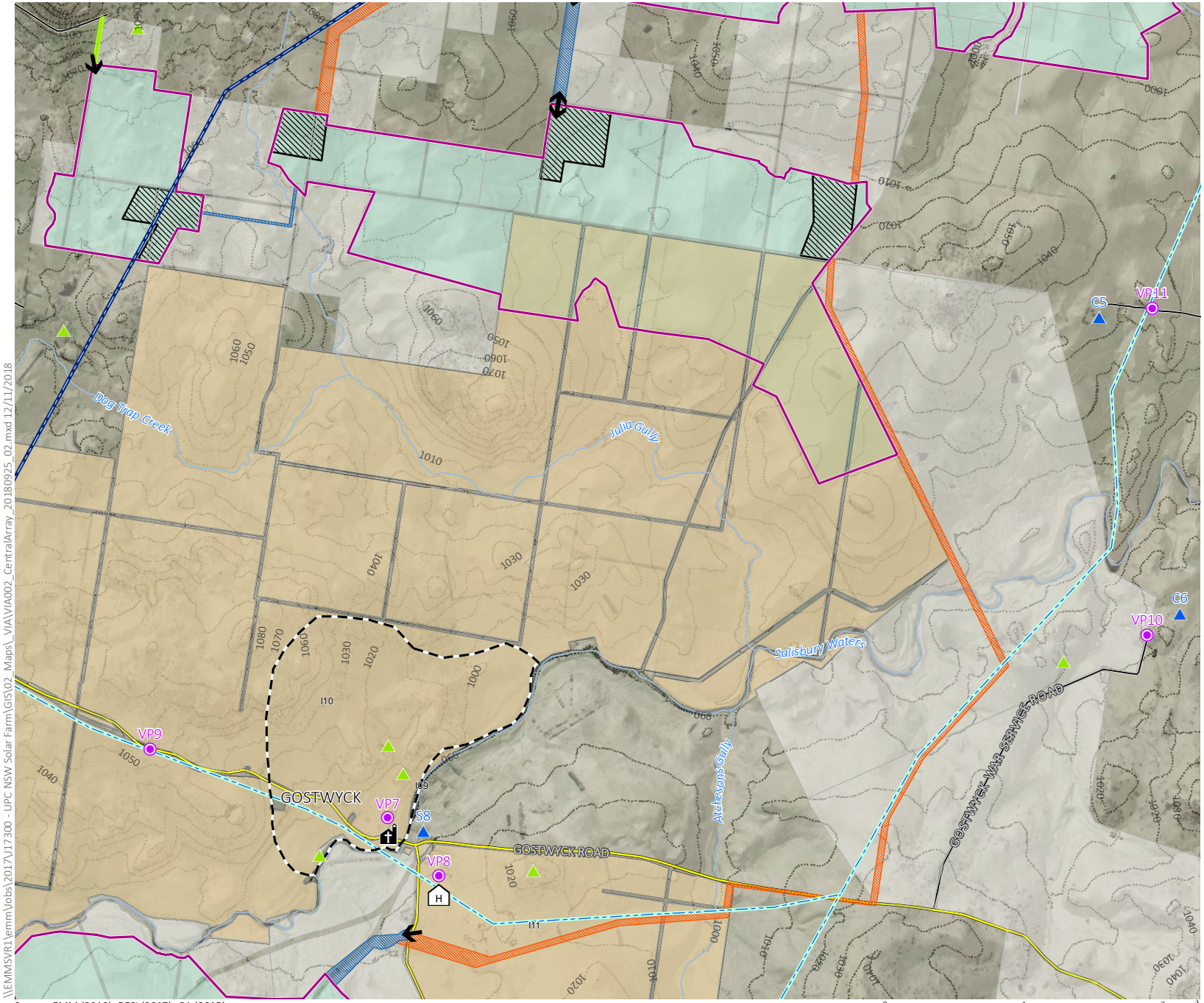

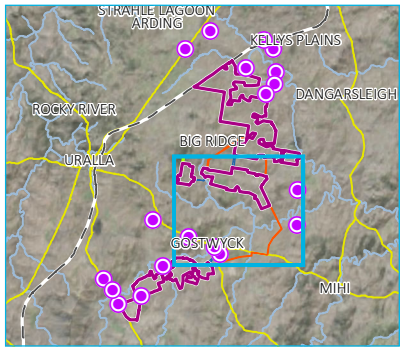

KEY

- Viewpoint location
- Existing 330 kV transmission line
- Existing 66 kV transmission line
- Main road
- Local road
- Named watercourse
- Contour (10 m)
- Chapel
- Deeargee Woolshed
- Gostwyck Memorial Chapel Precinct

Schedule 5 LEP (EP&A Act 1979)

- Item - General
- Project boundary
- Proposed primary site access point

Development footprint

- Solar array
- Potential ETL easement
- Potential site access corridor
- Potential site access/ETL easement
- Potential substation/BESS footprint

Sensitive receptors

- Project-related
- Non-project related

Source: EMM (2018); DFSI (2017); GA (2015)

0 1 2 km

GDA 1994 MGA Zone 56

N

Viewpoint locations and receptors - central array

New England Solar Farm
Visual impact assessment
Figure 5.3

EMM creating opportunities

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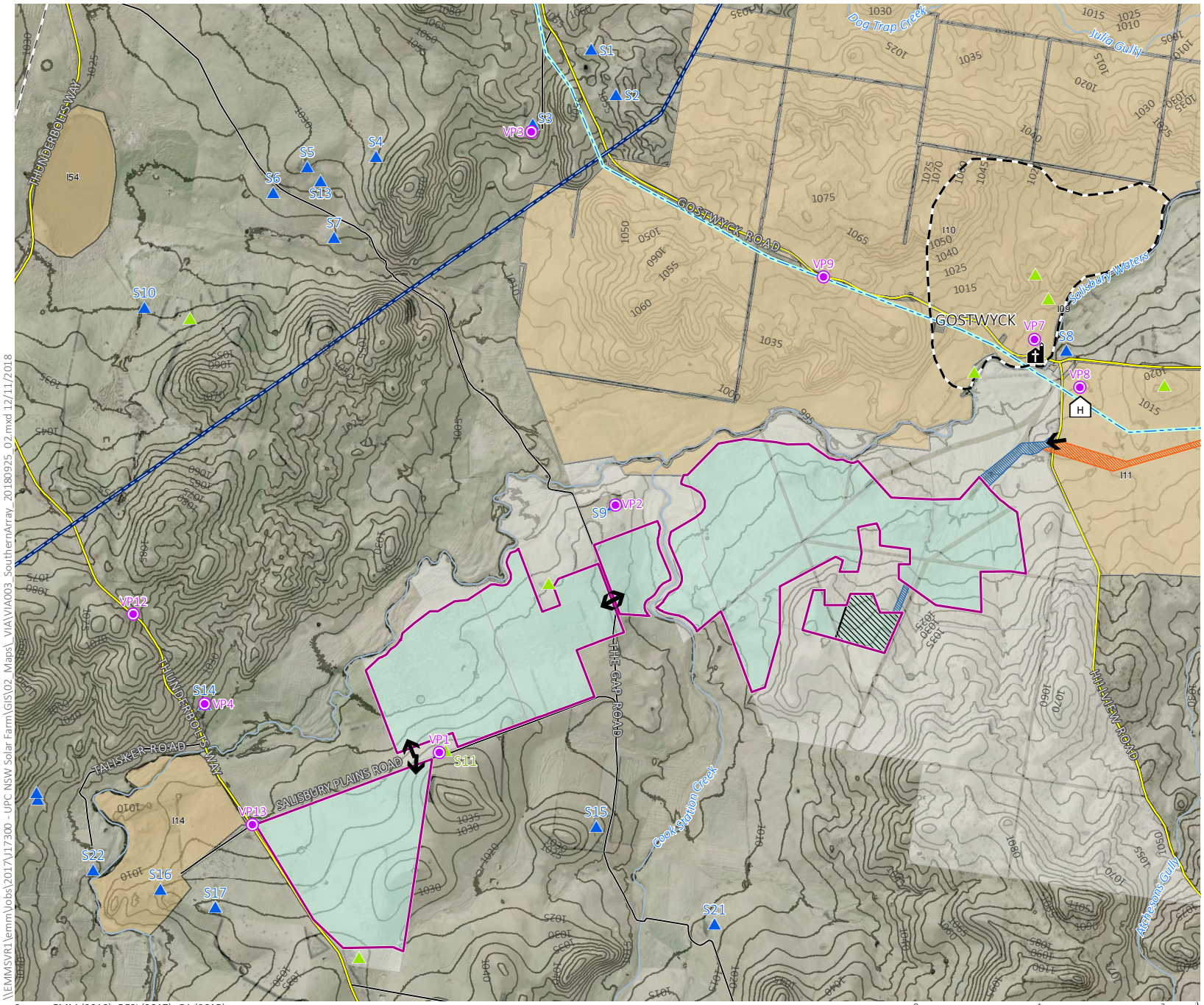

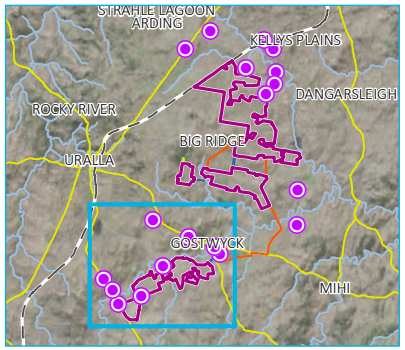

KEY

- Viewpoint location
- Existing 330 kV transmission line
- Existing 66 kV transmission line
- Rail line
- Main road
- Local road
- Named watercourse
- Contour (5 m)
- Chapel
- Deeargee Woolshed
- Gostwyck Memorial Chapel Precinct

Schedule 5 LEP (EP&A Act 1979)

- Item - General
- Project boundary
- Proposed primary site access point

Development footprint

- Solar array
- Potential ETL easement
- Potential site access/ETL easement
- Potential substation/BESS footprint

Sensitive receptors

- Project-related
- Non-project related

Viewpoint locations and receptors - southern array

New England Solar Farm
Visual impact assessment
Figure 5.4

EMM creating opportunities

Source: EMM (2018); DFSI (2017); GA (2015)

0 1 2 km

GDA 1994 MGA Zone 56

N

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5.2 Construction impacts

A description of the site establishment and construction activities associated with the project is provided in Chapter 4.

As noted in Section 4.2.1, the need for heavy civil works such as grading/levelling and compaction will be minimised, as the flattest land areas within the three array areas, which are already mostly cleared of vegetation, have been selected. Civil works will be required to prepare the three array areas, including fencing installation, construction of internal access tracks, and minor earth works.

As noted in Section 4.2.2, upon completion of the site establishment and pre-construction activities, construction will typically be as follows:

- drive piles;
- install mounting structures and tracker tubes;
- secure PV modules to tracker tubes;
- install medium voltage and high voltage cables;
- install PCUs;
- complete substation augmentation;
- establish the BESS compound; and
- test and commission project infrastructure.

The most significant visual impacts during the construction stage of the project will be experienced by receptors with views of the three arrays areas.

During construction, the landscape within the three array areas will undergo a number of physical changes, namely through the installation of project infrastructure, including PV modules, PCUs, substations and BESSs. This infrastructure will add new features to the visual landscape within the three array areas.

Motorists travelling along the local and regional road network will also experience views of the three array areas during construction. It is assumed the focus of these motorists will be in line with their direction of travel along the affected road corridors.

Due to their temporary nature (ie approximately 36 months), the site establishment works and construction activities are considered unlikely to have any significant visual impacts on passing motorists or nearby receptors. Subsequently, landscaping is not proposed to mitigate visual impacts during the construction stage of the project.

As noted in Section 4.3.5, should it be required, a temporary construction accommodation village for non-local construction employees may be established as part of the early stages of the project's construction. If constructed, the construction accommodation village may accommodate up to 500 workers (subject to demand) and would be on part of Lot 2 of DP 174053 (the subject land) in the northern array area (refer to Figure 1.2). The construction accommodation village is expected to be dismantled and its footprint rehabilitated once the project is built and it moves into the operational stage.

The closest viewpoint to the subject land is Viewpoint 5, which is approximately 890 m north of the northern boundary of the subject land. Viewpoint 5 is representative of views from a rural dwelling (N1). As part of a site inspection at N1, it was noted that the primary aspect from the dwelling including from both the front porch and garden is to the north. Any views from the dwelling looking south towards the subject land for the construction accommodation village are interrupted by remnant vegetation within the landscape between this dwelling and the subject land. This vegetation is unlikely to provide complete screening of the construction accommodation village (should it be required). However, given the distance to the subject land and the temporary nature of this infrastructure (should it be required), no management measures are proposed to mitigate potential visual impacts resulting from the construction accommodation village during the project's 36 month construction period.

Views of the development footprint for the southern array area from Viewpoint 2 (S9) are partially interrupted by existing vegetation and infrastructure both within the property boundary and the immediate surrounds, which includes a goat dairy, farm sheds and a house on an adjacent property to the south that includes an exclusion zone. Due to their temporary nature, the site establishment works and construction activities are considered unlikely to have any significant visual impacts on S9. Subsequently, landscaping is not proposed to mitigate visual impacts during the construction stage of the project; however, planting of vegetation at the start of construction has been proposed by UPC to provide additional time for vegetation growth.

As noted in Section 4.5.1, landscaping is proposed to mitigate the remaining visual impact of the project at S9 prior to the commencement of operations (Figure 4.2). There have been several meetings with the property owners at S9 to discuss the placement of vegetation screening and the final location and extent of landscaping will be determined during detailed design and following further discussions with the project landholders and the property owners of S9 as part of preparation of the EMP. Within two years, it is expected that the proposed landscaping will provide sufficient coverage to partially screen project infrastructure within the array areas.

No additional mitigation measures during the site establishment and construction activities are warranted.

5.3 Operation impacts

An assessment of the selected viewpoints in accordance with the methodology outlined in Chapter 2 of this report is presented in the following sections.

To determine potential visibility of project infrastructure, a viewshed analysis was completed. The results of the viewshed analysis are presented in Appendix A. The figures identify the likely changes to the viewshed experienced at each viewpoint as a result of the installation of the project infrastructure within the development footprint, with a focus on the three array areas.

The viewshed analysis has been generated using both a digital elevation model (DEM) and a digital surface model (DSM), both of which cover the development footprint, the 19 selected viewpoints and their immediate surrounds. The DEM and DSM were built using publicly available ELVIS spatial data from the Foundation Spatial Data Framework. This data was captured in 2015.

The DEM is representative of the bare earth surface and only takes into account the topography of the landscape. The DSM is representative of the actual surface of the earth and takes into account a variety of different features in the landscape, including vegetation and built structures (eg rural dwellings, farm sheds and agricultural infrastructure).

A viewshed analysis based on the DSM alone cannot be used to identify the potential visual impacts of the project as it does not provide a true representation of the ability of certain features to shield views of project infrastructure from a given location. For example, in the case of vegetation, a viewshed analysis based only on the DSM may over exaggerate the shielding potential of this feature. In reality, depending on the nature of the vegetation (eg canopy cover only), views of project infrastructure through vegetation may still be possible. Subsequently, the results of the viewshed analysis presented in Appendix A have included results from both the DEM (layer titled, 'visible project infrastructure – bare earth surface') and the DSM (layer titled, 'visible project infrastructure – accounting for shielding features in the landscape').

To assist with the interpretation of the results presented in the figures within Appendix A, the reader should consider the total area identified as 'visible project infrastructure – bare earth surface' as representative of the worst case scenario for each viewpoint (ie the maximum visible extent of project infrastructure from the selected viewpoint). The total area identified as 'visible project infrastructure – accounting for shielding features in the landscape' should be considered representative of the best case scenario for each viewpoint (ie the minimum visible extent of project infrastructure from the selected viewpoint).

The viewshed analysis presented in the figures in Appendix A only takes into account the height of the dominant project infrastructure, ie the PV modules. As part of the viewshed analysis, the height of the PV modules was conservatively assumed to be 4.3 m. This is representative of the height of the PV modules at their maximum tilt angle (ie 4 m) and allows site-specific clearance of up to 30 cm, should it be required to avoid flooding risk or to improve access for sheep to graze underneath the PV modules.

Other project infrastructure including PCUs, substations, BESSs, O&M facilities and ETLs have not been considered as part of the viewshed analysis. The exact location of this infrastructure within the development footprint is more difficult to specify at this stage of the project's development and will be determined during the detailed design stage of the project. For example, the location of the PCUs will be dependent on the type of inverter chosen. The proposed footprints for the substations and BESSs, as well as the subject land for the construction accommodation village (refer Figure 1.2) have been positioned within the development footprint with a view to minimising or avoiding visual amenity impacts on nearby residences wherever possible.

One of the key criteria considered during the selection of the potential substation/BESS footprints identified on Figure 1.2 has been proximity to rural dwellings. As noted above, this infrastructure has not been considered as part of the viewshed analysis. However, based on field investigations and a review of aerial imagery, in the majority of cases, it is anticipated that views of this infrastructure will be at least partially screened from all of the selected viewpoints. This is primarily due to undulation and remnant vegetation in the landscape combined with distance to the potential footprints. Further, as noted in Section 4.3.4, it is anticipated that the BESSs will be housed within either a number of small enclosures/cabinets or larger battery buildings. Regardless of the housing selected during the detailed design stage of the project, this infrastructure will be designed to integrate with existing elements in the landscape wherever possible, having regard to form, height and colour. Should they be required, the large building type of enclosures will be similar in appearance to the large agricultural sheds, which currently exist in the landscape within the three array areas and their surrounds.

As noted in Section 3.3, existing ETL infrastructure traverses the project boundary, which includes TransGrid's existing 330 kV transmission line, Essential Energy's existing 66 kV sub-transmission line and a number of 11 kV local supply lines. Due to the presence of existing overhead wiring within the landscape, the project's potential ETL alignments have not been considered as part of the viewshed analysis.

When considering the bare earth surface (ie topography) within the development footprint and surrounds, the results of the viewshed analysis indicate that project infrastructure will be visible to varying degrees from 17 of the 19 viewpoints assessed as part of this VIA. As identified by the 5 m contours presented on Figure 5.2 (northern array), Figure 5.3 (central array) and Figure 5.4 (southern array), the landform pattern within and surrounding the development footprint can be described as a mix of low rolling hills. At a number of the selected viewpoints, undulation within the landscape limits the extent of the visual landscape affected by project infrastructure.

By accounting for potential shielding features within the landscape (eg vegetation) both within the development footprint and surrounds, the number of viewpoints anticipated to experience views of project infrastructure reduces from 19 to 14 viewpoints. However, as noted above, there are limitations to relying on the results of a viewshed analysis that includes consideration of a DSM. Nonetheless, the results presented in Appendix A indicate the potential for shielding features in the landscape to reduce the visibility of project infrastructure from a number of the selected viewpoints. This is largely due to scattered remnant vegetation, planted wind breaks and extensive vegetation screens around the boundaries of rural residential dwelling.

Based on aerial imagery and ground truthing, a large number of the rural residential dwellings surrounding the three array areas feature extensive vegetation screens on their boundaries. These screens would mitigate dust and noise impacts from existing agriculture-related activities on land adjacent to these dwellings.

A key observation made during the site inspections conducted as part of the preparation of this assessment was that the presence of vegetation screens, as well as stands of both scattered and more dense vegetation (including planted wind breaks) between the three array areas and a number of rural dwellings, means that views to the three array areas are typically at least partially obstructed from most locations, with the exception of views of the development footprint from passing motorists travelling along the local and regional road network. Potential views of project infrastructure within the development footprint for the southern array area from Thunderbolts Way (over a distance of up to 3 km), Salisbury Plains Road (over a distance of up to 3 km) and The Gap Road (over a distance of up to 2 km) would also be partially obstructed by remnant vegetation, roadside vegetation and planted wind breaks. Examples of vegetation screening around nearby receptors (ie dwellings) are provided in Photograph B.3 (S9) and Photograph B.7 (S14).

Project infrastructure in the southern array area may also be visible from the Gostwyck Memorial Chapel and Precinct (Viewpoint 7), Deeargee Woolshed (Viewpoint 8) and Salisbury Court (Viewpoint 13) and their surrounds. As highlighted by the results of the viewshed analysis in Appendix A and illustrated by the photographs presented in Appendix B, remnant and planted vegetation in the landscape between Gostwyck Memorial Chapel and Precinct (Photograph B.14) and Deeargee Woolshed (Photograph B.16 and Photograph B.17) and the development footprint for the southern array area will limit views of project infrastructure from both of these locally listed heritage items.

The output presented in Figure A7 indicates that project infrastructure within the southern array area would not be visible from Gostwyck Memorial Chapel due to the presence of shielding features in the landscape between Viewpoint 7 and the development footprint for the southern array area, which is approximately 1.1 km south of Gostwyck Memorial Chapel at its closest point. However, as noted above, a viewshed analysis based on the DSM alone cannot be used to identify the potential visual impacts of the project as it does not provide a true representation of the ability of certain features to shield views of project infrastructure from a given location.

Observations made during the site inspections and a review of aerial imagery indicate the presence of vegetation screens as well as stands of both scattered and more dense vegetation (including planted wind breaks) between the development footprint for the southern array area and the primary dwelling on Lot 1 of DP 1030870 (ie Salisbury Court homestead (S16) – refer Figure 5.4). Views of project infrastructure within the southern array area are therefore likely to be partially, if not completely, obstructed from view from this locally listed heritage item.

As noted within the historic heritage assessment and statement of heritage impact (refer Appendix E of the EIS), impacts to the setting and cultural landscape will occur as a result of the project. The nature of the project and extent of the three array areas will change some views and vistas and affect the setting of the landscape in some areas. However, it should be noted that the potentially impacted areas identified as part this assessment are not visible from public spaces and are on land owned by the project landholders.

As part of the management and mitigation measures to address the project's impacts on the cultural landscape, detailed digital photographic archival recording is proposed to capture the setting, views and vistas that may be lost temporarily during the project's operations. Photographs will be taken from ground level and using drone photography to capture discrete areas in greater detail than current aerial imagery allows.

5.3.1 Viewpoint 1 – dwelling on Salisbury Plains Road adjacent to the development footprint for the southern array area

Table 5.2 Viewpoint 1 – dwelling on Salisbury Plains Road adjacent to the development footprint for the southern array area

Viewpoint details	This viewpoint, shown in Photograph B.1, is within proximity of a rural dwelling owned by one the project landholders (S11). It has been considered as part of this assessment as it is currently leased to a member of the local community. At its closest point, the development footprint for the southern array area is approximately 40 m from S11. Photograph B.1 was taken from Salisbury Plains Road looking north-east towards S11. The development footprint for the southern array area is visible in the background of this photograph. Photograph B.2 was also taken from Salisbury Plains Road; however, it represents the view looking south from S11 towards Lot 2 of DP 11311, which also forms part of the development footprint for the southern array area. The results of site inspections at this location indicate that there is limited vegetation around S11. There are a number of large agricultural sheds east of S11 on the northern side of Salisbury Plains Road.
View type and context	Immediate views from this location represent a typical rural setting with a large expanse of cleared, agricultural land. Other features visible from this location include planted wind breaks, scattered remnant vegetation, Salisbury Waters and a local road corridor (ie Salisbury Plains Road).
Project refinement	Although the distance to the development footprint for the southern array area from this viewpoint has not changed, reductions to the extent of the southern array area (particularly areas north of Salisbury Waters and areas excised from the southern array area due to potential flooding impacts) are likely to have reduced the visible extent of project infrastructure from S11 (Figure 4.1).
Visibility baseline assessment	The results of the viewshed analysis indicate project infrastructure within the southern array area will be visible from this location (Figure A1). As illustrated within Figure A1, shielding features in the landscape have potential to limit the extent of project infrastructure visible from this viewpoint.
Magnitude of change	**High** – as a result of its close proximity to the development footprint for the southern array area, S11 will be exposed to views of project infrastructure. Although shielding features in the landscape have been identified, these features are unlikely to provide a sufficient level of mitigation to reduce the significance of visual impacts experienced from this viewpoint during the operation of the project. The project infrastructure will add new features to the visual landscape at this location, which will result in a high degree of contrast to the surrounding rural setting.
Visual sensitivity	**Moderate** – due to the presence of a rural dwelling.
Evaluation of significance	**Moderate/substantial –** without additional mitigation, the operation of the project would result in a significant visual impact from this viewpoint. Without mitigation, visual impacts from this viewpoint would continue throughout the life of the project.
Additional mitigation	As noted above, the rural dwelling (S11) is owned by one of the project landholders. It has been considered as part of this assessment as it is currently leased to a member of the local community. Potential impacts at this dwelling will be subject to further discussions between UPC, the project landholder and the tenant at S11 to identify appropriate mitigation to be adopted. A conceptual landscaping plan has not been prepared to address the visual impact from this viewpoint as part of this assessment.

5.3.2 Viewpoint 2 – dwelling on the Gap Road adjacent to the development footprint for the southern array area

Table 5.3 Viewpoint 2 – dwelling on the Gap Road adjacent to the development footprint for the southern array area

Viewpoint details	This viewpoint, shown in Photograph B.3 and Photograph B.4, is within proximity of the closest non-project related rural residential property to the development footprint for the southern array area (S9). A small-scale agricultural business also operates here. Photograph B.3 was taken from within the grounds of the property (not from the dwelling itself) looking east across Cook Station Creek towards the development footprint for the southern array area. The closest part of the development footprint looking east from this location is approximately 550 m away. Photograph B.3 is considered representative of potential views of project infrastructure from the front of the dwelling. Photograph B.4 was also taken from within the grounds of the property (not from the dwelling itself). It is representative of the view looking south towards the development footprint for the southern array area when standing near the fence line, in a gap between existing farm sheds. The closest part of the development footprint looking south from this location is approximately 220 m away. Photograph B.4 is not considered representative of potential views of project infrastructure from the dwelling given the visual screening offered by the existing farm sheds and goat dairy. The results of multiple site inspections at this location indicate that there is a significant amount of vegetation around S9. There are also a number of agricultural sheds within the property that support the landholders' agricultural business.
View type and context	Immediate views from this location represent a typical rural residential setting with a combination of planted and remnant vegetation surrounded by a large expanse of cleared, agricultural land. Other features visible from this location include planted wind breaks, Salisbury Waters, Cook Station Creek and derelict dwellings and agricultural infrastructure (refer Photograph B.4).
Project refinement	UPC commenced targeted consultation with the landholders at S9 in March 2018 and has continued to provide regular project updates and tried to accommodate the feedback provided by the landholders wherever practicable. Throughout the project refinement process, a number of different iterations of the development footprint for the southern array area have been presented to the landholders at S9. As a result of this engagement, approximately 40 ha of land adjacent to S9 has been excluded from the development footprint for the southern array area. This exclusion has increased the buffer between the dwelling itself and the development footprint for the southern array area from approximately 50 m at its closest point (as presented as part of the PEA) to approximately 240 m at its closest point (Figure 4.1). In addition, land to the north and west of S9 (north of Salisbury Waters) has also been removed from the development footprint for the southern array area. During consultation with the property owners at S9, it was noted the views/aspects that they valued most from their dwelling and the property more generally were to the west, north-west, north and north-east. This was the primary reason for UPC removing 585 ha of land north of Salisbury Waters that formed a significant component of the southern array area presented within the PEA. This refinement has removed potential for views of project infrastructure from S9 when looking west, north-west, north and north-east. This refinement also responded to feedback from other residents along The Gap Road (S4, S5, S6, S7 and S13) and has reduced the potential for visual amenity impacts on each of these dwellings.

Table 5.3 Viewpoint 2 – dwelling on the Gap Road adjacent to the development footprint for the southern array area

Visibility baseline assessment	The results of the viewshed analysis indicate project infrastructure within the southern array area will be visible from this location (Figure A2). Shielding features in the landscape (namely planted vegetation surrounding the dwelling) have significant potential to limit the extent of project infrastructure visible from this viewpoint. This is evident in the output presented in Figure A2, which indicates views of project infrastructure in the southern array area would be completely obstructed from view by shielding features in the landscape. As noted previously, a viewshed analysis based on the DSM alone cannot be used to identify the potential visual impacts of the project as it does not provide a true representation of the ability of certain features to shield views of project infrastructure from a given location (in this case, vegetation and farm sheds). Photograph B.3 and Photograph B.4 were selected for preparation of a photomontage (refer to Photograph C.1 and Photograph C.2, respectively). Photomontages enable potential visual changes from a viewpoint to be illustrated on a photograph, with the objective of simulating the visual extent of project infrastructure, once constructed. The photomontages conservatively assume the height of the dominant project infrastructure, the PV modules, will be 4.3 m. This is a highly conservative assumption which is based on the PV module configuration illustrated in Option A within Plate 4.1. As noted in Section 4.3.1, the PV modules will likely be constructed in a single axis tracking configuration, which will allow the PV modules to rotate from east to west during the day tracking the sun's movement. The most typical configuration using single axis tracking is currently a single PV module mounted on the tracker tube in portrait (refer Option B in Plate 4.1). Therefore, the maximum height of the PV modules from the ground to the tip at the maximum tilt angle of 60^{o} is more likely to be in the range of approximately 2-3 m. Consequently, since the results of the viewshed analysis (Figure A2) and the photomontages are based on the less likely 4.3 m high configuration (ie Option A in Plate 4.1), it is likely that the actual visible extent of project infrastructure from within the property boundary at S9 will be less than the areas shown in Figure A2, Photograph C.1 and Photograph C.2.
Magnitude of change	**Moderate** – as a result of its close proximity to the development footprint for the southern array area, S9 will be exposed to views of project infrastructure. Shielding features in the landscape (including vegetation along the eastern property boundary and agricultural sheds south of the dwelling) will provide partial mitigation and reduce the significance of visual impacts experienced from this viewpoint to the south and east during the operation of the project. The project infrastructure will add new features to the visual landscape at this location, which will result in a high degree of contrast to the surrounding rural setting. It should be noted that significant refinements to the development footprint for the southern array area have removed potential for views of project infrastructure to the west, north-west, north and north-east of S9, which, based on engagement with the landholders, are the views/aspects that are valued most by the landholders from their dwelling and the property more generally. Based on observations made from within the property boundary, views from the dwelling would likely be restricted to project infrastructure east of Cook Station Creek at a distance of approximately 550 m. Views from the dwelling to infrastructure on land between The Gap Road (west) and Cook Station Creek (east) are not anticipated due to the presence of planted vegetation within the property boundary as well as other built structures in the landscape between the dwelling and this section of the development footprint for the southern array area.
Visual sensitivity	**Moderate** – due to the presence of a rural dwelling.
Evaluation of significance	Moderate – there will be a moderate visual impact from this viewpoint. Visual impacts from this viewpoint will continue throughout the life of the project.

Table 5.3 Viewpoint 2 – dwelling on the Gap Road adjacent to the development footprint for the southern array area

Additional mitigation	A conceptual landscaping plan is shown in Figure 4.2, which presents the option for landscaping at two locations, including: - along the eastern property boundary to address the potential visibility of project infrastructure to the east of S9; and - within proximity of the southern property boundary to address the potential visibility of project infrastructure to the south of S9. The proposed landscaping will significantly reduce the visibility of project infrastructure from the dwelling at S9 and within the property boundary. As part of the preparation of this VIA, vegetation screening was incorporated into the photomontages presented in Appendix C. Photograph C.3 illustrates the screening potential of landscaping along the eastern property boundary to address the potential visibility of project infrastructure to the east of S9. Photograph C.4 illustrates the screening potential of landscaping along the northern boundary of a small parcel of the development footprint for the southern array (east of The Gap Road and west of Cook Station Creek). The vegetation screens presented in the photomontages contain a mixture of trees (25% coverage at 2.4 m in height) and shrubs (75% coverage at 1.2 m in height) with trees spaced approximately every 4 m and shrubs to fill in the gaps. As noted in Section 4.5.1, the final location and extent of landscaping will be determined during detailed design and following subsequent discussions with the project landholders and the property owners of S9 as part of preparation of the EMP.

5.3.3 Viewpoint 3 – dwelling on Gostwyck Road north of the development footprint for the southern array area

Table 5.4 Viewpoint 3 – dwelling on Gostwyck Road north of the development footprint for the southern array area

Viewpoint details	This viewpoint, shown in Photograph B.5, is within proximity of a private rural residential property north of the development footprint for the southern array area (S3). Photograph B.5 was taken adjacent to the dwelling looking south. At its closest point, the development footprint for the southern array area is approximately 2.9 km from S3. This viewpoint is also representative of potential views from two additional properties off Gostwyck Road, namely S1 and S2, which are approximately 3.3 km and 2.9 km north of the development footprint for the southern array area, respectively. S1, S2 and S3 are also within proximity of the development footprint for the central array area, at a distance of 2.1 km, 2.3 km and 2.8 km, respectively.
View type and context	As shown in Figure A3 and illustrated in Photograph B.5, S3 is at a high point in the landscape with sweeping views across a characteristically rural landscape. Scattered vegetation is present within close proximity of S3 (refer Photograph B.5). In addition to large expanses of cleared agricultural land, other features in the landscape at this location include TransGrid's 330 kV transmission line and supporting structures, planted wind breaks and remnant vegetation, other rural residential dwellings and infrastructure to support agricultural operations.
Project refinement	The exclusion of land north of Salisbury Waters from the southern array area has increased the buffer between S3 and the development footprint for the southern array area from approximately 460 m (as presented as part of the PEA) to approximately 2.9 km (Figure 4.1). In addition to increasing the distance between S3 and the development footprint, the significant revisions to the southern array area (namely the exclusion of infrastructure north of Salisbury Waters) have reduced the visible extent of project infrastructure from S3 (as well as any potential views from S1 and S2). Engagement with the landholders at S2 and S3 identified concerns around the potential visibility of project infrastructure within the southern array area from these dwellings, including PV modules, the solar array substation and the ETL alignment between the southern and central array areas presented as part of the PEA. These concerns were considered as part of the project refinement process and informed UPC's decision to exclude land north of Salisbury Waters from the development footprint for the southern array area and to revise the ETL alignment between the southern and central array area.

Table 5.4 Viewpoint 3 – dwelling on Gostwyck Road north of the development footprint for the southern array area

Visibility baseline assessment	The results of the viewshed analysis indicate project infrastructure within the southern array area will be visible from this location (Figure A3). As illustrated within Figure A3, shielding features in the landscape have the potential to partially screen the extent of project infrastructure visible from this viewpoint. As shown in Photograph B.5, the distant views of project infrastructure in the southern array area from this location would likely be interrupted by scattered planted vegetation within close proximity of S3. Without the presence of shielding features in the landscape, views of the western portion of the development footprint for the central array area (at a distance of approximately 4 km) may also be possible from this viewpoint. Given the distance between the viewer and the altered elements in the landscape within the development footprint for the central array area, the degree of contrast and scale of change are considered negligible. Based on a review of aerial imagery and site inspections performed at both S2 and S3, views of project infrastructure within the central array area from S1, S2 and S3 are likely to be obstructed by remnant vegetation and planted wind breaks. At a distance of approximately 2.1 km from S1, 2.3 km from S2 and 2.8 km from S3, views of project infrastructure in the central array area are not anticipated to be significant from the assessed locations. Photograph B.5 was selected for preparation of a photomontage (refer to Photograph C.5 in Appendix C). Photomontages enable potential visual changes from a viewpoint to be illustrated on a photograph, with the objective of simulating the visual extent of project infrastructure, once constructed. The photomontage conservatively assumes the height of the dominant project infrastructure, the PV modules, will be 4.3 m. This is a highly conservative assumption which is based on the PV module configuration illustrated in Option A within Plate 4.1. As noted in Section 4.3.1, the PV modules will likely be constructed in a single axis tracking configuration, which will allow the PV modules to rotate from east to west during the day tracking the sun's movement. The most typical configuration using single axis tracking is currently a single PV module mounted on the tracker tube in portrait (refer Option B in Plate 4.1). Therefore, the maximum height of the PV modules from the ground to the tip at the maximum tilt angle of 60^{o} is more likely to be in the range of approximately 2-3 m. Consequently, since the results of the viewshed analysis (Figure A3) and the photomontage are based on the less likely 4.3 m high configuration (ie Option A in Plate 4.1), it is likely that the actual visible extent of project infrastructure from S3 will be less than the areas shown in Figure A3 and Photograph C.5.
Magnitude of change	**Low** – the distance to the development footprint from this location will limit the scale of change and degree of contrast for views from this location toward both the southern and central array areas.
Visual sensitivity	**Moderate** – due to the presence of a rural dwelling.
Evaluation of significance	**Slight/moderate** – there would not be a significant impact from this viewpoint. Visual impacts from this viewpoint will continue throughout the life of the project.
Additional mitigation	No additional mitigation measures are warranted based on the evaluation of significance. If landscaping were proposed to screen views of project infrastructure in the southern array area from this location, it is likely that this landscaping would also inhibit the sweeping view across the rural landscape that is currently experienced at this location.

5.3.4 Viewpoint 4 – dwelling on Thunderbolts Way west of the development footprint for the southern array area

Table 5.5 Viewpoint 4 – dwelling on Thunderbolts Way west of the development footprint for the southern array area

Viewpoint details	This viewpoint, shown in Photograph B.6 and Photograph B.7, is within proximity of a private rural residential property west of the development footprint for the southern array area (S14). Photograph B.6 was taken adjacent to the dwelling on the balcony looking east, while Photograph B.7 was taken adjacent to the dwelling at ground level also looking east. At its closest point, the development footprint for the southern array area is approximately 1,070 m east of S14.
View type and context	Immediate views from this location represent a typical rural residential setting with a combination of planted and remnant vegetation surrounded by a large expanse of cleared, agricultural land. Other features visible from this location include planted wind breaks, Salisbury Waters and agricultural infrastructure.
Project refinement	Although the distance to the development footprint for the southern array area from this viewpoint has not changed, reductions to the extent of the southern array area (particularly areas north of Salisbury Waters and areas excised from the southern array area due to potential flooding impacts) are likely to have reduced the visible extent of project infrastructure from S14 (Figure 4.1).
Visibility baseline assessment	The results of the viewshed analysis indicate project infrastructure within the southern array area will be visible from this location (Figure A4). As illustrated within Figure A4, shielding features in the landscape (namely planted vegetation visible in the foreground in Photograph B.6 and Photograph B.7) have significant potential to limit the extent of project infrastructure visible from this viewpoint.
Magnitude of change	**Low** – it is anticipated that planted vegetation adjacent to S14 will limit the scale of change and degree of contrast for views from this location both at ground level and from the elevated balcony attached to the exterior of the dwelling.
Visual sensitivity	**Moderate** – due to the presence of a rural dwelling.
Evaluation of significance	**Slight/moderate** – there would not be a significant impact from this viewpoint. Visual impacts from this viewpoint will continue throughout the life of the project.
Additional mitigation	No additional mitigation measures are warranted based on the evaluation of significance. Due to the extent of planted vegetation separating S14 and the development footprint for the southern array area, it is unlikely that any additional landscaping proposed as part of the project would further mitigate potential visibility of project infrastructure from this viewpoint.

5.3.5 Viewpoint 5 – dwelling on Old Gostwyck Road north-east of the development footprint for the northern array area

Table 5.6 Viewpoint 5 – dwelling on Old Gostwyck Road north-east of the development footprint for the northern array area

Viewpoint details	This viewpoint, shown in Photograph B.8, is within proximity of the closest rural residential property to the development footprint for the northern array area (N1). Photograph B.8 was taken from within the grounds of the property (not from the dwelling itself) looking north-west across a large farm dam towards the development footprint for the northern array area. The closest part of the development footprint looking north-west from this location is approximately 700 m away. Photograph B.8 is considered to be a conservative representation of potential views of project infrastructure from the dwelling since it is taken from the garden adjacent to the dwelling. The closest part of the development footprint for the northern array area from N1 is approximately 350 m south of N1, also within the northern array area. Photograph B.9 was taken from the closest part of the development footprint for the northern array area looking north towards N1. The results of a site inspection at this location indicate that the dominant views from within this dwelling are to the west, north-west and north. There is also scattered remnant vegetation in the landscape between N1 and the development footprint for the northern array area (refer Photograph B.8 and B.9).
View type and context	Immediate views from this location represent a typical rural setting with a large expanse of cleared, agricultural land. Other features visible from this location include scattered remnant vegetation, farm dams, farm sheds and agricultural infrastructure.
Project refinement	UPC commenced targeted consultation with the landholder at N1 in May 2018 and has continued to provide regular project updates and accommodate the feedback from the landholder, wherever practicable. Throughout the project refinement process, different iterations of the development footprint for the northern array area have been presented to the landholder at N1. As a result of this engagement, land to the west, north-west and north of N1 has been excluded from the development footprint for the northern array area, which are aligned with the dominant views from the dwelling and the landowners preferred aspects. This exclusion has not increased the buffer between the dwelling itself and the development footprint for the northern array area as the closest part of the development footprint for the northern array area is approximately 350 m south of N1. However, it was noted during targeted consultation with N1 that the most important aspects from their dwelling are to the west, north-west and north, which are experienced from the garden and porch on the northern side of the dwelling. As part of the project refinement process, the distance from the dwelling to the development footprint for the northern array area directly to the west and north-west has increased by approximately 1.5 km and 100 m, respectively. Project infrastructure is no longer proposed to the north of the dwelling. Reductions to the extent of the northern array area (particularly areas immediately north and west of this viewpoint) have reduced the potential visible extent of project infrastructure from N1 (Figure 4.1). As part of project refinement, approximately 443 ha of land in the north of the northern array area has been excluded from the development footprint.

Table 5.6 Viewpoint 5 – dwelling on Old Gostwyck Road north-east of the development footprint for the northern array area

Visibility baseline assessment	The results of the viewshed analysis indicate project infrastructure within the northern array area will be visible from this location (Figure A5). As illustrated within Figure A5, shielding features in the landscape (namely remnant vegetation and planted wind breaks) have significant potential to limit the extent of project infrastructure visible from this viewpoint. The results presented in Figure A5 indicate that, based on topography alone, views of the potential substation/BESS footprint in the northern array area will be possible from the southern side of the property looking south during operations. However, accounting for shielding features in the landscape (including a significant wind break directly north of the potential substation/BESS footprint), suggests that views of this infrastructure will be screened to some degree. Photograph B.8 was selected for preparation of a photomontage (refer to Photograph C.6). Photomontages enable potential visual changes from a viewpoint to be illustrated on a photograph, with the objective of simulating the visual extent of project infrastructure, once constructed. The photomontages conservatively assume the height of the dominant project infrastructure, the PV modules, will be 4.3 m. This is a highly conservative assumption which is based on the PV module configuration illustrated in Option A within Plate 4.1. As noted in Section 4.3.1, the PV modules will likely be constructed in a single axis tracking configuration, which will allow the PV modules to rotate from east to west during the day tracking the sun's movement. The most typical configuration using single axis tracking is currently a single PV module mounted on the tracker tube in portrait (refer Option B in Plate 4.1). Therefore, the maximum height of the PV modules from the ground to the tip at the maximum tilt angle of 60^{o} is more likely to be in the range of approximately 2-3 m. Consequently, since the results of the viewshed analysis (Figure A5) and the photomontages are based on the less likely 4.3 m high configuration (ie Option A within Plate 4.1), it is likely that the actual visible extent of project infrastructure from N1 will be less than the areas shown in Figure A5 and Photograph C.6.
Magnitude of change	**Moderate** – as a result of its close proximity to the development footprint for the northern array area, N1 will be exposed to views of project infrastructure. Although shielding features in the landscape have been identified, views of project infrastructure from this viewpoint to the north-west and south will be possible during the operation of the project. The project infrastructure will add new features to the visual landscape at this location, which will result in a moderate degree of contrast to the surrounding rural setting, primarily for views to the south. It should be noted that refinements to the development footprint for the northern array area have significantly reduced the potential for views of project infrastructure to the west, north-west and north of N1. Photograph C.6 demonstrates the low magnitude of change for views from N1 looking north-west towards the development footprint for the northern array area, which is understood to be the most important aspect from the dwelling. The moderate magnitude of change assigned to this viewpoint relates to views from N1 looking south towards the development footprint for the northern array area. As noted previously, this is not the primary view from N1 and concerns around potential visibility of project infrastructure looking south have not been raised as part of targeted engagement performed to date.
Visual sensitivity	**Moderate** – due to the presence of a rural dwelling.

Table 5.6 Viewpoint 5 – dwelling on Old Gostwyck Road north-east of the development footprint for the northern array area

Evaluation of significance	**Moderate –** there will be a moderate visual impact from this viewpoint looking south. Visual impacts from this viewpoint looking south will continue throughout the life of the project. As discussed above, during targeted consultation with N1, it was noted that the preferred aspects from the dwelling were due west, north-west and north of this viewpoint. The magnitude of change for views from N1 looking north-west is illustrated in the photomontage presented in Photograph C.6 and is considered to be low.
Additional mitigation	Discussions between UPC and N1 are ongoing and include consideration of options for landscaping to address the potential visibility of project infrastructure from the southern aspect of the dwelling, should it be required. A conceptual landscaping plan has not been prepared to address the visual impact from this viewpoint as part of this assessment.

5.3.6 Viewpoint 6 – dwelling on Saumarez War Service Road north of the development footprint for the northern array area

Table 5.7 Viewpoint 6 – dwelling on Saumarez War Service Road north of the development footprint for the northern array area

Viewpoint details	This viewpoint, shown in Photograph B.10, Photograph B.11, Photograph B.12 and Photograph B.13, is within proximity of a rural dwelling owned by one the project landholders (N40). It has been considered as part of this assessment as it is currently leased to a member of the local community. At its closest point, the development footprint for the northern array area is approximately 380 m from N40. Photograph B.10 was taken approximately 80 m south of the dwelling looking south towards the development footprint for the northern array area. Photograph B.11 was taken from the same location looking north towards the dwelling (N40). Photograph B.12 was taken approximately 40 m south-west of the dwelling looking south towards the development footprint for the northern array area. Photograph B13 was taken from the same location looking north-east towards the dwelling (N40). The results of site inspections at this location indicate that there is a densely planted wind break adjacent to N40 that extends approximately 70 m from the dwelling (refer vegetation visible in Photograph B.11).
View type and context	Immediate views from this location represent a typical rural setting with a large expanse of cleared, agricultural land. Other features visible from this location include planted wind breaks, scattered remnant vegetation, Lambing Gully, farm sheds and agricultural infrastructure.
Project refinement	All land adjacent to N40 has been excluded from the northern array area. This exclusion has resulted in a buffer between N40 and the development footprint for the northern array area of approximately 390 m (Figure 4.1). As part of project refinement, approximately 443 ha of land in the north of the northern array area has been excluded from the development footprint.
Visibility baseline assessment	The results of the viewshed analysis indicate project infrastructure within the northern array area will be visible from this location (Figure A6). As illustrated within Figure A6, shielding features in the landscape have significant potential to limit the extent of project infrastructure visible from N40 (refer inset provided in Figure A6).
Magnitude of change	**Moderate** – as a result of its proximity to the development footprint for the northern array area, N40 will be exposed to views of project infrastructure. Shielding features in the landscape (namely a planted wind break adjacent to the dwelling) are likely to provide mitigation to reduce the significance of visual impacts experienced from this viewpoint during the operation of the project. Coupled with distance to the development footprint for the northern array area from this location, it is anticipated that these features will limit the scale of change and degree of contrast for views from this location.
Visual sensitivity	**Moderate** – due to the presence of a rural dwelling.
Evaluation of significance	**Moderate –** there will be a moderate visual impact from this viewpoint. Visual impacts from this viewpoint will continue throughout the life of the project.
Additional mitigation	As noted above, the rural dwelling (N40) is owned by one of the project landholders. It has been considered as part of this assessment as it is currently leased to a member of the local community. Mitigation measures (ie landscaping) south of N40 could be introduced to further reduce the visible extent of project infrastructure from N40; however, such measures will be subject to further discussions between UPC, the project landholder and the tenant at N40. A conceptual landscaping plan has not been prepared to address the potential visual impact from this viewpoint as part of this assessment.

5.3.7 Viewpoint 7 – Gostwyck Memorial Chapel and Precinct north of the development footprint for the southern array area

Table 5.8 Viewpoint 7 – Gostwyck Memorial Chapel and Precinct north of the development footprint for the southern array area

Viewpoint details	This viewpoint, shown in Photograph B.15, is within Lot 1 of DP 227322, which is the legal property description provided for Gostwyck Memorial Chapel and Precinct within the Uralla LEP. At its closest point, Gostwyck Memorial Chapel itself is approximately 1.1 km north of the development footprint for the southern array area. Photograph B15 was taken approximately 25 m south-west of Gostwyck Memorial Chapel looking south-west towards the development footprint for the southern array area. Photograph B.14 was taken from the same location looking north-east towards Gostwyck Memorial Chapel.
View type and context	The most significant elements of Gostwyck Station (ie Lot 1 of DP 227322) are those that are defined by the Gostwyck Memorial Chapel and Precinct (Figure A7). Gostwyck Memorial Chapel, shown in Photograph B.14, was built in 1921, in honour of Major Clive Dangar, who served in World War I, by his widow Ashley Clarendon Cox. It is constructed of bricks made on the historical Gostwyck Station. As shown in Photograph B.14 and Photograph B.15, rows of elm trees dominate the landscape surrounding Gostwyck Memorial Chapel. Other features visible in the landscape at this location include Gostwyck Road, Salisbury Waters, Munsies Bridge, cleared agricultural land and other built structures associated with Gostwyck Station. S8, a rural residential property, is approximately 240 m north-east of this viewpoint. As part of a review of aerial imagery and site inspections performed during this assessment, vegetation was observed around S8. This vegetation would act to screen any distant views of project infrastructure within the development footprint for the southern array area from S8.
Project refinement	Revisions to the extent of the southern array area have increased the buffer between Gostwyck Memorial Chapel and the development footprint for the southern array area from approximately 860 m (as presented as part of the PEA) to approximately 1.1 km. Reductions to the extent of the southern array area (particularly areas north of Salisbury Waters and areas excised from the southern array area due to potential flooding and biodiversity impacts) are likely to have also reduced the visible extent of project infrastructure from Gostwyck Memorial Chapel and S8.
Visibility baseline assessment	The results of the viewshed analysis indicate project infrastructure within the southern array area will be visible from this location (Figure A7). Shielding features in the landscape (namely planted elm trees within the foreground of Photograph B.15) have significant potential to limit the extent of project infrastructure visible from this viewpoint. This is evident in the output presented in Figure A7, which indicates views of project infrastructure in the southern array area would be completely obstructed from view by shielding features in the landscape. As shown in Figure A7, without the presence of shielding features in the landscape, views of the south-eastern extent of the development footprint for the central array area (at a distance of approximately 4 km) will also be possible from this viewpoint.
Magnitude of change	**Low** – it is anticipated that planted vegetation adjacent to Gostwyck Memorial Chapel and, more generally within the precinct defined in Figure A7, will limit the scale of change and degree of contrast for views from this location. In this instance, it is anticipated that the tree lined avenue of elm trees that form a significant feature in the landscape at this location will act as sufficient mitigation to reduce the potential for views of the development footprint for the southern array area from this location.

Table 5.8 Viewpoint 7 – Gostwyck Memorial Chapel and Precinct north of the development footprint for the southern array area

Visual sensitivity	**High** – due to the presence of a local heritage item listed on Schedule 5 of the Uralla LEP.
Evaluation of significance	**Moderate** – due to the high visual sensitivity of this viewpoint, the evaluation of significance provided as part of this assessment is moderate; however, there would not be a significant impact from this viewpoint. Visual impacts from this viewpoint will continue throughout the life of the project; however, planted vegetation adjacent to Gostwyck Memorial Chapel and, more generally within the precinct defined in Figure A7, will limit the visibility of project infrastructure from this location.
Additional mitigation	No additional mitigation measures are warranted based on the evaluation of significance.

5.3.8 Viewpoint 8 – Deeargee Woolshed and Hillview Road north-east of the development footprint for the southern array area

Table 5.9 Viewpoint 8 – Deeargee Woolshed and Hillview Road north-east of the development footprint for the southern array area

Viewpoint details	This viewpoint, shown in Photograph B.17, is adjacent to Hillview Road and Lot 3 of DP 1122757, which is the legal property description provided for Deeargee Woolshed within the Uralla LEP. At its closest point, Deeargee Woolshed itself is approximately 970 m north-east of the development footprint for the southern array area. Photograph B.17 was taken approximately 170 m south-west of Deeargee Woolshed looking south-west towards the development footprint for the southern array area. Photograph B.16 was taken from the same location looking north-east towards Deeargee Woolshed. Photograph B.18 was taken approximately 140 m south-west of Photograph B16 and Photograph B17 looking north-east towards Deeargee Woolshed and a stand of remnant vegetation in the landscape. It was taken adjacent to the potential site access corridor to connect the southern array area to Hillview Road.
View type and context	The most significant element of Deeargee Station (ie Lot 3 of DP 1122757) is Deeargee Woolshed (Figure A8 and Photograph B.16). Deeargee Station was originally part of Gostwyck Station. In 1969, Gostwyck was divided along Salisbury Waters; the historic woolshed on the east side became Deeargee and Gostwyck Station retained the homestead on the west bank of Salisbury Waters. Deeargee Woolshed was built in 1851, before it burnt down and was subsequently rebuilt by Alexander Mitchell in 1868. There are conflicting reports regarding the subsequent works on Deeargee Woolshed; but it is clear that further works continued into the early 1900s. The unique structure allows the maximum amount of light possible while being well ventilated. Other features visible in the landscape at this location include Hillview Road, Salisbury Waters, cleared agricultural land and other farm sheds and agricultural infrastructure associated with Deeargee Station.
Project refinement	Revisions to the extent of the southern array area have increased the buffer between Deeargee Woolshed and the development footprint for the southern array area from approximately 690 m (as presented as part of the PEA) to approximately 970 m (Figure 4.1). Reductions to the extent of the southern array area (particularly areas north of Salisbury Waters and areas excised from the southern array area due to potential flooding and biodiversity impacts) are likely to have also reduced the visible extent of project infrastructure from Deeargee Woolshed (Figure 4.1).
Visibility baseline assessment	The results of the viewshed analysis indicate project infrastructure within the southern array area will be visible from this location (Figure A8). As illustrated within Figure A8, shielding features in the landscape have the potential to partially screen the extent of project infrastructure visible from this viewpoint. As shown in Photograph B.17 and Photograph B18, the views of project infrastructure from this location would be interrupted by a patch of remnant vegetation within the landscape between Deeargee Woolshed and the development footprint for the southern array area.
Magnitude of change	**Low** – it is anticipated that the patch of remnant vegetation shown in Photograph B.17 and Photograph B18 will partially screen the extent of project infrastructure visible from this viewpoint and limit the scale of change and degree of contrast for views from this location. Project infrastructure will not be the primary view from this viewpoint for motorists travelling along Hillview Road, as it is assumed the focus of motorists will be in line with their direction of travel along this local road corridor.

Table 5.9 Viewpoint 8 – Deeargee Woolshed and Hillview Road north-east of the development footprint for the southern array area

Visual sensitivity	**High** – due to the presence of a local heritage item listed on Schedule 5 of the Uralla LEP.
Evaluation of significance	**Moderate** – due to the high visual sensitivity of this viewpoint, the evaluation of significance provided as part of this assessment is moderate; however, there would not be a significant impact from this viewpoint. Visual impacts from this viewpoint will continue throughout the life of the project; however, the patch of remnant vegetation shown in Photograph B.17 and Photograph B18 will mitigate the visibility of project infrastructure from this location.
Additional mitigation	No additional mitigation measures are warranted based on the evaluation of significance.

5.3.9 Viewpoint 9 – Gostwyck Road north of the development footprint for the southern array area

Table 5.10 Viewpoint 9 – Gostwyck Road north of the development footprint for the southern array area

Viewpoint details	This viewpoint, shown in Photograph B.19, is on the southern side of Gostwyck Road at an elevated location looking south towards the development footprint for the southern array area. Photograph B.19 was taken from the road shoulder approximately 1.3 km north of the development footprint for the southern array area.
View type and context	As shown in Figure A9 and illustrated in Photograph B.19, this location is a high point in the landscape with sweeping views across a characteristically rural landscape. In addition to large expanses of cleared agricultural land, other features in the landscape at this location include remnant vegetation, Gostwyck Road and Essential Energy's existing 66 kV sub-transmission line and supporting structures.
Project refinement	Revisions to the extent of the southern array area have increased the distance between this viewpoint and the development footprint for the southern array area from approximately 900 m (as presented as part of the PEA) to approximately 1.3 km (Figure 4.1). Reductions to the extent of the southern array area (particularly areas north of Salisbury Waters and areas excised from the southern array area due to potential flooding and biodiversity impacts) are likely to have also reduced the visible extent of project infrastructure from this viewpoint (Figure 4.1).
Visibility baseline assessment	The results of the viewshed analysis indicate project infrastructure within the southern array area will be visible from this location (Figure A9). As illustrated within Figure A9, shielding features in the landscape have the potential to partially screen the extent of project infrastructure visible from this viewpoint. As shown in Photograph B.19, the distant views of project infrastructure from this location would be interrupted by scattered vegetation within the landscape between Gostwyck Road and the development footprint for the southern array area.
Magnitude of change	**Low** – the distance to the development footprint from this location will limit the scale of change and degree of contrast for views from this location. In addition, project infrastructure will not be the primary view from this viewpoint, as it is assumed the focus of motorists will be in line with their direction of travel along Gostwyck Road.
Visual sensitivity	**Low** – due to its agricultural landscape character, absence of sensitive land use designations (RU1 Primary Production) and status as a tourist road.
Evaluation of significance	**Slight** – there would not be a significant impact from this viewpoint. Visual impacts from this viewpoint will continue throughout the life of the project.
Additional mitigation	No additional mitigation measures are warranted based on the evaluation of significance.

5.3.10 Viewpoint 10 – Gostwyck War Service Road and dwelling south-east of the development footprint for the central array area

Table 5.11 Viewpoint 10 – Gostwyck War Service Road and dwelling south-east of the central array area

Viewpoint details	This viewpoint, shown in Photograph B.20, is on Gostwyck War Service Road looking north-west towards the development footprint for the central array area. Photograph B.20 was taken from the western road shoulder approximately 2.3 km from the south-eastern boundary of the development footprint for the central array area. This viewpoint is approximately 430 m south-west of a dwelling (C6). C6 is approximately 2.3 km south-east of the development footprint for the central array area.
View type and context	Views from this location represent a typical rural setting with a predominantly flat expanse of relatively cleared agricultural land in the foreground. Low rolling hills, planted wind breaks and remnant vegetation are visible in the distance. Other features in the landscape at this location include Salisbury Waters, Essential Energy's 66 kV sub-transmission line and supporting structures, farm sheds and agricultural infrastructure. A review of aerial imagery and the results of site investigations indicate that there is vegetation present around C6. This vegetation would act to screen any distant views of project infrastructure within the development footprint for the central array area.
Project refinement	Although the distance to the development footprint for the central array area from this viewpoint has not changed, reductions to the extent of the central array area are likely to have reduced the visible extent of project infrastructure from Gostwyck War Service Road and C6 (Figure 4.1).
Visibility baseline assessment	The results of the viewshed analysis indicate project infrastructure within the central array area will be visible from this location (Figure A10). As illustrated within Figure A10, shielding features in the landscape have potential to screen the extent of project infrastructure visible from this viewpoint. As shown in Photograph B.20, the distant views of project infrastructure from this location would be interrupted by scattered vegetation and planted wind breaks within the landscape between Gostwyck War Service Road and the development footprint for the central array area.
Magnitude of change	**Low** – the distance to the development footprint for the central array area from this location will limit the scale of change and degree of contrast for views from this location. Project infrastructure will not be the primary view from this viewpoint for motorists travelling along Gostwyck War Service Road, as it is assumed the focus of motorists will be in line with their direction of travel along Gostwyck War Service Road.
Visual sensitivity	**Moderate** – due to the presence of a rural dwelling.
Evaluation of significance	**Slight/Moderate** – there would not be a significant impact from this viewpoint. Visual impacts from this viewpoint will continue throughout the life of the project.
Additional mitigation	No additional mitigation measures are warranted based on the evaluation of significance.

5.3.11 Viewpoint 11 – Elliots Road and dwelling east of the development footprint for the central array area

Table 5.12 Viewpoint 11 – Elliots Road and dwelling east of the development footprint for the central array area

Viewpoint details	This viewpoint, shown in Photograph B.21, is close to the end of Elliots Road looking south-west towards the development footprint for the central array area. Photograph B.21 was taken from the northern road shoulder approximately 2 km from the south-eastern boundary of the development footprint for the central array area. This viewpoint is approximately 380 m east of a dwelling (C5 – refer Photograph B.21). C5 is approximately 1.7 km north-east of the development footprint for the central array area.
View type and context	Views from this location represent a typical rural setting characterised by cleared agricultural land, low rolling hills, planted wind breaks and remnant vegetation. Other features in the landscape at this location include Salisbury Waters, Essential Energy's 66 kV sub-transmission line and supporting structures (refer Photograph B.20), farm dams and agricultural infrastructure. A review of aerial imagery and the results of site investigations indicate that there is vegetation present around C5. This vegetation would act to screen views of project infrastructure within the development footprint for the central array area.
Project refinement	Although the distance to the development footprint for the central array area from this viewpoint has not changed, reductions to the extent of the central array area are likely to have reduced the visible extent of project infrastructure from Elliots Road and C5 (Figure 4.1).
Visibility baseline assessment	The results of the viewshed analysis indicate project infrastructure within the central array area will be visible from this location (Figure A11). As illustrated within Figure A11, shielding features in the landscape (namely planted wind breaks and remnant vegetation) have the potential to partially screen the extent of project infrastructure visible from this viewpoint. As shown in Photograph B.21, the distant views of project infrastructure from this location would be interrupted by scattered vegetation and planted wind breaks within the landscape between Elliots Road and the development footprint for the central array area. The results of the viewshed analysis also indicate potential for distant views from this viewpoint towards the development footprint for the northern array area. As shown in Figure A.11, the closest visible project infrastructure in the northern array area is anticipated to be at a distance of greater than 3.5 km from both Viewpoint 11 and C5. A review of aerial imagery and the results of the viewshed analysis presented in Figure A.11 indicate that planted wind breaks, remnant vegetation and undulation in the landscape would partially screen the extent of project infrastructure in the northern array area visible from Viewpoint 11 and C5.
Magnitude of change	**Low** – the distance to the development footprint for the northern and central array areas from this location will limit the scale of change and degree of contrast for views from this location. Project infrastructure will not be the primary view from this viewpoint for motorists travelling along Elliots Road, as it is assumed the focus of motorists will be in line with their direction of travel along Elliots Road.
Visual sensitivity	**Moderate** – due to the presence of a rural dwelling.
Evaluation of significance	**Slight/Moderate** – there would not be a significant impact from this viewpoint. Visual impacts from this viewpoint will continue throughout the life of the project.
Additional mitigation	No additional mitigation measures are warranted based on the evaluation of significance.

5.3.12 Viewpoint 12 – Thunderbolts Way west of the development footprint for the southern array area

Table 5.13 Viewpoint 12 - Thunderbolts Way west of the development footprint for the southern array area

Viewpoint details	This viewpoint, shown in Photograph B.22, is on the eastern side of Thunderbolts Way at an elevated location looking south-east towards the development footprint for the southern array area. Photograph B.22 was taken from the eastern road shoulder approximately 1.9 km from the western boundary of a parcel of land that makes up part of the development footprint for the southern array area.
View type and context	As shown in Figure A12 and illustrated in Photograph B.22, this location is a high point in the landscape with sweeping views across a characteristically rural landscape. In addition to large expanses of cleared agricultural land, other features in the landscape at this location include planted wind breaks and remnant vegetation, other rural residential dwellings and infrastructure to support agricultural operations.
Project refinement	Although the distance to the development footprint for the southern array area from this viewpoint has only reduced by less than 100 m, reductions to the extent of the southern array area (particularly areas excised from the southern array area due to potential flooding impacts) are likely to have reduced the visible extent of project infrastructure from this viewpoint (Figure 4.1).
Visibility baseline assessment	The results of the viewshed analysis indicate project infrastructure within the southern array area will be visible from this location (Figure A12). As illustrated within Figure A12, shielding features in the landscape have the potential to partially screen the extent of project infrastructure visible from this viewpoint. As shown in Photograph B.22, distant views of project infrastructure from this location would be interrupted by scattered vegetation within the landscape between Thunderbolts Way and the development footprint for the southern array area.
Magnitude of change	**Low** – the distance to the development footprint from this location will limit the scale of change and degree of contrast for views from this location. In addition, project infrastructure will not be the primary view from this viewpoint, as it is assumed the focus of motorists will be in line with their direction of travel along Thunderbolts Way.
Visual sensitivity	**Low** – due to its agricultural landscape character, absence of sensitive land use designations (RU1 Primary Production) and status as a main road.
Evaluation of significance	**Slight** – there would not be a significant impact from this viewpoint. Visual impacts from this viewpoint will continue throughout the life of the project.
Additional mitigation	No additional mitigation measures are warranted based on the evaluation of significance.

5.3.13 Viewpoint 13 – intersection of Thunderbolts Way and Salisbury Plains Road adjacent to the development footprint for the southern array area

Table 5.14 Viewpoint 13 – intersection of Thunderbolts Way and Salisbury Plains Road adjacent to the development footprint for the southern array area

Viewpoint details	This viewpoint, shown in Photograph B.23 is the intersection of Thunderbolts Way and Salisbury Plains Road looking north-east towards the development footprint for the southern array area. Photograph B.23 was taken from the southern corner of the intersection of Thunderbolts Way and Salisbury Plains Road approximately 25 m from the development footprint for the southern array area. This viewpoint is adjacent to Thunderbolts Way and Lot 1 of DP 1030870, which is the legal property description provided for Salisbury Court within the Uralla LEP (refer Figure 5.4). At its closest point, the development footprint for the southern array area is approximately 900 m east of the primary dwelling on Lot 1 of DP 103870 (ie S16 – Salisbury Court homestead). As part of the preparation of this report, access to Lot 1 of DP 103870 was not requested. Subsequently, the location of Viewpoint 13 was selected as it was considered representative of: - potential views from motorists travelling along Thunderbolts Way; - potential views from motorists turning into Salisbury Plains Road from Thunderbolts Way; - potential views from vehicles entering and exiting the driveway to Salisbury Court; and - a number of receptors (ie dwellings) off Thunderbolts Way (S17, S19, S20 and S22 – refer Figure 5.4). The distance between these receptors and the development footprint for the southern array area are variable and range from between 600 m (S17) and 2.1 km (S19). The assessment of the magnitude of change and visual sensitivity and subsequent evaluation of significance from this viewpoint has considered: - motorists travelling along Thunderbolts Way; - Salisbury Court (ie S16 – Salisbury Court homestead); and - S17 as the closest non-project related receptor on the southern side of Thunderbolts Way.
View type and context	Salisbury Court homestead (S16 within Lot 1 of DP 1030870) is regarded as the earliest stone homestead still standing in New England and was built in 1845. The homestead is in its original form and has been well-maintained over the years. A review of aerial imagery and the results of site investigations indicate that there is a significant amount of vegetation present around Salisbury Court homestead (S16). This vegetation would act to screen any views of project infrastructure within the development footprint for the southern array area. S17 is a rental property used seasonally by shearers employed by a neighbouring agricultural operation and has, at times, been occupied by full-time tenants. As part of the preparation of this report, representatives from UPC met with the landholder at the rental property and captured photographs from the property looking north-east and east towards the development footprint for the southern array area (refer Photograph B.24 and Photograph B.25). The results of the site investigations indicate that remnant vegetation, roadside vegetation along Thunderbolts Way and planted wind breaks would act to obstruct views of project infrastructure within the development footprint for the southern array area. Aerial imagery also suggests that there is vegetation present around other dwellings within proximity of this viewpoint (ie S19, S20 and S22). Features in the landscape at this viewpoint location include major and minor roads (ie Thunderbolts Way and Salisbury Plains Road, respectively), cleared agricultural land, planted vegetation (including along the driveway entrance to Salisbury Court and along the southern boundary of the development footprint of the southern array area adjacent to Thunderbolts Way) and Salisbury Waters.
Project refinement	Not applicable. There have not been any refinements to the extent of the development footprint for the southern array area within proximity of this viewpoint.

Table 5.14 Viewpoint 13 – intersection of Thunderbolts Way and Salisbury Plains Road adjacent to the development footprint for the southern array area

Visibility baseline assessment	The results of the viewshed analysis indicate project infrastructure within the southern array area will be visible from this Viewpoint 13 (Figure A13). As illustrated within Figure A13, shielding features in the landscape (namely planted vegetation along the southern boundary of the southern array area) are likely to limit the extent of project infrastructure visible from this viewpoint.
Magnitude of change	*Thunderbolts Way* **Moderate** – while the project infrastructure will add new features to the visual landscape, views will be predominantly from motorists travelling along Thunderbolts Way. Assuming that motorists are travelling at the prescribed speed limit of 100 km/h along Thunderbolts Way, it is estimated that travelling motorists would be exposed to views of project infrastructure for no more than 72 seconds over a distance of approximately 2 km. In addition project infrastructure will not be the primary view from this viewpoint as it is assumed the focus of motorists will be in line with their direction of travel along Thunderbolts Way. Roadside vegetation is not expected to be impacted at this location. *Salisbury Court* **Low** – as noted above, Salisbury Court homestead (S16), an item of local heritage significance listed within the Uralla LEP, is approximately 900 m west of the development footprint for the southern array area. Vegetation around Salisbury Court homestead is anticipated to shield views of project infrastructure within the development footprint for the southern array area. Therefore, the magnitude of change from Salisbury Court is considered to be low. *S17 – Rental property off Thunderbolts Way* **Low –** as a result of its proximity to the development footprint for the southern array area, S17 may be exposed to views of project infrastructure; however, shielding features in the landscape (namely remnant vegetation, roadside vegetation along Thunderbolts Way and planted wind breaks) are likely to provide mitigation to reduce the significance of visual impacts experienced from S17 during the operation of the project. Coupled with distance to the development footprint for the southern array area from this location and the primary aspect from the dwelling, it is anticipated that these features will limit the scale of change and degree of contrast for views from this location.
Visual sensitivity	*Thunderbolts Way* **Low –** due to its agricultural landscape character, absence of sensitive land use designations (RU1 Primary Production) and status as a main road. *Salisbury Court* **High** – due to the presence of a local heritage item listed on Schedule 5 of the Uralla LEP. *S17 – Rental property off Thunderbolts Way* **Moderate** – due to the presence of a rural dwelling.
Evaluation of significance	*Thunderbolts Way* **Slight/moderate –** there would not be a significant impact from this viewpoint. Visual impacts from this viewpoint will continue throughout the life of the project. *Salisbury Court* **Moderate** - due to the high visual sensitivity of Salisbury Court, the evaluation of significance provided as part of this assessment is moderate; however, there would not be a significant visual impact from Salisbury Court. *S17 – Rental property off Thunderbolts Way* **Slight/moderate** – there would not be a significant impact from this viewpoint. Visual impacts from this viewpoint will continue throughout the life of the project.
Additional mitigation	Planted vegetation along the southern boundary of the development footprint of the southern array area (adjacent to Thunderbolts Way) is not expected to be impacted by the project. Retaining this vegetation will provide partial screening of views of project infrastructure within the development footprint for the southern array area that may be experienced by motorists travelling along Thunderbolts Way and residents at S17. No additional mitigation measures are warranted based on the evaluation of significance.

5.3.14 Viewpoint 14 – New England Highway north-west of the development footprint for the northern array area

Table 5.15 Viewpoint 14 – New England Highway north-west of the development footprint for the northern array area

Viewpoint details	This viewpoint, shown in Photograph B.26, is on the eastern side of the New England Highway looking south-east towards the development footprint for the northern array area. Photograph B.26 was taken from the road shoulder approximately 2.4 km from the northern boundary of the development footprint for the northern array area.
View type and context	Views from this location represent a typical rural setting with a predominantly flat expanse of relatively cleared agricultural land. Low rolling hills and denser remnant vegetation are visible in the distance. The Main Northern Railway line traverses the landscape between this viewpoint and the northern array area.
Project refinement	Although the distance to the development footprint for the northern array area from this viewpoint has not changed, reductions to the extent of the northern array area are likely to have reduced the visible extent of project infrastructure from this viewpoint (Figure 4.1). As part of project refinement, approximately 443 ha of land in the north of the northern array area has been excluded from the development footprint.
Visibility baseline assessment	The results of the viewshed analysis indicate project infrastructure within the northern array area will be visible from this location (Figure A14). As illustrated within Figure A14, shielding features in the landscape have the potential to partially screen the extent of project infrastructure visible from this viewpoint. As shown in Photograph B.26, the distant views of project infrastructure from this location would be interrupted by scattered vegetation within the landscape between the New England Highway and the development footprint for the northern array area.
Magnitude of change	**Low** – the distance to the development footprint from this location will limit the scale of change and degree of contrast for views from this location. In addition, project infrastructure will not be the primary view from this viewpoint, as it is assumed the focus of motorists will be in line with their direction of travel along the New England Highway.
Visual sensitivity	**Low** – due to its agricultural landscape character, absence of sensitive land use designations (RU1 Primary Production) and status as a state highway.
Evaluation of significance	**Slight** – there would not be a significant impact from this viewpoint. Visual impacts from this viewpoint will continue throughout the life of the project.
Additional mitigation	No additional mitigation measures are warranted based on the evaluation of significance.

5.3.15 Viewpoint 15 – dwellings on Saumarez War Service Road north of the development footprint for the northern array area

Table 5.16 Viewpoint 15 – dwellings on Saumarez War Service Road north of the development footprint for the northern array area

Viewpoint details	This viewpoint, shown in Photograph B.27, is on Saumarez War Service Road looking south towards the development footprint for the northern array area. Photograph B.27 was taken from the middle of the road approximately 2.4 km from the northern boundary of the development footprint for the northern array area. Viewpoint 15 is considered representative of views from N41, N42, N43 and N44. The closest of these dwellings to the development footprint for the northern array area (N41) is approximately 2.5 km north-west (Figure A15).
View type and context	Views from this location represent a typical rural setting with a predominantly flat expanse of relatively cleared agricultural land. Low rolling hills and planted wind breaks are visible in the distance. The Main Northern Railway line traverses the landscape between this viewpoint and the northern array area. A review of aerial imagery and the results of site investigations indicate that there is vegetation present around a number of the dwellings within close proximity of this viewpoint (including dwellings on Saumarez War Service Road and Tuberosa Road). This vegetation would act to screen any distant views of project infrastructure within the development footprint for the northern array area.
Project refinement	Although the distance to the development footprint for the northern array area from this viewpoint has not changed, reductions to the extent of the northern array area are likely to have reduced the visible extent of project infrastructure from this viewpoint (Figure 4.1). As part of project refinement, approximately 443 ha of land in the north of the northern array area has been excluded from the development footprint.
Visibility baseline assessment	The results of the viewshed analysis indicate project infrastructure within the northern array area will be visible from this viewpoint (Figure A15). As illustrated within Figure A15, shielding features in the landscape have the potential to partially screen the extent of project infrastructure visible from this viewpoint. As shown in Photograph B.27, the distant views of project infrastructure from this location would be interrupted by scattered vegetation and planted wind breaks within the landscape between Saumarez War Service Road and the development footprint for the northern array area.
Magnitude of change	**Low** – the distance to the development footprint from this location will limit the scale of change and degree of contrast for views from this location. Project infrastructure will not be the primary view from this viewpoint for motorists travelling along Saumarez War Service Road, as it is assumed the focus of motorists will be in line with their direction of travel along Saumarez War Service Road.
Visual sensitivity	**Moderate** – due to the presence of rural dwellings.
Evaluation of significance	**Slight/Moderate** – there would not be a significant impact from this viewpoint. Visual impacts from this viewpoint will continue throughout the life of the project.
Additional mitigation	No additional mitigation measures are warranted based on the evaluation of significance.

5.3.16 Viewpoint 16 – dwellings on Burns Road north of the development footprint for the northern array area

Table 5.17 Viewpoint 16 – dwellings on Burns Road north of the development footprint for the northern array area

Viewpoint details	This viewpoint, shown in Photograph B.28, is at the southern extent of Burns Road looking south towards the development footprint for the northern array area. Photograph B.28 was taken from the cul-de-sac approximately 2.5 km from the northern boundary of the development footprint for the northern array area. Viewpoint 16 is considered representative of views from N24, N25, N26 and N27. Photograph B.29 was taken approximately 400 m north of Viewpoint 16 and is considered representative of views towards the development footprint for the northern array area for dwellings further north along Burns Road.
View type and context	Views from this location represent a typical rural setting with a predominantly flat expanse of relatively cleared agricultural land. Low rolling hills, planted wind breaks and Saumarez Creek are visible in the distance. The Main Northern Railway line traverses the landscape between this viewpoint and the northern array area. A review of aerial imagery and the results of site investigations indicate that there is vegetation present around a number of the dwellings within close proximity of this viewpoint. This vegetation would act to screen any distant views of project infrastructure within the development footprint for the northern array area.
Project refinement	The exclusion of land in the north of the northern array area has increased the buffer between this viewpoint and the development footprint for the northern array area from approximately 560 m (as presented as part of the PEA) to approximately 2.5 km (Figure 4.1). Reductions to the extent of the northern array area will have reduced the potential visible extent of project infrastructure from receptors close to this viewpoint (Figure 4.1). As part of project refinement, approximately 443 ha of land in the north of the northern array area has been excluded from the development footprint.
Visibility baseline assessment	The results of the viewshed analysis indicate project infrastructure within the northern array area will be visible from this location (Figure A16). As illustrated within Figure A16, shielding features in the landscape have the potential to partially screen the extent of project infrastructure visible from this viewpoint. As shown in Photograph B.28, the distant views of project infrastructure from this location (as well as further north along Burns Road – Photograph B.29) would be interrupted by scattered vegetation and planted wind breaks within the landscape between dwellings on Burns Road and the development footprint for the northern array area.
Magnitude of change	**Low** – the distance to the development footprint from this location will limit the scale of change and degree of contrast for views from this location.
Visual sensitivity	**Moderate** – due to the presence of rural dwellings.
Evaluation of significance	**Slight/Moderate** – there would not be a significant impact from this viewpoint. Visual impacts from this viewpoint will continue throughout the life of the project.
Additional mitigation	No additional mitigation measures are warranted based on the evaluation of significance.

5.3.17 Viewpoint 17 – dwellings on Heathersleigh Road north-east of the development footprint for the northern array area

Table 5.18 Viewpoint 17 – dwellings on Heathersleigh Road north-east of the development footprint for the northern array area

Viewpoint details	This viewpoint, shown in Photograph B.30, is on a crest along the alignment of Heathersleigh Road looking south-west towards the development footprint for the northern array area. Photograph B.30 was taken from the southern road shoulder approximately 2.1 km north-east of the development footprint for the northern array area. Viewpoint 17 is considered representative of views from N28, 29, 30, 31, 32 and 33. Photograph B.31 was taken approximately 450 m south-west of Viewpoint 17 and is considered representative of views towards the development footprint for the northern array area for dwellings further west along Heathersleigh Road (ie N20, N21, N22 and N23).
View type and context	As shown in Figure A17 and illustrated in Photograph B.30, this viewpoint is at a high point in the landscape with sweeping views across a characteristically rural landscape. Low rolling hills, scattered vegetation, planted wind breaks and Saumarez Creek are visible in the distance. In addition, a number of rural residential dwellings and infrastructure to support agricultural operations can also be seen from this viewpoint. A review of aerial imagery and the results of site investigations indicate that there is vegetation present around a number of the dwellings within close proximity of this viewpoint. This vegetation would act to screen any distant views of project infrastructure within the development footprint for the northern array area.
Project refinement	The exclusion of land in the north of the northern array area has increased the buffer between this viewpoint and the development footprint for the northern array area from approximately 920 m (as presented as part of the PEA) to approximately 2.1 km (Figure 4.1). Reductions to the extent of the northern array area will have reduced the visible extent of project infrastructure from dwellings close to this viewpoint (Figure 4.1). As part of project refinement, approximately 443 ha of land in the north of the northern array area has been excluded from the development footprint.
Visibility baseline assessment	The results of the viewshed analysis indicate project infrastructure within the northern array area will be visible from this location (Figure A18). As illustrated within Figure A18, shielding features in the landscape have the potential to partially screen the extent of project infrastructure visible from this viewpoint. As shown in Photograph B.30, the distant views of project infrastructure from this location (as well as from the gully shown in Photograph B.31) would be interrupted by scattered vegetation and planted wind breaks within the landscape between dwellings on Heathersleigh Road and the development footprint for the northern array area.
Magnitude of change	**Low** – the distance to the development footprint from this location will limit the scale of change and degree of contrast for views from this location.
Visual sensitivity	**Moderate** – due to the presence of rural dwellings.
Evaluation of significance	**Slight/moderate**– there would not be a significant impact from this viewpoint. Visual impacts from this viewpoint will continue throughout the life of the project.
Additional mitigation	No additional mitigation measures are warranted based on the evaluation of significance.

5.3.18 Viewpoint 18 – dwellings on Hariet Gully Road north-east of the development footprint for the northern array area

Table 5.19 Viewpoint 18 – dwellings on Hariet Gully Road north-east of the development footprint for the northern array area

Viewpoint details	This viewpoint, shown in Photograph B.32, is at the western extent of Hariet Gully Road looking south-west towards the development footprint for the northern array area. Photograph B.32 was taken from the cul-de-sac approximately 1.1 km from the development footprint for the northern array area. Viewpoint 18 is considered representative of views from N10, N11, N12, N13, N14, N15, N16, N17, N18 and N19.
View type and context	There are a number of rural residential properties within proximity of this viewpoint. Views from this location represent a typical rural residential setting with planted vegetation prominent in the foreground. A review of aerial imagery and the results of site investigations indicate that there is vegetation present around a number of the dwellings within close proximity of this viewpoint. This vegetation would act to screen any views of project infrastructure within the development footprint for the northern array area.
Project refinement	The exclusion of land in the north of the northern array area has increased the buffer between this viewpoint and the development footprint for the northern array area from approximately 300 m (as presented as part of the PEA) to approximately 1.1 km (Figure 4.1). Reductions to the extent of the northern array area will have reduced the potential visible extent of project infrastructure from receptors close to this viewpoint (Figure 4.1). As part of project refinement, approximately 443 ha of land in the north of the northern array area has been excluded from the development footprint.
Visibility baseline assessment	Despite the relative proximity of this viewpoint to the development footprint for the northern array area (approximately 1 km), the results of the viewshed analysis indicate that project infrastructure within the northern array area will not be visible from this location (Figure A18). This is due to undulation in the landscape between this location and the development footprint for the northern array area. This undulation is visible in Photograph B.32 where elevation is seen to increase towards the south-west. This can also be seen by the contours presented on Figure A18.
Magnitude of change	**Negligible –** it is unlikely that dwellings off Hariet Gully Road within proximity of this viewpoint will experience views of the project infrastructure due to undulation in the landscape between this location and the development footprint for the northern array area. In addition, as noted above, vegetation present around a number of the dwellings within close proximity of this viewpoint would further act to screen any potential views of project infrastructure.
Visual sensitivity	**Moderate** – due to the presence of rural dwellings.
Evaluation of significance	**Slight** – there would not be a significant impact from this viewpoint. Visual impacts from this viewpoint will continue throughout the life of the project.
Additional mitigation	No additional mitigation measures are warranted based on the evaluation of significance.

5.3.19 Viewpoint 19 – dwellings on Corey Road north-east of the development footprint for the northern array area

Table 5.20 Viewpoint 19 – dwellings on Corey Road north-east of the development footprint for the northern array area

Viewpoint details	This viewpoint, shown in Photograph B.33, is at the western extent of Corey Road looking west towards the development footprint for the northern array area. Photograph B.33 was taken from the cul-de-sac approximately 1 km from the development footprint for the northern array area. Viewpoint 19 is considered representative of views from N2, N3, N4, N5, N6 and N7.
View type and context	There are a number of rural residential properties within proximity of this viewpoint. Views from this location represent a typical rural residential setting with planted vegetation prominent in the foreground. A review of aerial imagery and the results of site investigations indicate that there is vegetation present around a number of the dwellings within close proximity of this viewpoint. This vegetation would act to screen any views of project infrastructure within the development footprint for the northern array area.
Project refinement	The exclusion of land in the north of the northern array area has increased the buffer between this viewpoint and the development footprint for the northern array area from approximately 260 m (as presented as part of the PEA) to approximately 1 km (Figure 4.1). Reductions to the extent of the northern array area will have reduced the potential visible extent of project infrastructure from receptors close to this viewpoint (Figure 4.1). As part of project refinement, approximately 443 ha of land in the north of the northern array area has been excluded from the development footprint.
Visibility baseline assessment	Despite the relative proximity of this viewpoint to the development footprint for the northern array area (approximately 1 km), the results of the viewshed analysis indicate that project infrastructure within the northern array area will not be visible from this location (Figure A19). This is due to undulation in the landscape between this location and the development footprint for the northern array area. This undulation is visible in Photograph B.33 where elevation is seen to increase towards the west. This can also be seen by the contours presented on Figure A19.
Magnitude of change	**Negligible –** it is unlikely that dwellings off Corey Road within proximity of this viewpoint will experience views of the project infrastructure due to undulation in the landscape between this location and the development footprint for the northern array area. In addition, as noted above, vegetation present around a number of the dwellings within close proximity of this viewpoint would further act to screen any potential views of project infrastructure.
Visual sensitivity	**Moderate** – due to the presence of rural dwellings.
Evaluation of significance	**Slight** – there would not be a significant impact from this viewpoint. Visual impacts from this viewpoint will continue throughout the life of the project.
Additional mitigation	No additional mitigation measures are warranted based on the evaluation of significance.

5.4 Reflectivity and glare

Reference materials from the NSW Government's Department of Industry Division of Resources and Energy (2016), Solar Trade Association (2016) and the Federal Aviation Administration of the United States (2010) indicate that, in general, as little as 2% of the light received is reflected by PV modules. As noted by both the Federal Aviation Administration of the United States (FAA 2010) and Spaven Consulting (2011), this degree of reflectivity is less than the reflectivity produced by a wide variety of different surfaces, including surfaces within the immediate vicinity of the three arrays areas, such as bare soil and vegetation, and is similar to the reflectivity of smooth bodies of water, such as Dangars Lagoon (approximately 4.2 km north-west of the southern array area). Further, the NSW Department of Planning (2010) acknowledged in a discussion paper on solar energy technology that potential for glare associated with non-concentrating PV solar systems is relatively limited and PV modules will not generally create noticeable glare when compared with an existing roof or building surface.

The potential impacts of reflectivity on receptors, primarily dwellings within proximity of the development footprint, motorists travelling along the local and regional road network and visitors to items of local heritage significance within proximity of the southern array area, are glint and glare.

Glint refers to shorter period and more intense levels of exposure, while glare refers to sustained or continuous periods of exposure to excessive brightness, but at a reduced level of intensity (Morelli 2014). The amount of glint and glare produced by a PV module is variable and is dependent on the angle of the PV modules, with lower angles producing less glint and glare (Morelli 2014).

As described in Section 4.3, the project's PV modules will likely be constructed in a single axis tracking configuration. This configuration will allow the PV modules to rotate from east to west during the day tracking the sun's movement. Consequently, the degree of glint and glare experienced by receptors will be variable depending on the time of day and viewing location. For example, receptors west of the development footprint for the three array areas will only have potential to be impacted by glint and glare during the afternoon tracking period. However, as noted above, as little as 2% of the light received is reflected by PV modules, which is less than the reflectivity produced by a wide variety of surfaces in the existing environment surrounding and within the development footprint.

Reflection in the form of glint and glare will only be possible when direct sunlight occurs, therefore, in those instances where glint and glare from the PV modules may occur, receptors will also likely experience direct sunlight, which will be a significantly brighter and more intense source of light than reflection from the PV modules within the three array areas. Nonetheless, glint and glare may result from the project and may have an impact on receptors, primarily dwellings within proximity of the development footprint, motorists travelling along the local and regional road network, and visitors to items of local heritage significance within proximity of the southern array area. As discussed in Section 5.3, undulation within the landscape, favourable topography and existing remnant vegetation in the landscape (including planted wind breaks) will reduce both the duration and location from which reflection from the PV modules may be visible. Further, the intention of the proposed landscaping at S9 (refer to Section 4.5.1) is to reduce the visibility of PV modules and other project infrastructure at this location, which will also mitigate any potential for glint or glare impacts.

In addition to the PV modules, other project infrastructure may also result in glint and glare depending on the angle of the sun and viewing location. For example, glint and glare may occur as a result of the mounting frameworks to support the PV modules, perimeter security fencing, BESS housing, O&M infrastructure and PCUs. This infrastructure will be more sparsely dispersed within the three array areas and is unlikely to create noticeable glint or glare when compared with existing structures within the development footprint for the three array areas (eg agricultural sheds and wire fencing). In addition, as part of the project refinement process, potential substation and BESS footprints within the three array areas have been positioned as far from the closest receptors as possible.

Spaven Consulting (2011) prepared a report to assess the potential impact of PV solar energy facilities located in off-airfield situations. Within this report, the potential for glare to pilots caused by sunlight reflected by PV modules was identified as the only significant aviation issue likely to be raised by PV solar energy facilities (Spaven Consulting 2011).

As noted within this report, PV solar energy facilities positioned away from airports and airfields are unlikely to present problems to pilots, with the only potential hazards likely to be encountered during the critical phases of flight, namely approach and landing (Spaven Consulting 2011). The report also concluded that there was no evidence at the time of publication of glare from any existing PV solar energy facilities affecting pilots and no cases of accidents in which glare caused by a PV solar energy facility was cited as a factor (Spaven Consulting 2011).

As noted in Section 3.7, Armidale Airport is approximately 5.4 km north of the development footprint for the northern array area. Armidale Airport's primary runway is positioned in an approximate south-west to north-east orientation. Due to the distance between the Armidale Airport and the development footprint, it is unlikely that aircraft using this facility will pass directly over the three array areas during the critical phases of flight as identified in the report produced by Spaven Consulting (2011). EMM consulted with the Civil Aviation Safety Authority (CASA) during the preparation of this VIA to discuss the potential impact of the project on flights to and from Armidale Airport. As part of this consultation, CASA acknowledged that they had reviewed the PEA for the project and advised that the project is distant from any aerodromes or known landing areas and, as such, CASA did not consider any potential glare to be a hazard to air navigation. CASA also noted that they did not require a glare analysis for the project.

A scoping exercise was conducted by Solar Trade Association (2016) to help inform debates around development proposals for non-domestic PV solar developments in Scotland. The exercise identified a variety of examples of airports successfully operating with large installations of PV modules on airport-related infrastructure, adjacent to airport runways and/or under direct flight paths (Solar Trade Association 2016). REC PV modules are currently in use at the Giebelstadt Power Plant in Germany, which features 120,000 PV modules with a total capacity of 28 MW. This project is adjacent to an airport currently used for general aviation purposes. Within the United States, four separate arrays of PV modules envelop the Denver International Airport, with a combined capacity of approximately 10 MW. In Japan, Osaka's Kansai International Airport has had an 11.6 MW solar farm installed adjacent to the runway since 2014.

Within Australia, Adelaide Airport's Terminal One roof supports 760 PV modules with a capacity of 114 kW and Darwin Airport features a 4 MW solar farm, which includes 15,000 PV modules over 6 ha. In addition, the Ballarat Solar Park, which has an installed capacity of 300 kW, is positioned adjacent to the boundary of the Ballarat Airport.

The potential for low angled reflected sunlight to cause a distraction to drivers travelling along the local and regional road network was considered as part of the traffic impact assessment for the project (Appendix K of the EIS). Due to the low level of reflectivity of PV modules, as well as the possibility of other features becoming more common in modern PV module designs, such as anti-reflective coatings, the PV modules are not expected to cause a distraction to motorists travelling along the local and regional road network.

During consultation with the landowners at S6, S7 and S9, as well as the wider local community, concerns were raised about the potential impacts of glare from the PV modules. Where undulation in the landscape (refer contours presented in Figure 5.2, Figure 5.3 and Figure 5.4), favourable topography, screening in the form of existing remnant vegetation (including wind breaks) and/or landscaping completely removes or disrupts views towards the PV modules within the three array areas, potential impacts from glint or glare will be limited.

Significant refinements to the development footprint for the southern array area (ie exclusion of the area north of Salisbury Waters) has significantly reduced any potential visibility of PV modules from S6 and S7 (refer Figure 5.4). Further, the intention of the proposed landscaping at S9 (refer to Section 4.5.1) is to reduce the visibility of PV modules and other project infrastructure at this location, which will also mitigate any potential for glint or glare impacts.

Based on the findings of previous assessments prepared for PV solar energy facilities, glint and glare from the project's PV modules and other project infrastructure are not expected to significantly impact the following:

- receptors within the vicinity of the development footprint for the three array areas;
- people engaged in agricultural activities in the surrounding landscape;
- visitors to items of local heritage significance within proximity of the southern array area;
- motorists travelling along the local road network (including, but not restricted to, Gostwyck Road; Salisbury Plains Road; The Gap Road; Carlon Menzies Road; Munsies Road; Saumarez War Service Road; Hillview Road; Elliots Road and Big Ridge Road);
- motorists travelling along the regional road network (including Thunderbolts Way and the New England Highway);
- motorists travelling along a number of minor, unsealed rural property access roads and farm tracks; and
- aircraft arriving at or departing from Armidale Airport.

5.5 Community perceptions of large-scale solar developments

Both Ipsos (2015) and NSW Office of Environment and Heritage (OEH) (2015) have conducted separate investigations in to the acceptability of large-scale solar facilities in Australia and NSW, respectively. Ipsos (2015) noted that, in contrast to wind farms, large scale PV solar facilities do not trigger strong reactions from neighbouring members of the community. In a survey of approximately 1,200 Australians, a slightly higher proportion of participants agreed that large scale solar facilities have a negative visual impact on the local landscape when compared with participants who disagreed (Ipsos 2015). However, a higher proportion neither agreed nor disagreed, which indicates a lack of knowledge about the potential visual impact of such facilities.

As part of an investigation into community attitudes to renewable energy, OEH surveyed 2,000 adults from across NSW, with the majority of survey participants supporting the use of solar farms (OEH 2015). Of the small proportion of participants who opposed solar farms being located near their place of residence, visual impacts were one of the key concerns raised. This finding provides further evidence of the need for effective community consultation to ensure that surrounding landholders are adequately informed of the impact of the project on the surrounding landscape.

Community consultation as part of the project (refer Chapter 4 of the EIS) has focused on informing surrounding landholders of the development footprint and the likely visual impact of the project infrastructure on the local landscape. Concerns raised by the local community in relation to potential visual amenity impacts from the project's infrastructure were a significant consideration during the project refinement process and informed UPC's decision to reduce the extent of the development footprint for both the northern and southern array areas (refer Section 4.1 and Figure 4.1).

The results of this VIA indicate that the project will not have a significant visual impact on the majority of the surrounding receptors and viewpoints considered as part of this VIA. Landscaping is proposed to reduce the visibility of project infrastructure from S9 (refer to Section 4.5.1).

5.6 Cumulative impacts

Due to the distance between the development footprint for the northern array area and the approved site for the Metz Solar Farm (Figure 1.1), an assessment of potential cumulative visual impacts from the Metz Solar Farm and the project is not warranted. Similarly, an assessment of potential cumulative visual impacts from the Tilbuster Solar Farm and the project is not warranted due to distance between the two projects (should they both be constructed).

As noted in Section 3.9, Neoen is seeking to develop the Uralla Solar Farm within the Uralla Shire LGA, approximately 4.9 km north-west of the development footprint for the northern array area at its closest point. SEARs for the Uralla Solar Farm were not available at the time of writing; however, based on the information provided within the PEA, it is understood that if constructed, the proposed Uralla Solar Farm would cover an area of up to 1,800 ha and have a targeted capacity of around 400 MWac (GHD 2018).

The construction of the project and the Uralla Solar Farm would expand the overall area within the Uralla Shire LGA that is occupied by solar infrastructure. Assuming that the proposed site for the Uralla Solar Farm is utilised in its entirety, the combined area of the two projects would represent approximately 1.43% of the total land area within the Uralla Shire LGA. Once constructed, the solar arrays will be the prominent visual feature of both developments throughout their respective operational stages.

A cumulative visual impact may result from the project being constructed in conjunction with the Uralla Solar Farm; however, it is anticipated that views of project infrastructure from both projects will be limited as a result of:

- the distance between the two projects (approximately 4.9 km at their closest points);
- variable elevation and undulation within the landscape between the two projects;
- the presence of significant transport infrastructure within the landscape between the two projects, including the New England Highway and the Main Northern Railway; and
- the presence of remnant vegetation and planted wind breaks and vegetation screens within the landscape between the two projects.

5.6.1 Cumulative impacts during construction

During construction, the landscape within the development footprint for both projects will undergo a number of physical changes, namely through the installation of project infrastructure, which will add new features to the visual landscape.

Views of the two projects during construction may be possible for motorists travelling along the New England Highway; however, based on separation distances, it is anticipated that these views will be of only one project at any given time.

Views of project infrastructure within the development footprint for the northern array area from the New England Highway have been considered as part of this VIA (refer Section 5.3.14 and Figure A14). At its closest point, the development footprint for the northern array area is approximately 1.9 km from the New England Highway. The distance to the development footprint will limit the scale of change and degree of contrast for views from this location. Further, it is assumed the focus of these motorists will be in line with their direction of travel along this major road corridor.

The closest point of the proposed site for the Uralla Solar Farm to the New England Highway is approximately 1.6 km. The scale of change and degree of contrast for views towards the proposed site for the Uralla Solar Farm has not been assessed as part of this VIA.

Views of the development footprint for both projects during construction may be possible from a limited number of receptors (ie rural residential dwellings). This may include dwellings within proximity of Viewpoint 14 on the New England Highway and dwellings within proximity of Viewpoint 15 on Saumarez War Service Road, Tuberosa Road, Wattle Drive and Arding Road (refer Figure 5.5).

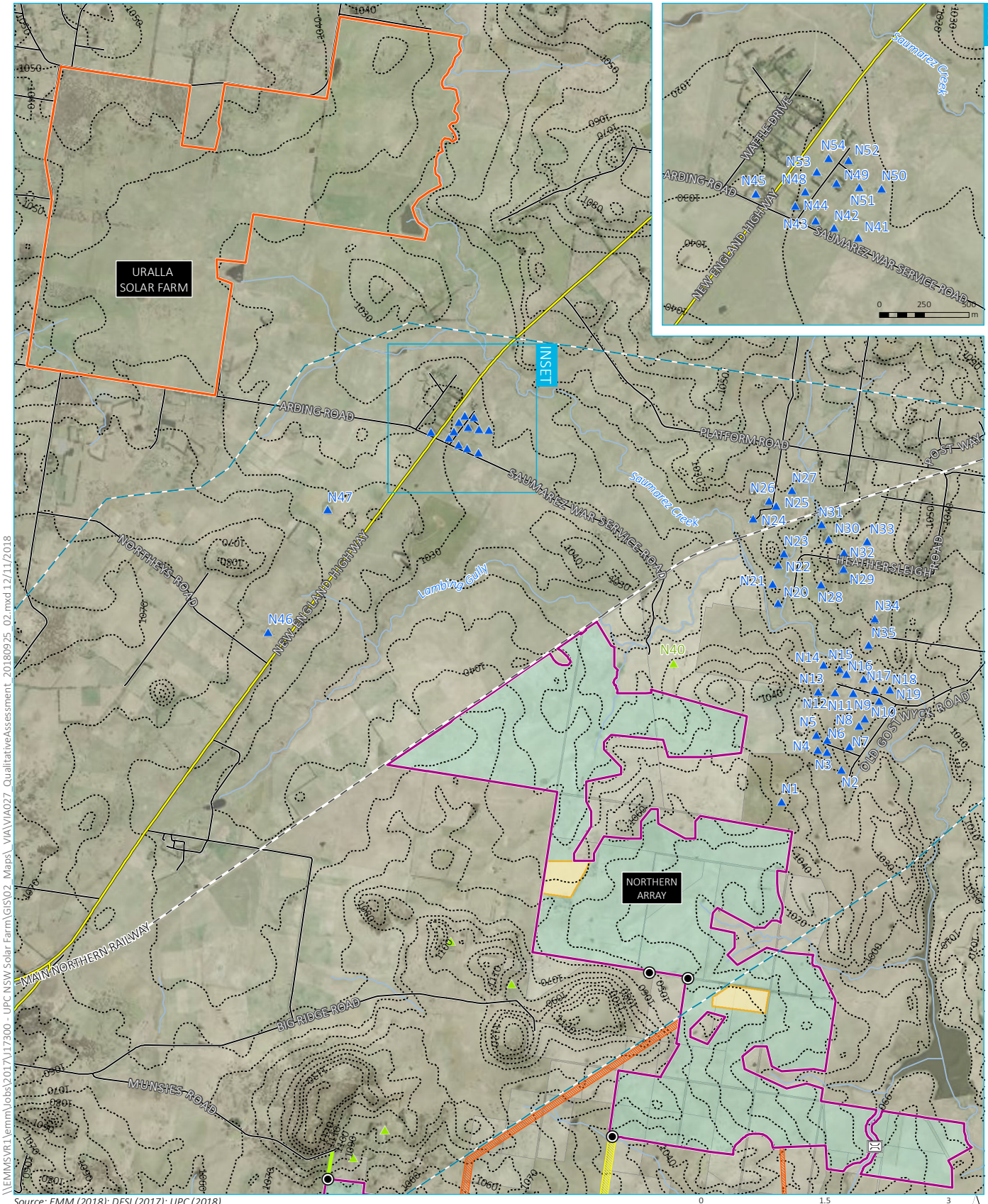
A review of aerial imagery indicates that there is vegetation present around each of these dwellings, which would act to further screen views of both projects during construction.

Due to their temporary nature, the site establishment works and construction activities for the project are considered unlikely to have any significant visual impacts on dwellings within proximity of Viewpoint 14 and Viewpoint 15.

5.6.2 Cumulative impacts during operation

Project infrastructure from both projects may be visible to motorists travelling along the New England Highway; however, based on separation distances, it is anticipated that these views will be of only one project at any given time. Further, due to the low level of reflectivity of PV modules, the project is not expected to cause a distraction to motorists travelling along the New England Highway.

A limited number of receptors (ie rural residential dwellings) may experience combined distant views of the project infrastructure from both projects. However, spatial separation between the development footprint for the northern array area and the proposed site for the Uralla Solar Farm, variable elevation and undulation within the landscape between the two projects, the presence of significant transport infrastructure within the landscape between the two projects and vegetation present around these receptors, will limit potential for cumulative visual impacts to occur.



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Source: EMM (2018); DFSI (2017); UPC (2018)

KEY

- 330 kV transmission line
- Rail line
- Main road
- Local road
- Watercourse/drainage line
- Contour (10 m)
- Uralla solar farm

Sensitive receptors

- Project-related
- Non-project related
- Project boundary
- Proposed primary site access point

Development footprint

- Solar array
- Potential ETL easement
- Potential site access corridor
- Potential site access/ETL easement
- Potential substation/BESS footprint
- Potential creek crossing

Qualitative assessment of potential cumulative impacts

New England Solar Farm
Visual impact assessment
Figure 5.5

EMM
creating opportunities

5.7 Summary of visual assessment

A summary of the results of the analysis of visual impacts for each of the 19 viewpoints is provided in Table 5.21. In addition, Table 5.22 provides a summary of the predicted visual impact from the 39 non-project related residences identified within 2 km of the development footprint for the three array areas. Due to the low level of reflectivity of the PV modules, they are not expected to cause a distraction to motorists travelling along the local and regional road network. Further, glint and glare are not expected to significantly impact the closest receptors.

Visual impacts from three items of local heritage significance listed on the Uralla LEP have also been considered as part of this VIA. It is anticipated that existing remnant vegetation, planted vegetation and wind breaks will mitigate the visibility of project infrastructure from these locations.

As part of the management and mitigation measures to address the project's impacts on the cultural landscape (refer Appendix E of the EIS), detailed digital photographic archival recording is proposed to capture the setting, views and vistas that may be lost temporarily during the project's operations. Photographs will be taken from ground level and using drone photography to capture discrete areas in greater detail than current aerial imagery allows.

Table 5.21 Summary of results of visual impacts at each viewpoint

Viewpoint	Distance to closest array area	Closest array area	Representative receptors	Residential or public	Project infrastructure visible based on viewshed analysis	Magnitude of change	Visual sensitivity	Evaluation of significance	Significant impact	Additional mitigation proposed	Potential for cumulative impacts with Uralla Solar Farm
Viewpoint 1	40 m*	Southern	S11**	Residential	Yes	High	Moderate	Moderate/ substantial	Yes	No***	No
Viewpoint 2	240 m*	Southern	S9	Residential	Yes	Moderate	Moderate	Moderate	No	Yes	No
Viewpoint 3	2.9 km*	Southern	S3; S1; S2	Residential	Yes	Low	Moderate	Slight/ moderate	No	No	No
Viewpoint 4	1,070 m*	Southern	S14	Residential	Yes	Low	Moderate	Slight/ moderate	No	No	No
Viewpoint 5	350 m*	Northern	N1	Residential	Yes	Moderate	Moderate	Moderate	No	No****	No
Viewpoint 6	380 m	Northern	N40**	Residential	Yes	Moderate	Moderate	Moderate	No	No**	No
Viewpoint 7	1.1 km	Southern	Uralla LEP listing I10 S8	Public	Yes	Low	High	Moderate	No	No	No
Viewpoint 8	970 m	Southern	Uralla LEP listing I11 Motorists	Public	Yes	Low	High	Moderate	No	No	No
Viewpoint 9	1.3 km	Southern	Motorists	Public	Yes	Low	Low	Slight	No	No	No
Viewpoint 10	2.3 km*	Central	C6 Motorists	Public	Yes	Low	Moderate	Slight/ moderate	No	No	No
Viewpoint 11	1.7 km*	Central	C5 Motorists	Public	Yes	Low	Moderate	Slight/ moderate	No	No	No
Viewpoint 12	1.9 km	Southern	Motorists	Public	Yes	Low	Low	Slight	No	No	No

Table 5.21 Summary of results of visual impacts at each viewpoint

Viewpoint	Distance to closest array area	Closest array area	Representative receptors	Residential or public	Project infrastructure visible based on viewshed analysis	Magnitude of change	Visual sensitivity	Evaluation of significance	Significant impact	Additional mitigation proposed	Potential for cumulative impacts with Uralla Solar Farm
Viewpoint 13	25 m (Thunderbolts Way)	Southern	Motorists	Public	Yes	Moderate	Low	Slight/ moderate	No	No	No
	900 m (Salisbury Court – S16)	Southern	Uralla LEP listing I14 S19; S20; S22	Residential	N/A*****	Low	High	Moderate	No	No	No
	600 m (S17)	Southern	S17	Residential	N/A*****	Low	Moderate	Slight/ moderate	No	No	No
Viewpoint 14	2.4 km	Northern	Motorists	Public	Yes	Low	Low	Slight	No	No	Yes
Viewpoint 15	2.4 km	Northern	N41; N42; N43; N44 Motorists	Public	Yes	Low	Moderate	Slight/ moderate	No	No	Yes
Viewpoint 16	2.5 km	Northern	N24; N25; N26; N27	Public	Yes	Low	Moderate	Slight/ moderate	No	No	No

Table 5.21 Summary of results of visual impacts at each viewpoint

Viewpoint	Distance to closest array area	Closest array area	Representative receptors	Residential or public	Project infrastructure visible based on viewshed analysis	Magnitude of change	Visual sensitivity	Evaluation of significance	Significant impact	Additional mitigation proposed	Potential for cumulative impacts with Uralla Solar Farm
Viewpoint 17	2.1 km	Northern	N20; N21; N22; N23; N28; N29; N30; N31; N32; N33	Public	Yes	Low	Moderate	Slight/ moderate	No	No	No
Viewpoint 18	1.1 km	Northern	N10; N11; N12; N13; N14; N15; N16; N17; N18; N19	Public	No	Negligible	Moderate	Slight	No	No	No
Viewpoint 19	1 km	Northern	N2; N3; N4; N5; N6; N7	Public	No	Negligible	Moderate	Slight		No	No

Notes: **Distance from closest representative receptor (ie dwelling).*

***Rural dwellings owned by one of the project landholders that are currently leased to a member of the local community.*

****Mitigation measures will be subject to discussions between UPC, the project landholder and the tenant.*

*****Discussions between UPC and N1 are ongoing and include consideration of options for landscaping to address the potential visibility of project infrastructure from the southern aspect of the dwelling at Viewpoint 5, should it be required.*

******A viewshed analysis has not been performed from Salisbury Court homestead or S17.*

Table 5.22 Predicted visual impact from non-project related residences within 2 km of the development footprint for the three array areas

Receptor ID number*	Approximate distance to closest array area (m)	Closest representative viewpoint	Evaluation of significance from Table 5.21	Predicted visual impact from residence (high, moderate, low or negligible)**
S11***	40	Viewpoint 1	Moderate/substantial	High
S9	240	Viewpoint 2	Moderate	Moderate
N1	350	Viewpoint 5	Moderate	Moderate
N40***	380	Viewpoint 6	Moderate	Moderate
S17	620	Viewpoint 13	Slight/moderate	Low
S8	720	Viewpoint 7	Moderate	Negligible
N5	870	Viewpoint 19	Slight	Negligible
N4	910	Viewpoint 19	Slight	Negligible
N13	920	Viewpoint 18	Slight	Negligible
S16	920	Viewpoint 13	Moderate	Negligible
N2	970	Viewpoint 19	Slight	Negligible
S15	990	None	Not applicable	Low - extensive vegetation around residence anticipated to screen views of project infrastructure.
N6	1010	Viewpoint 19	Slight	Negligible
N3	1030	Viewpoint 19	Slight	Negligible
S14	1050	Viewpoint 4	Slight/moderate	Low
N12	1110	Viewpoint 18	Slight	Negligible
N14	1130	Viewpoint 18	Slight	Low
N7	1250	Viewpoint 19	Slight	Negligible
N15	1260	Viewpoint 18	Slight	Negligible
C6	1290	Viewpoint 10	Slight/moderate	Low
N16	1310	Viewpoint 18	Slight	Negligible
N11	1320	Viewpoint 18	Slight	Negligible
S22	1360	Viewpoint 13	Slight/moderate	Negligible
N8	1370	Viewpoint 19	Slight	Negligible

Table 5.22 Predicted visual impact from non-project related residences within 2 km of the development footprint for the three array areas

Receptor ID number*	Approximate distance to closest array area (m)	Closest representative viewpoint	Evaluation of significance from Table 5.21	Predicted visual impact from residence (high, moderate, low or negligible)**
N20	1430	Viewpoint 17	Slight/moderate	Negligible
N9	1430	Viewpoint 18	Slight	Negligible
N17	1490	Viewpoint 18	Slight	Negligible
N18	1590	Viewpoint 18	Slight	Negligible
N10	1620	Viewpoint 18	Slight	Negligible
N21	1630	Viewpoint 17	Slight/moderate	Negligible
S18	1660	None	Not applicable	Negligible - extensive vegetation around residence anticipated to screen views of project infrastructure.
C5	1690	Viewpoint 11	Slight/moderate	Low
N35	1710	None	Not applicable	Negligible - extensive vegetation around residence anticipated to screen views of project infrastructure.
N19	1760	Viewpoint 18	Slight	Negligible
S20	1770	Viewpoint 13	Slight/moderate	Low
S19	1790	Viewpoint 13	Slight/moderate	Low
N28	1830	Viewpoint 17	Slight/moderate	Negligible
N22	1880	Viewpoint 17	Slight/moderate	Negligible
S21	1890	None	Not applicable	Low - vegetation and agricultural infrastructure anticipated to screen views of project infrastructure.
N34	1950	None	Not applicable	Negligible - extensive vegetation around residence anticipated to screen views of project infrastructure.
C3	1970	None	Not applicable	Low - remnant vegetation anticipated to screen views of project infrastructure.

Notes: **Refer Figure 5.2 (northern array), Figure 5.3 (central array) and Figure 5.4 (southern array).*

***Based on magnitude of change – refer Section 2.2.4 and Table 2.3.*

****Rural dwellings owned by one of the project landholders that are currently leased to a member of the local community.*

6 Conclusion

A visual assessment has been conducted from a number of representative viewpoints surrounding the development footprint. The representative viewpoints were selected based on the following criteria:

- proximity to the three array areas;
- the location of receptors (ie dwellings);
- the positioning of regional and local roads and potential impacts on passing motorists;
- the location of items of local heritage significance listed within the Uralla LEP;
- local topography; and
- presence of remnant vegetation and wind breaks with potential to provide screening.

The representative viewpoints have been assessed to demonstrate the potential visual impacts of the project. Due to existing mature vegetation, variable elevation and undulation in the landscape, and the height of the dominant project infrastructure, namely the PV modules, infrastructure within the three array areas will be relatively shielded from view at a number of the viewpoints assessed as part of this assessment.

The project design, development footprint and placement of the three array areas have progressively evolved to minimise or avoid visual impacts, where possible. This has included significant revisions to the extent of the northern and southern array areas. Nonetheless, the development of the project will result in some changes to the landscape. Visual impacts will occur during the construction and operational stages of the project. The visual landscape will be altered from its current state for the duration of the operational stage of the project.

The visual assessment determined that, of the viewpoints assessed, infrastructure may be visible to varying degrees from 17 of the 19 viewpoints. Based on variable elevation and undulation in the landscape and the presence of vegetation, combined with the height of the PV modules, the impact assessment predicts:

- a slight visual impact for viewpoints 9, 12, 14, 18 and 19;
- a slight/moderate visual impact for viewpoints 3, 4, 10, 11, 13 (Thunderbolts Way and S17), 15, 16 and 17;
- a moderate visual impact for viewpoints 2, 5, 6, 7, 8 and 13 (Salisbury Court); and
- a potentially significant impact for Viewpoint 1 for the unmitigated scenario.

Landscape screening is proposed to mitigate visual impacts at the following:

- S11 - discussions between UPC, the relevant project landholder and the tenant at S11 will inform requirements for landscaping to mitigate views at Viewpoint 1;
- S9 – existing vegetation was observed along the boundary of this property; however, additional landscape screening is proposed to mitigate visual impacts at S9; and

- N1 - discussions between UPC and N1 are ongoing and include consideration of options for landscaping to address the potential visibility of project infrastructure from the southern aspect of the dwelling at Viewpoint 5, should it be required.

Visual impacts from three items of local heritage significance listed on the Uralla LEP have also been considered as part of this VIA. It is anticipated that distance between these items and the development footprint, existing remnant vegetation, planted vegetation and wind breaks will mitigate the visibility of project infrastructure in the southern array area from these locations.

As part of the management and mitigation measures to address the project's impacts on the cultural landscape (refer Appendix C of the EIS), detailed digital photographic archival recording is proposed to capture the setting, views and vistas that may be lost temporarily during the project's operations.

Motorists travelling along the New England Highway may experience transitory and distant views of project infrastructure within the development footprint for the northern array area. As it is assumed that the focus of these motorists will be in line with their direction of travel along this road corridor and motorists will be travelling at the prescribed speed limit of 100 km/hr, any potential views are considered insignificant.

Should it proceed, the construction of the project and the proposed Uralla Solar Farm being developed by Neoen will expand the overall area within the Uralla Shire LGA that is occupied by solar infrastructure. Based on the height of the dominant project infrastructure, namely the PV modules, variable elevation and undulation in the landscape, the presence of vegetation and separation distances between the northern array area and the Uralla Solar Farm, it is anticipated that there is limited potential for significant combined views of the project and the Uralla Solar Farm. In addition, two significant transport passages, ie the New England Highway and Main Northern Railway, separate the northern array area and the proposed site for Uralla Solar Farm, both of which will further restrict potential for combined views of the two projects (should they both be constructed).

This VIA concludes that the implementation of additional mitigation measures will ensure that the project will not have any significant adverse visual impacts on the locality.

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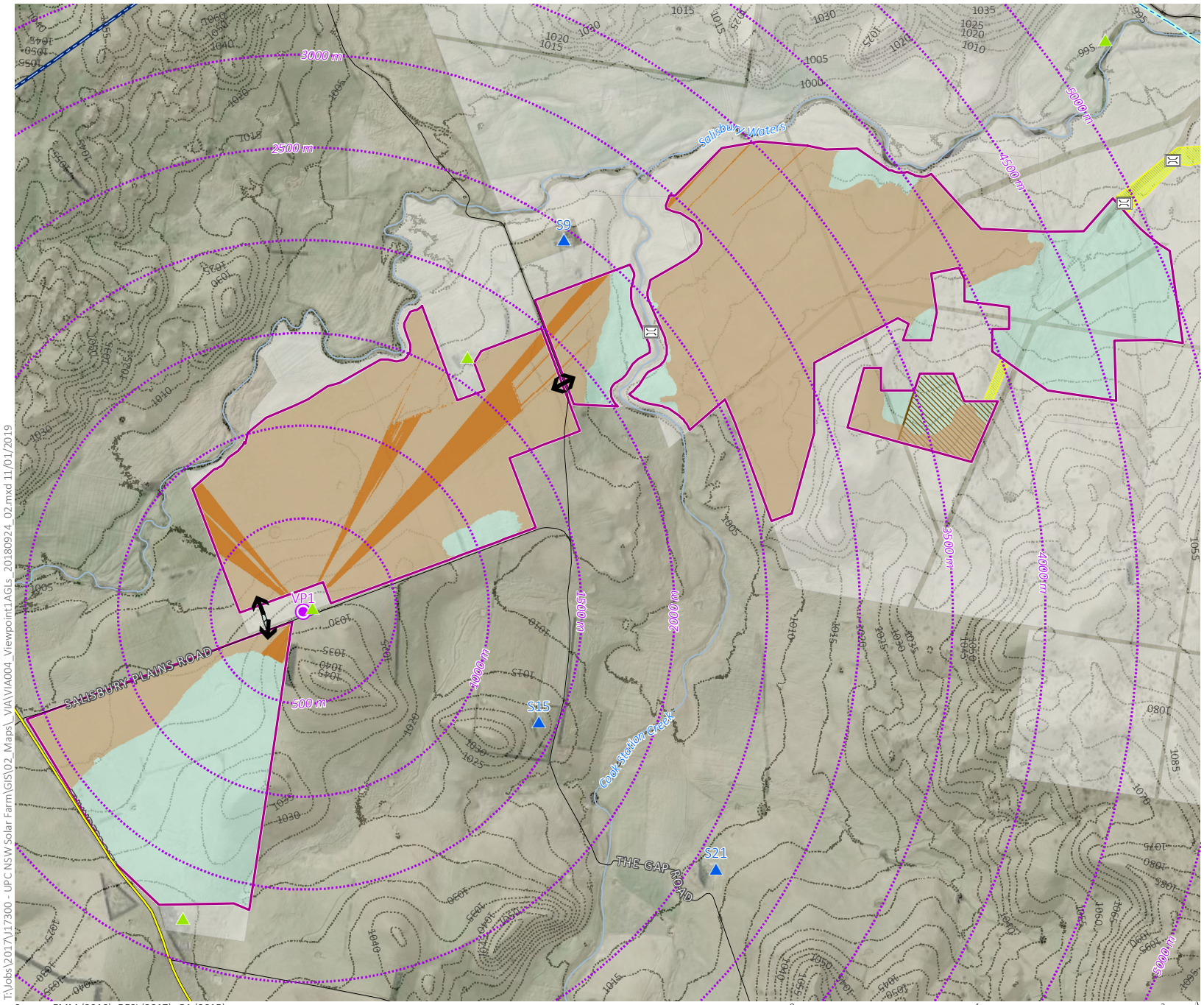
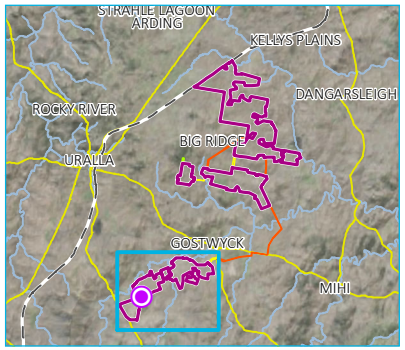
Appendix A

Viewshed analysis figures





KEY

- Existing 330 kV transmission line
- Existing 66 kV transmission line
- Main road
- Local road
- Named watercourse
- Contour (5 m)
- Project boundary

Development footprint

- Solar array
- Potential substation/BESS footprint
- Potential site access/ETL easement
- Potential electrical cabling/site access corridor
- Potential creek crossing
- Proposed primary site access point

Sensitive receptors

- Project-related
- Non-project related

Visual impact assessment

- Viewpoint location
- Viewpoint buffer (500 m increments)
- Visible project infrastructure (assumed 4.3 m height) - bare earth surface
- Visible project infrastructure (assumed 4.3 m height) - accounting for shielding features in the landscape (eg vegetation)

Viewshed analysis - Viewpoint 1

New England Solar Farm
Visual impact assessment
Figure A1

EMM
creating opportunities

Source: EMM (2018); DFSI (2017); GA (2015)

0 1 2 km

GDA 1994 MGA Zone 56

N

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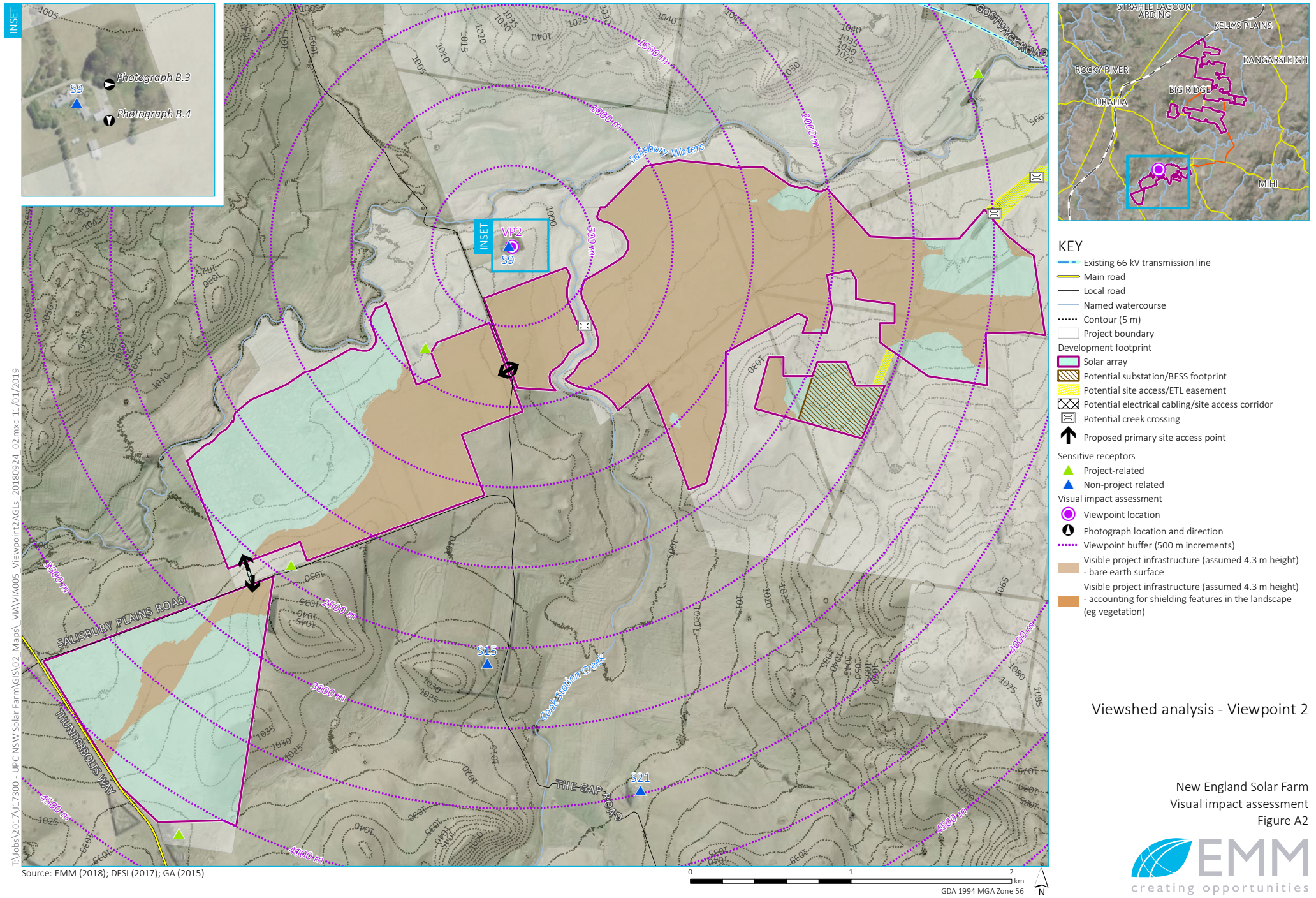

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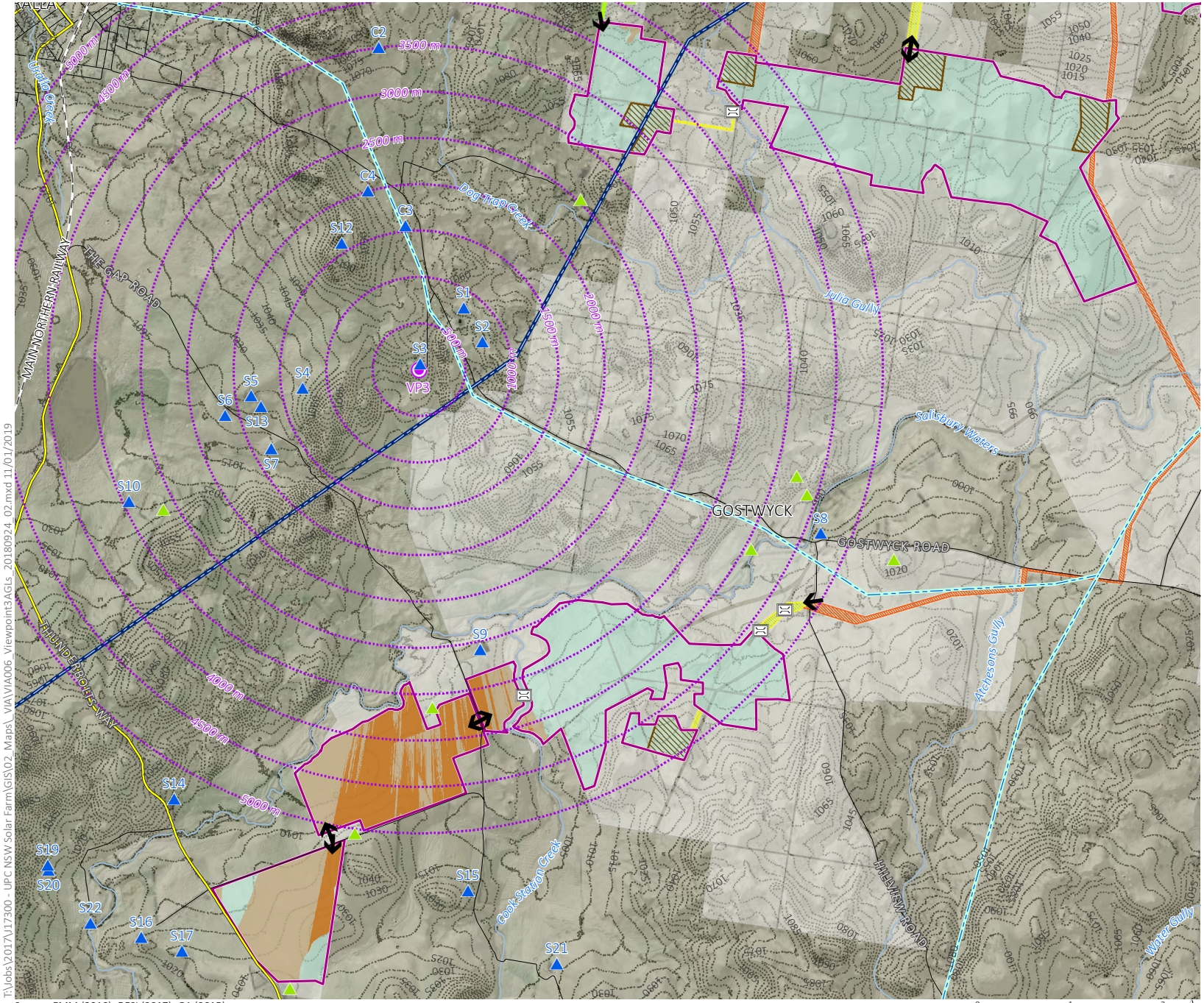
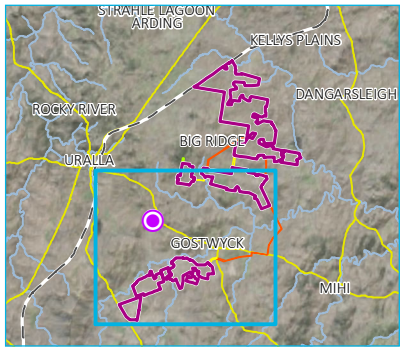
Source: EMM (2018); DFSI (2017); GA (2015)

Viewshed analysis - Viewpoint 2

New England Solar Farm
Visual impact assessment
Figure A2

EMM
creating opportunities





KEY

- Existing 330 kV transmission line
- Existing 66 kV transmission line
- Rail line
- Main road
- Local road
- Named watercourse
- Contour (5 m)
- Project boundary

Development footprint

- Solar array
- Potential substation/BESS footprint
- Potential ETL easement
- Potential site access corridor
- Potential site access/ETL easement
- Potential electrical cabling/site access corridor
- Potential creek crossing
- Proposed primary site access point

Sensitive receptors

- Project-related
- Non-project related

Visual impact assessment

- Viewpoint location
- Viewpoint buffer (500 m increments)
- Visible project infrastructure (assumed 4.3 m height) - bare earth surface
- Visible project infrastructure (assumed 4.3 m height) - accounting for shielding features in the landscape (eg vegetation)

Viewshed analysis - Viewpoint 3

Source: EMM (2018); DFSI (2017); GA (2015)

0 1 2 km

GDA 1994 MGA Zone 56

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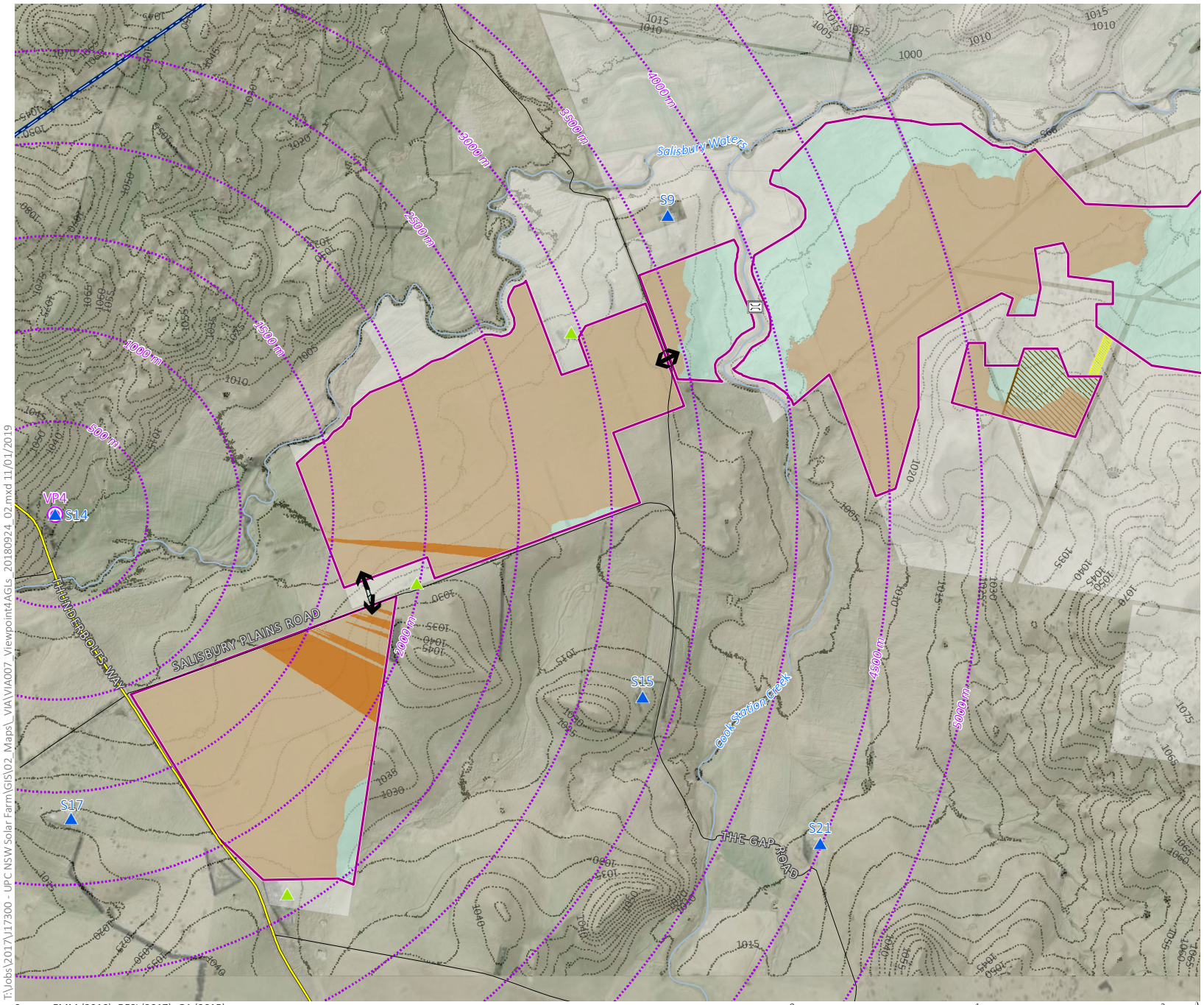
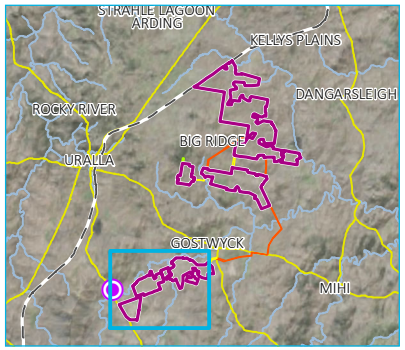
New England Solar Farm
Visual impact assessment
Figure A3

EMM
creating opportunities





KEY

- Existing 330 kV transmission line
- Main road
- Local road
- Named watercourse
- Contour (5 m)
- Project boundary

Development footprint

- Solar array
- Potential substation/BESS footprint
- Potential site access/ETL easement
- Potential electrical cabling/site access corridor
- Potential creek crossing
- Proposed primary site access point

Sensitive receptors

- Project-related
- Non-project related

Visual impact assessment

- Viewpoint location
- Viewpoint buffer (500 m increments)
- Visible project infrastructure (assumed 4.3 m height) - bare earth surface
- Visible project infrastructure (assumed 4.3 m height) - accounting for shielding features in the landscape (eg vegetation)

Source: EMM (2018); DFSI (2017); GA (2015)

0 1 2 km

GDA 1994 MGA Zone 56

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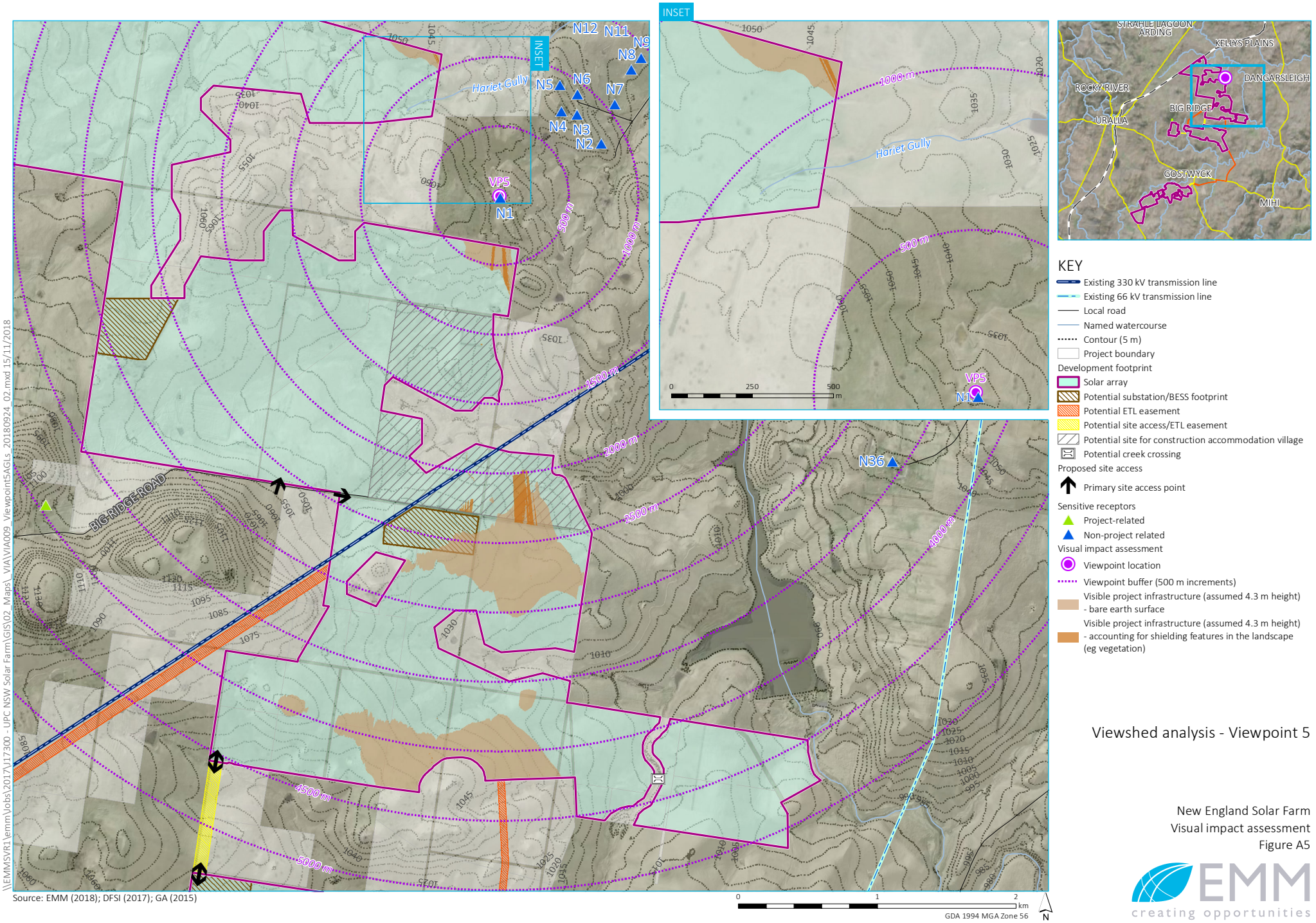
Viewshed analysis - Viewpoint 4

New England Solar Farm
Visual impact assessment
Figure A4

EMM
creating opportunities



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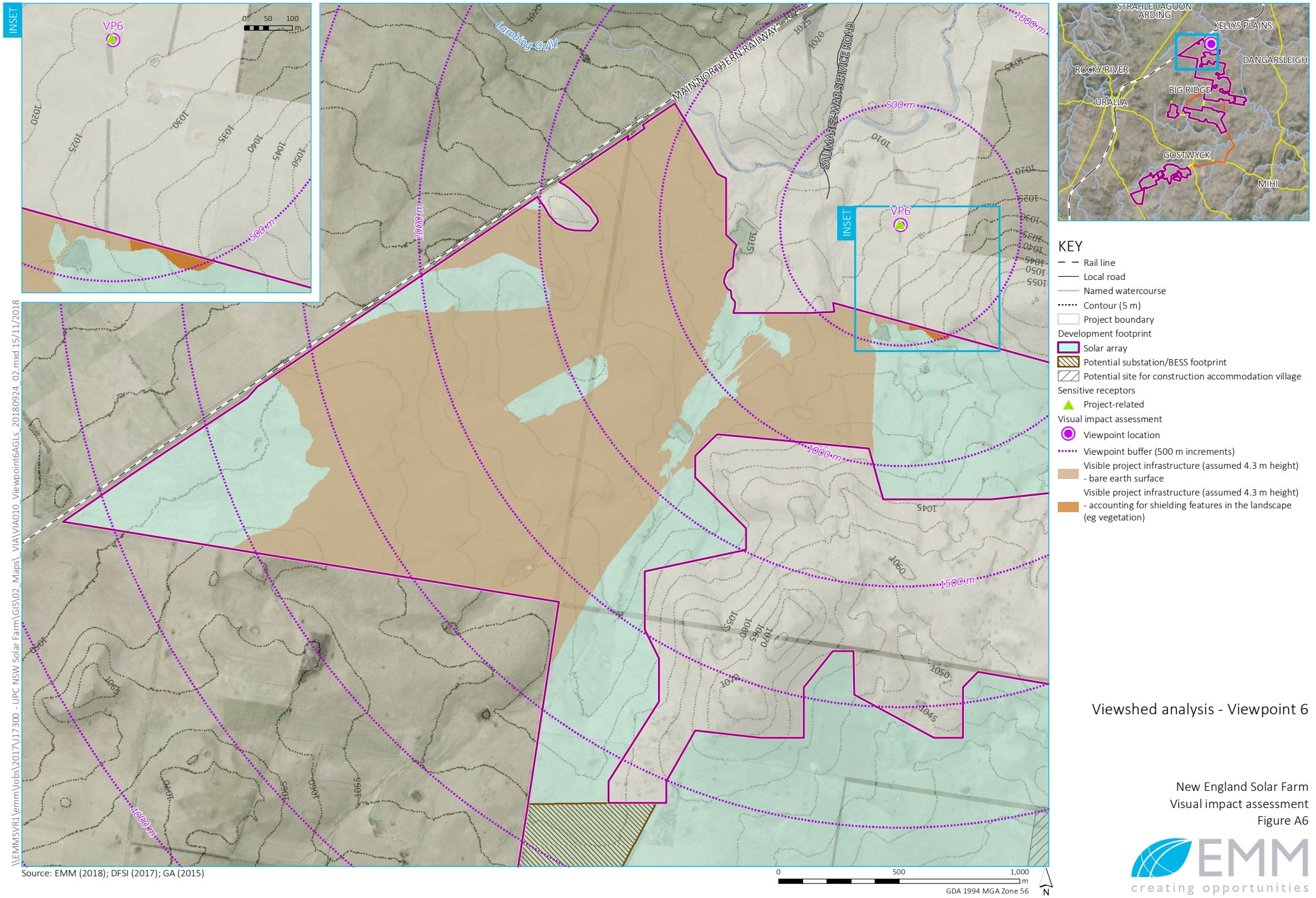
Source: EMM (2018); DFSI (2017); GA (2015)

Viewshed analysis - Viewpoint 5

New England Solar Farm
Visual impact assessment
Figure A5

EMM
creating opportunities



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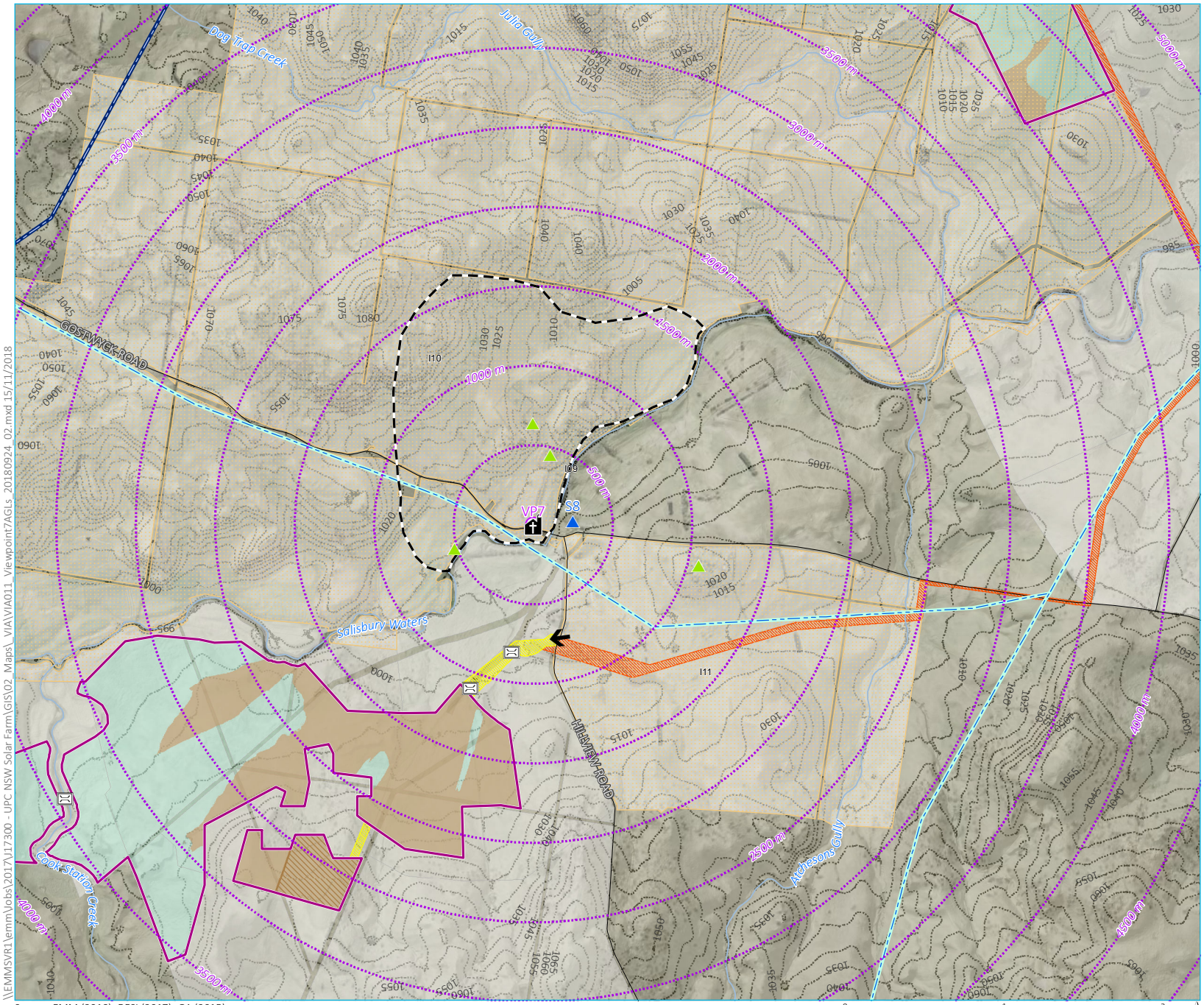
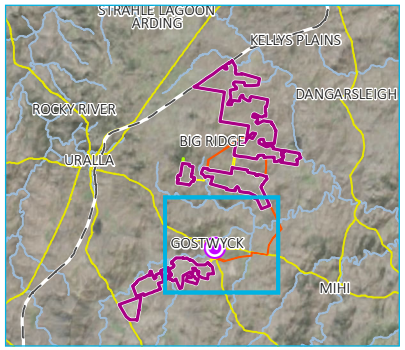
Source: EMM (2018); DFSI (2017); GA (2015)

Viewshed analysis - Viewpoint 6

New England Solar Farm
Visual impact assessment
Figure A6

EMM
creating opportunities





KEY

- Existing 330 kV transmission line
- Existing 66 kV transmission line
- Local road
- Named watercourse
- Contour (5 m)
- Chapel
- Gostwyck Memorial Chapel Precinct
- Item - General (Schedule 5 LEP (EP&A Act 1979))
- Project boundary

Development footprint

- Solar array
- Potential substation/BESS footprint
- Potential ETL easement
- Potential site access/ETL easement
- Potential creek crossing
- Proposed primary site access point

Sensitive receptors

- Project-related
- Non-project related

Visual impact assessment

- Viewpoint location
- Viewpoint buffer (500 m increments)
- Visible project infrastructure (assumed 4.3 m height) - bare earth surface
- Visible project infrastructure (assumed 4.3 m height) - accounting for shielding features in the landscape (eg vegetation)

Viewshed analysis - Viewpoint 7

New England Solar Farm
Visual impact assessment
Figure A7

Source: EMM (2018); DFSI (2017); GA (2015)

0 1 2 km

GDA 1994 MGA Zone 56

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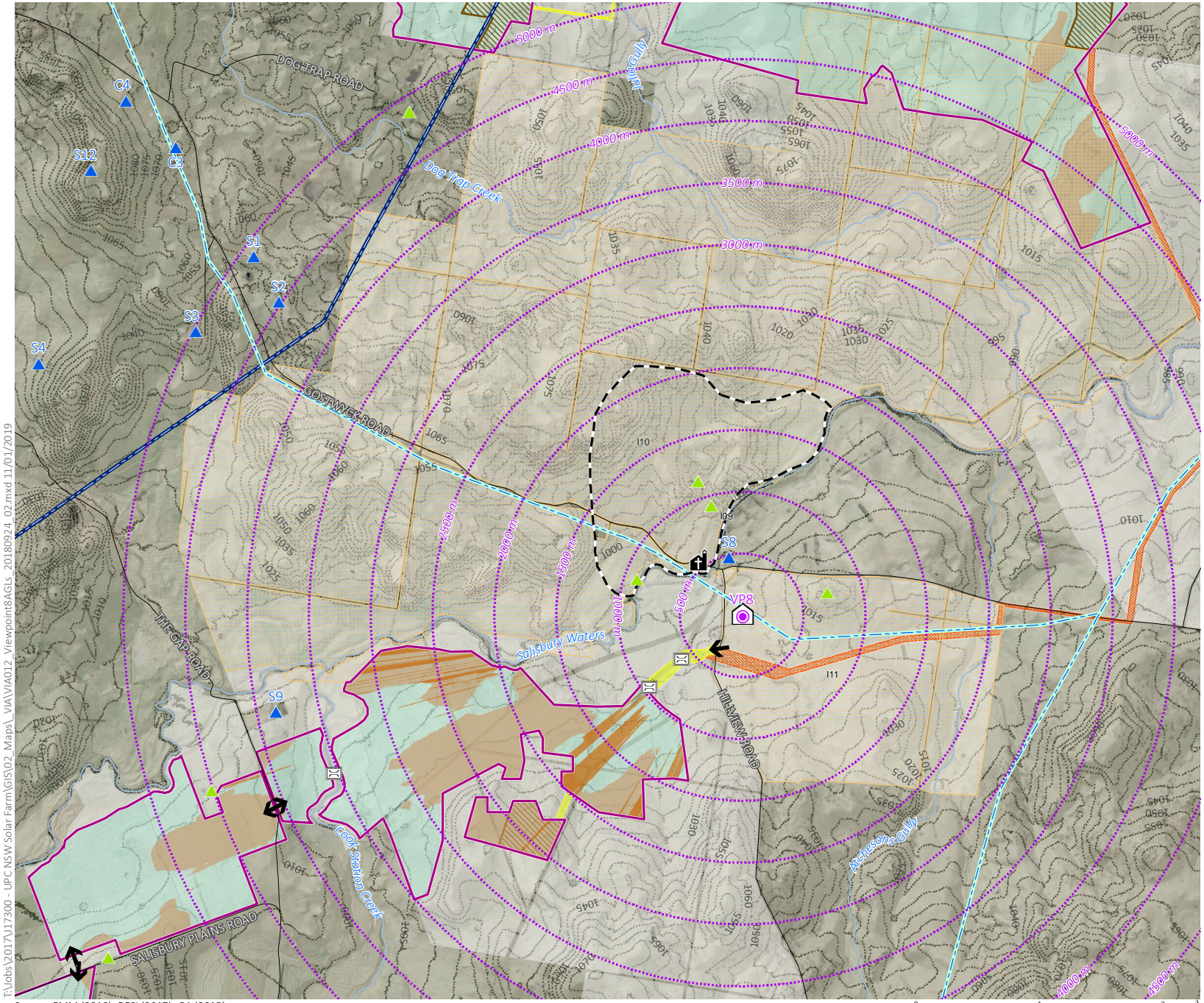
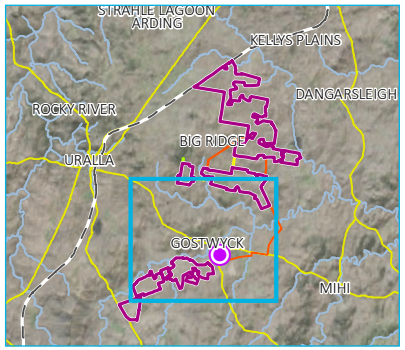
creating opportunities





KEY

- Existing 330 kV transmission line
- Existing 66 kV transmission line
- Local road
- Named watercourse
- Contour (5 m)
- Chapel
- Deeargee Woolshed
- Gostwyck Memorial Chapel Precinct
- Item - General (Schedule 5 LEP (EP&A Act 1979))
- Project boundary

Development footprint

- Solar array
- Potential substation/BESS footprint
- Potential ETL easement
- Potential site access corridor
- Potential site access/ETL easement
- Potential electrical cabling
- Potential creek crossing
- Proposed primary site access point

Sensitive receptors

- Project-related
- Non-project related

Visual impact assessment

- Viewpoint location
- Viewpoint buffer (500 m increments)
- Visible project infrastructure (assumed 4.3 m height) - bare earth surface
- Visible project infrastructure (assumed 4.3 m height) - accounting for shielding features in the landscape (eg vegetation)

Viewshed analysis - Viewpoint 8

Source: EMM (2018); DFSI (2017); GA (2015)

0 1 2 km

GDA 1994 MGA Zone 56

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New England Solar Farm
Visual impact assessment
Figure A8

EMM
creating opportunities

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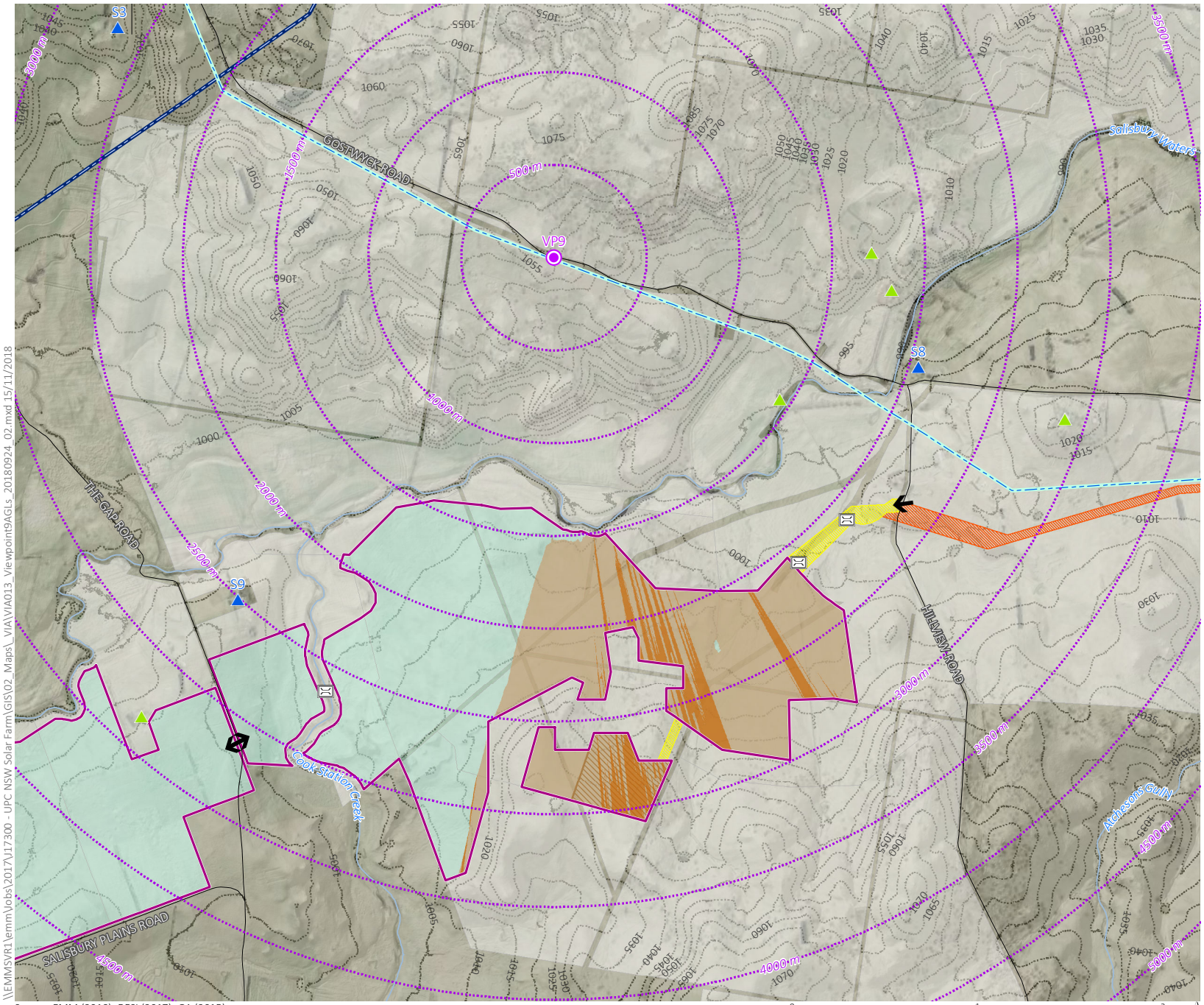

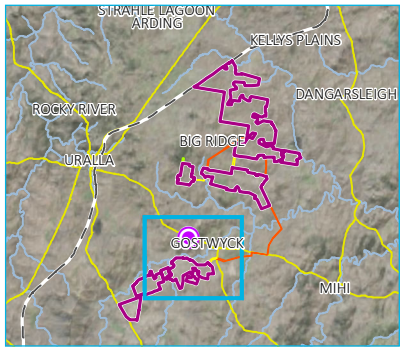

KEY

- Existing 330 kV transmission line
- Existing 66 kV transmission line
- Local road
- Named watercourse
- Contour (5 m)
- Project boundary

Development footprint

- Solar array
- Potential substation/BESS footprint
- Potential ETL easement
- Potential site access/ETL easement
- Potential creek crossing
- Primary site access point

Sensitive receptors

- Project-related
- Non-project related

Visual impact assessment

- Viewpoint location
- Viewpoint buffer (500 m increments)
- Visible project infrastructure (assumed 4.3 m height) - bare earth surface
- Visible project infrastructure (assumed 4.3 m height) - accounting for shielding features in the landscape (eg vegetation)

Source: EMM (2018); DFSI (2017); GA (2015)

0 1 2 km

GDA 1994 MGA Zone 56

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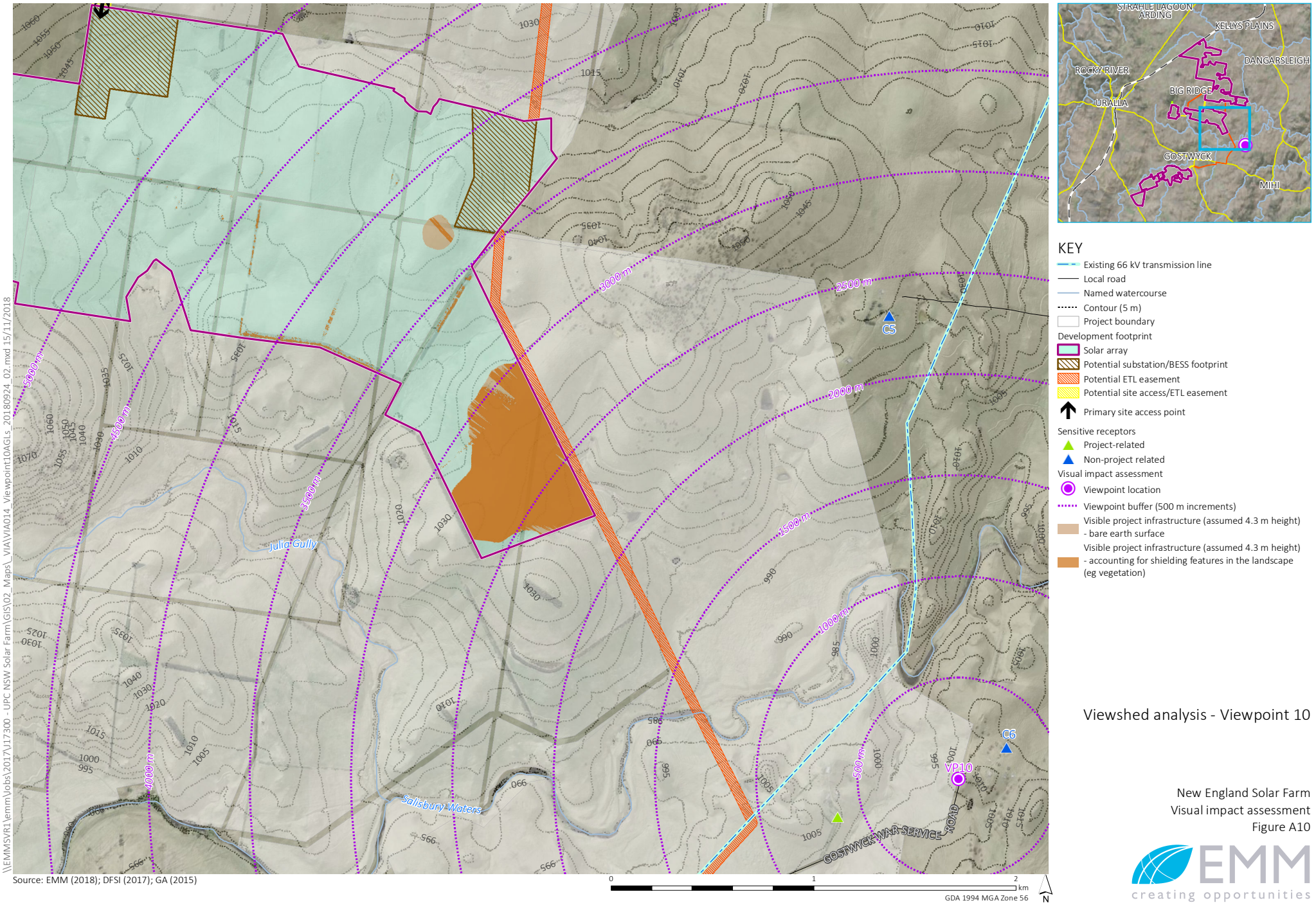
Viewshed analysis - Viewpoint 9

New England Solar Farm
Visual impact assessment
Figure A9

EMM
creating opportunities



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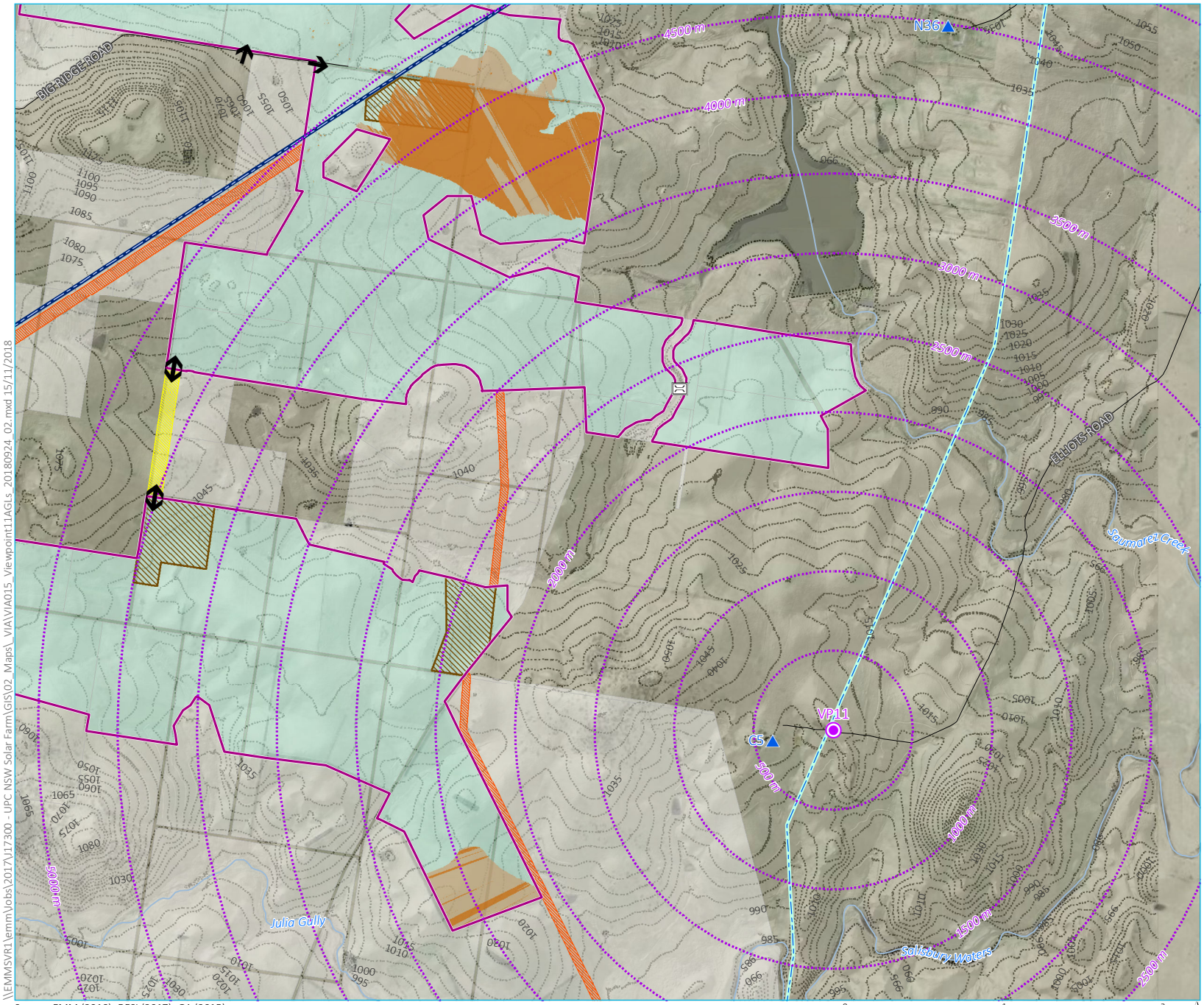
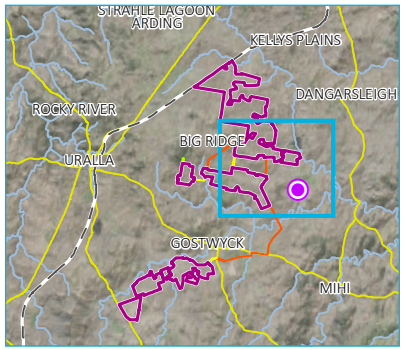
Source: EMM (2018); DFSI (2017); GA (2015)

Viewshed analysis - Viewpoint 10

New England Solar Farm
Visual impact assessment
Figure A10

EMM
creating opportunities





KEY

- Existing 330 kV transmission line
- Existing 66 kV transmission line
- Local road
- Named watercourse
- Contour (5 m)
- Project boundary

Development footprint

- Solar array
- Potential substation/BESS footprint
- Potential ETL easement
- Potential site access/ETL easement
- Potential creek crossing
- Proposed primary site access point

Sensitive receptors

- Non-project related

Visual impact assessment

- Viewpoint location
- Viewpoint buffer (500 m increments)
- Visible project infrastructure (assumed 4.3 m height) - bare earth surface
- Visible project infrastructure (assumed 4.3 m height) - accounting for shielding features in the landscape (eg vegetation)

Viewshed analysis - Viewpoint 11

New England Solar Farm
Visual impact assessment
Figure A11

EMM creating opportunities

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Source: EMM (2018); DFSI (2017); GA (2015)

0 1 2 km

GDA 1994 MGA Zone 56

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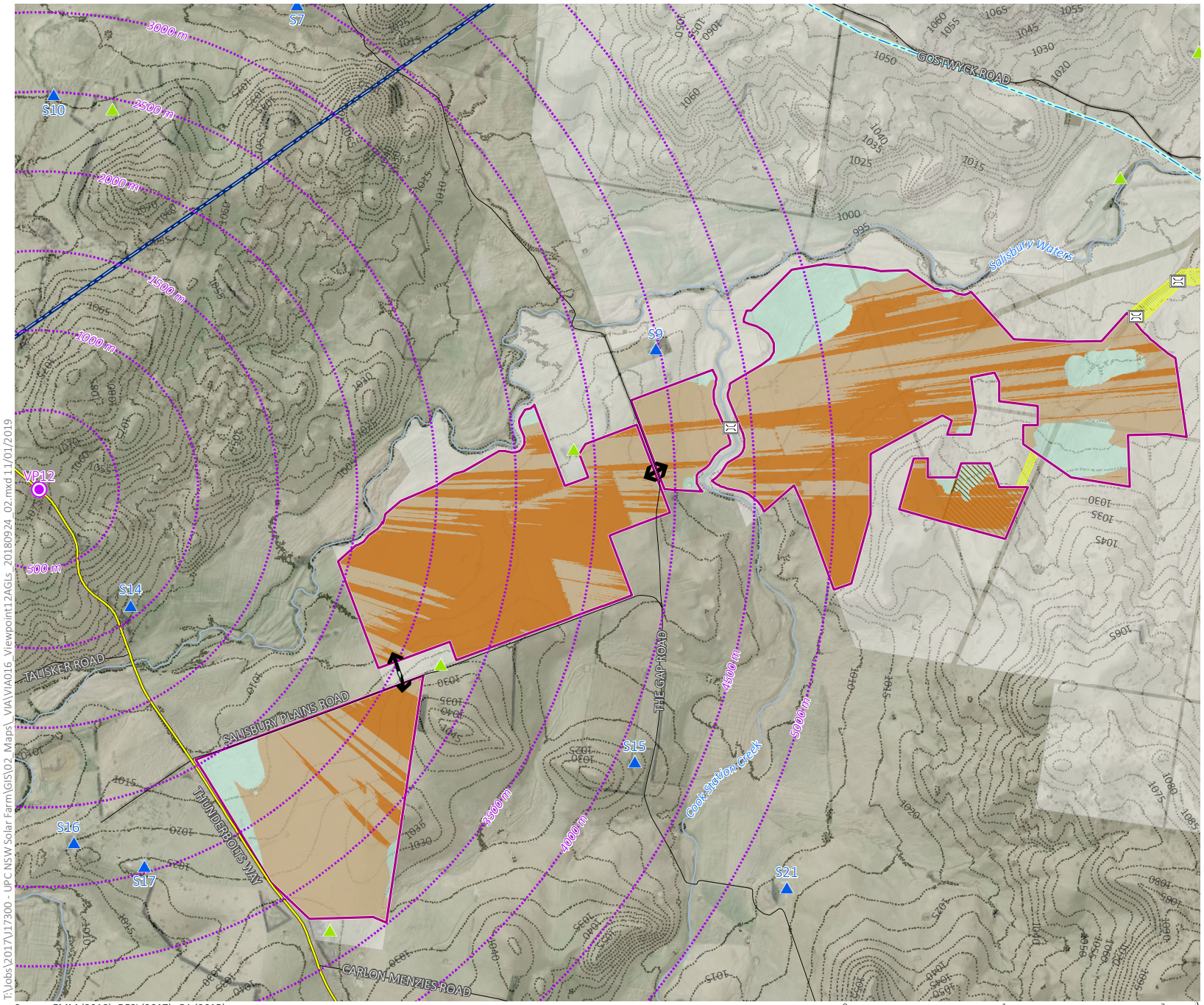

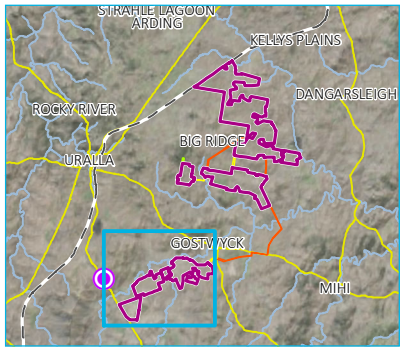

KEY

- Existing 330 kV transmission line
- Existing 66 kV transmission line
- Main road
- Local road
- Named watercourse
- Contour (5 m)
- Project boundary

Development footprint

- Solar array
- Potential substation/BESS footprint
- Potential site access/ETL easement
- Potential electrical cabling/site access corridor
- Potential creek crossing
- Proposed primary site access point

Sensitive receptors

- Project-related
- Non-project related

Visual impact assessment

- Viewpoint location
- Viewpoint buffer (500 m increments)
- Visible project infrastructure (assumed 4.3 m height) - bare earth surface
- Visible project infrastructure (assumed 4.3 m height) - accounting for shielding features in the landscape (eg vegetation)

Viewshed analysis - Viewpoint 12

New England Solar Farm
Visual impact assessment
Figure A12

EMM
creating opportunities

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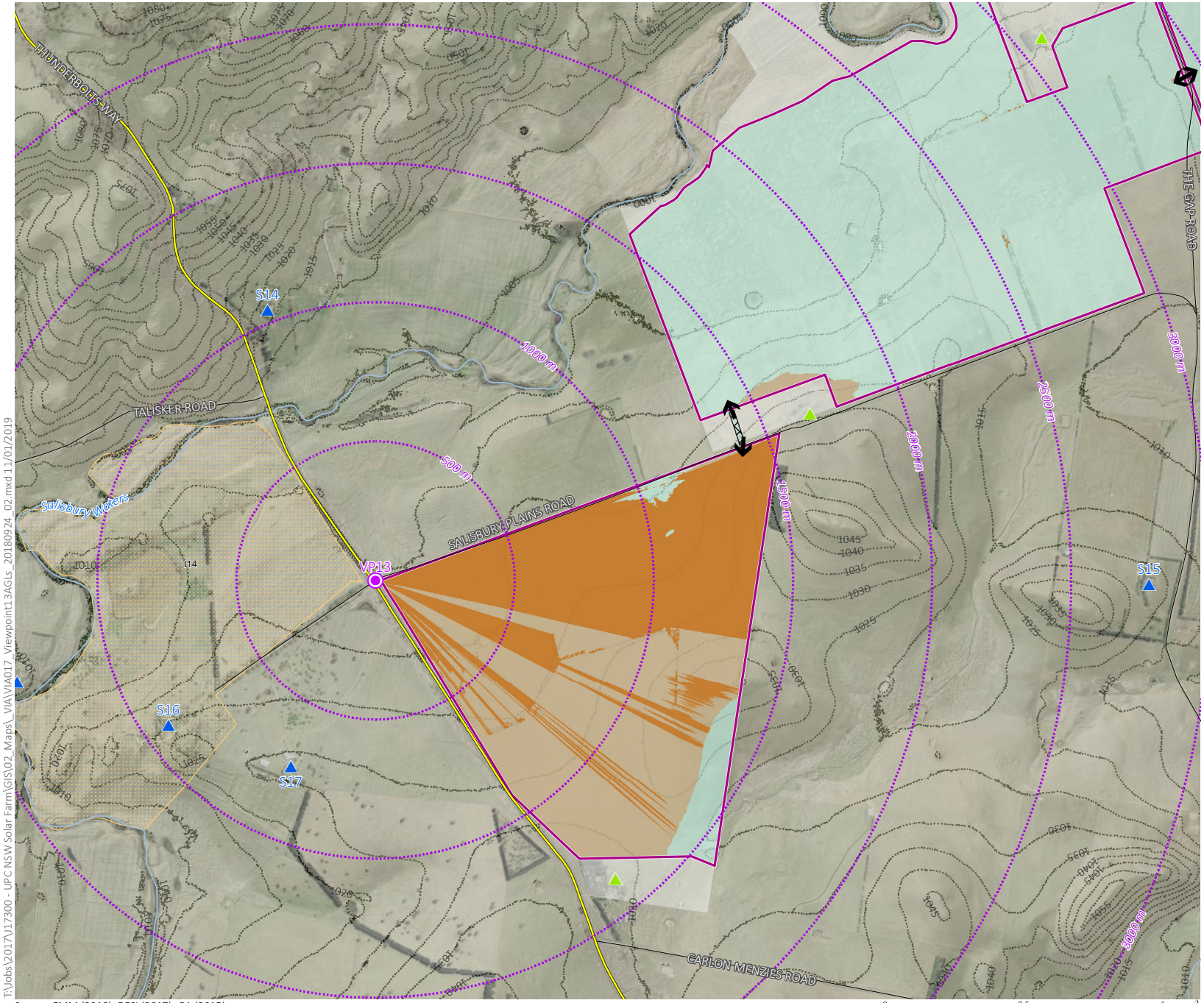
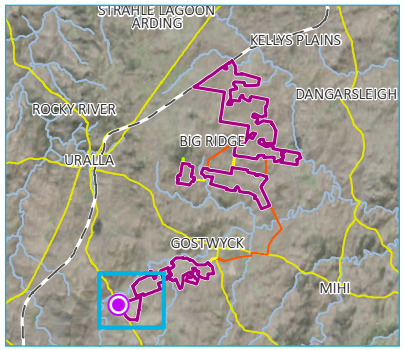
Source: EMM (2018); DFSI (2017); GA (2015)

0 1 2 km

GDA 1994 MGA Zone 56

N





KEY

- Main road
- Local road
- Named watercourse
- Contour (5 m)
- Item - General (Schedule 5 LEP (EP&A Act 1979))
- Project boundary

Development footprint

- Solar array
- Potential electrical cabling/site access corridor
- Proposed primary site access point

Sensitive receptors

- Project-related
- Non-project related

Visual impact assessment

- Viewpoint location
- Viewpoint buffer (500 m increments)
- Visible project infrastructure (assumed 4.3 m height) - bare earth surface
- Visible project infrastructure (assumed 4.3 m height) - accounting for shielding features in the landscape (eg vegetation)

Source: EMM (2018); DFSI (2017); GA (2015)

0 0.5 1 km

GDA 1994 MGA Zone 56

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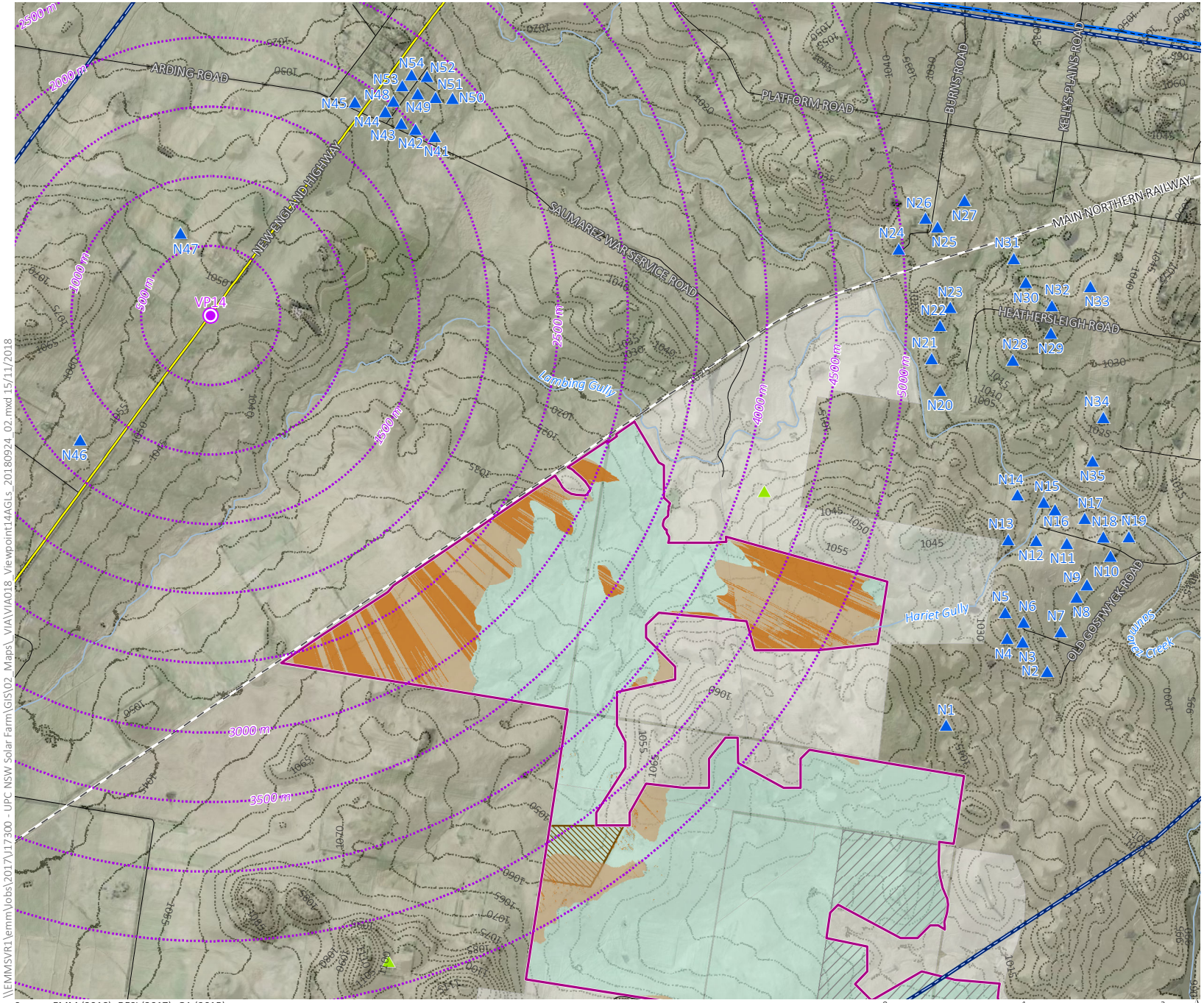
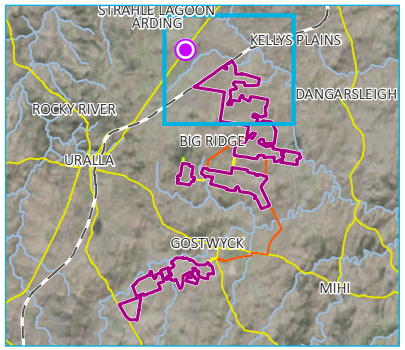
Viewshed analysis - Viewpoint 13

New England Solar Farm
Visual impact assessment
Figure A13

EMM
creating opportunities





KEY

- Existing 330 kV transmission line
- Existing 132 kV transmission line
- Rail line
- Main road
- Local road
- Named watercourse
- Contour (5 m)
- Project boundary

Development footprint

- Solar array
- Potential substation/BESS footprint
- Potential site for construction accommodation village

Sensitive receptors

- Project-related
- Non-project related

Visual impact assessment

- Viewpoint location
- Viewpoint buffer (500 m increments)
- Visible project infrastructure (assumed 4.3 m height) - bare earth surface
- Visible project infrastructure (assumed 4.3 m height) - accounting for shielding features in the landscape (eg vegetation)

Source: EMM (2018); DFSI (2017); GA (2015)

0 1 2 km

GDA 1994 MGA Zone 56

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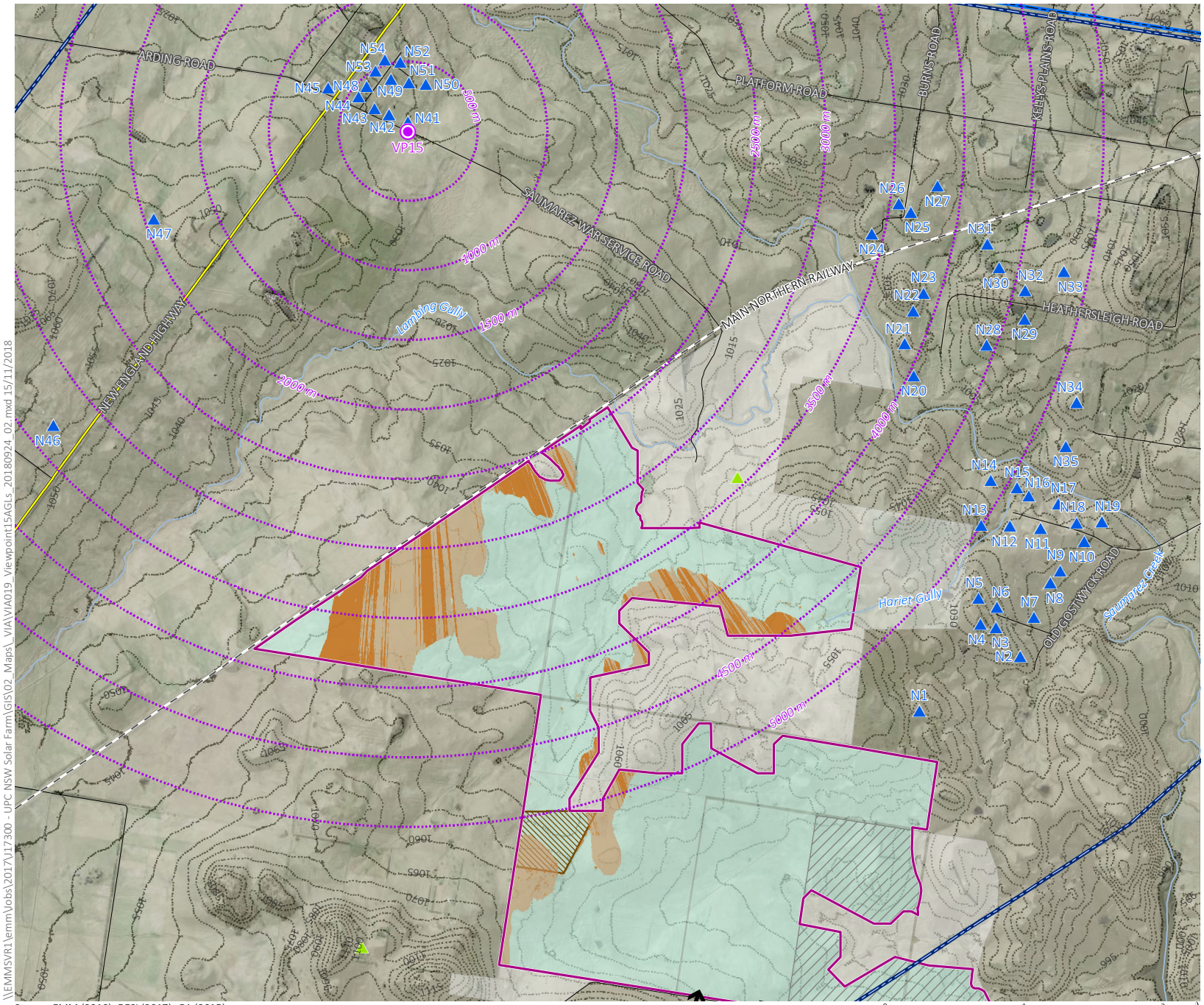
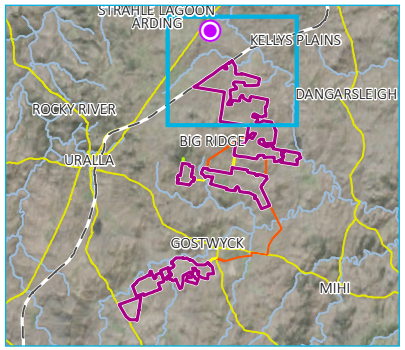
Viewshed analysis - Viewpoint 14

New England Solar Farm
Visual impact assessment
Figure A14

EMM
creating opportunities





KEY

- Existing 330 kV transmission line
- Existing 132 kV transmission line
- Rail line
- Main road
- Local road
- Named watercourse
- Contour (5 m)
- Project boundary

Development footprint

- Solar array
- Potential substation/BESS footprint
- Potential site for construction accommodation village
- Proposed primary site access point

Sensitive receptors

- Project-related
- Non-project related

Visual impact assessment

- Viewpoint location
- Viewpoint buffer (500 m increments)
- Visible project infrastructure (assumed 4.3 m height) - bare earth surface
- Visible project infrastructure (assumed 4.3 m height) - accounting for shielding features in the landscape (eg vegetation)

Source: EMM (2018); DFSI (2017); GA (2015)

0 1 2 km

GDA 1994 MGA Zone 56

N

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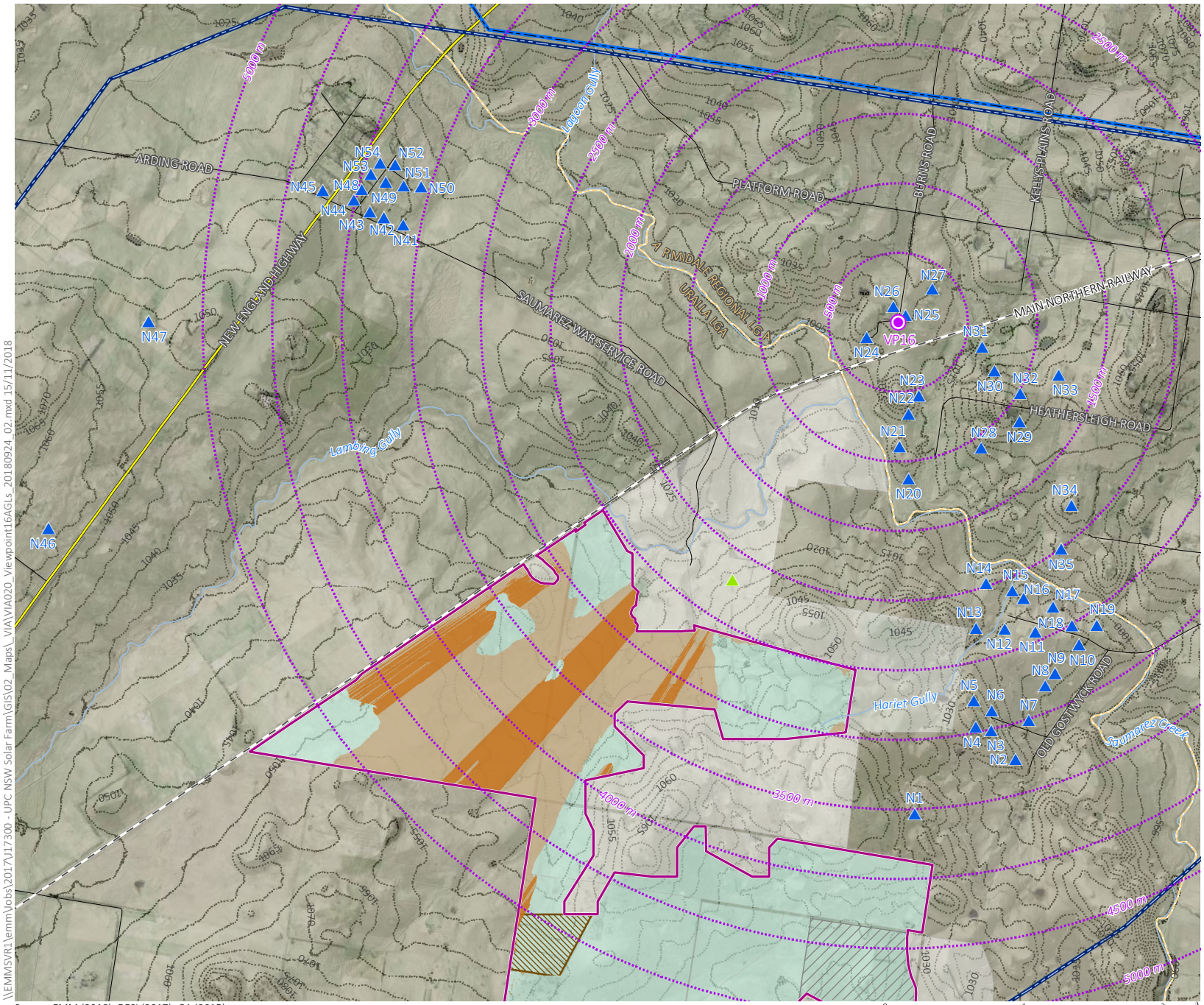
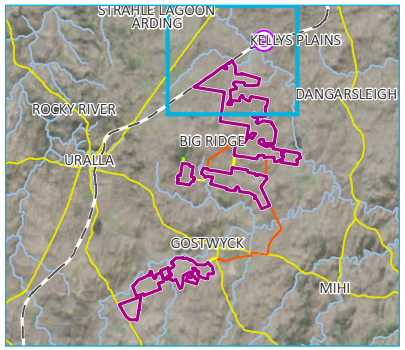
Viewshed analysis - Viewpoint 15

New England Solar Farm
Visual impact assessment
Figure A15

EMM
creating opportunities





KEY

- Existing 330 kV transmission line
- Existing 132 kV transmission line
- Rail line
- Main road
- Local road
- Named watercourse
- Contour (5 m)
- Local government area
- Project boundary

Development footprint

- Solar array
- Potential substation/BESS footprint
- Potential site for construction accommodation village

Sensitive receptors

- Project-related
- Non-project related

Visual impact assessment

- Viewpoint location
- Viewpoint buffer (500 m increments)
- Visible project infrastructure (assumed 4.3 m height) - bare earth surface
- Visible project infrastructure (assumed 4.3 m height) - accounting for shielding features in the landscape (eg vegetation)

Source: EMM (2018); DFSI (2017); GA (2015)

0 1 2 km

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N

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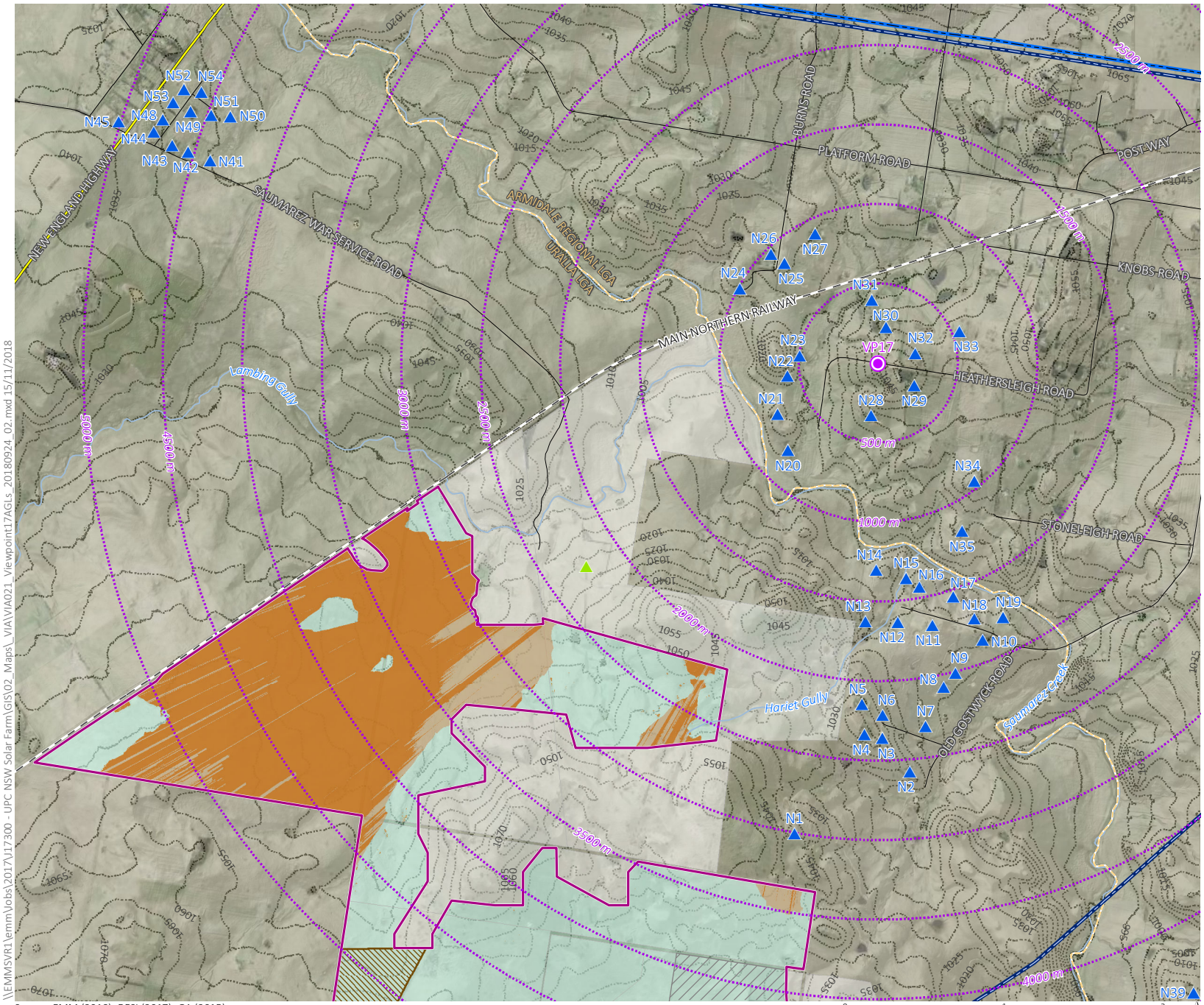
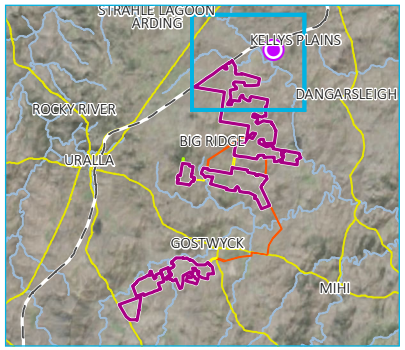
Viewshed analysis - Viewpoint 16

New England Solar Farm
Visual impact assessment
Figure A16

EMM
creating opportunities





KEY

- Existing 330 kV transmission line
- Existing 132 kV transmission line
- Rail line
- Main road
- Local road
- Named watercourse
- Contour (5 m)
- Local government area
- Project boundary

Development footprint

- Solar array
- Potential substation/BESS footprint
- Potential site for construction accommodation village

Sensitive receptors

- Project-related
- Non-project related

Visual impact assessment

- Viewpoint location
- Viewpoint buffer (500 m increments)
- Visible project infrastructure (assumed 4.3 m height) - bare earth surface
- Visible project infrastructure (assumed 4.3 m height) - accounting for shielding features in the landscape (eg vegetation)

Source: EMM (2018); DFSI (2017); GA (2015)

0 1 2 km

GDA 1994 MGA Zone 56

N

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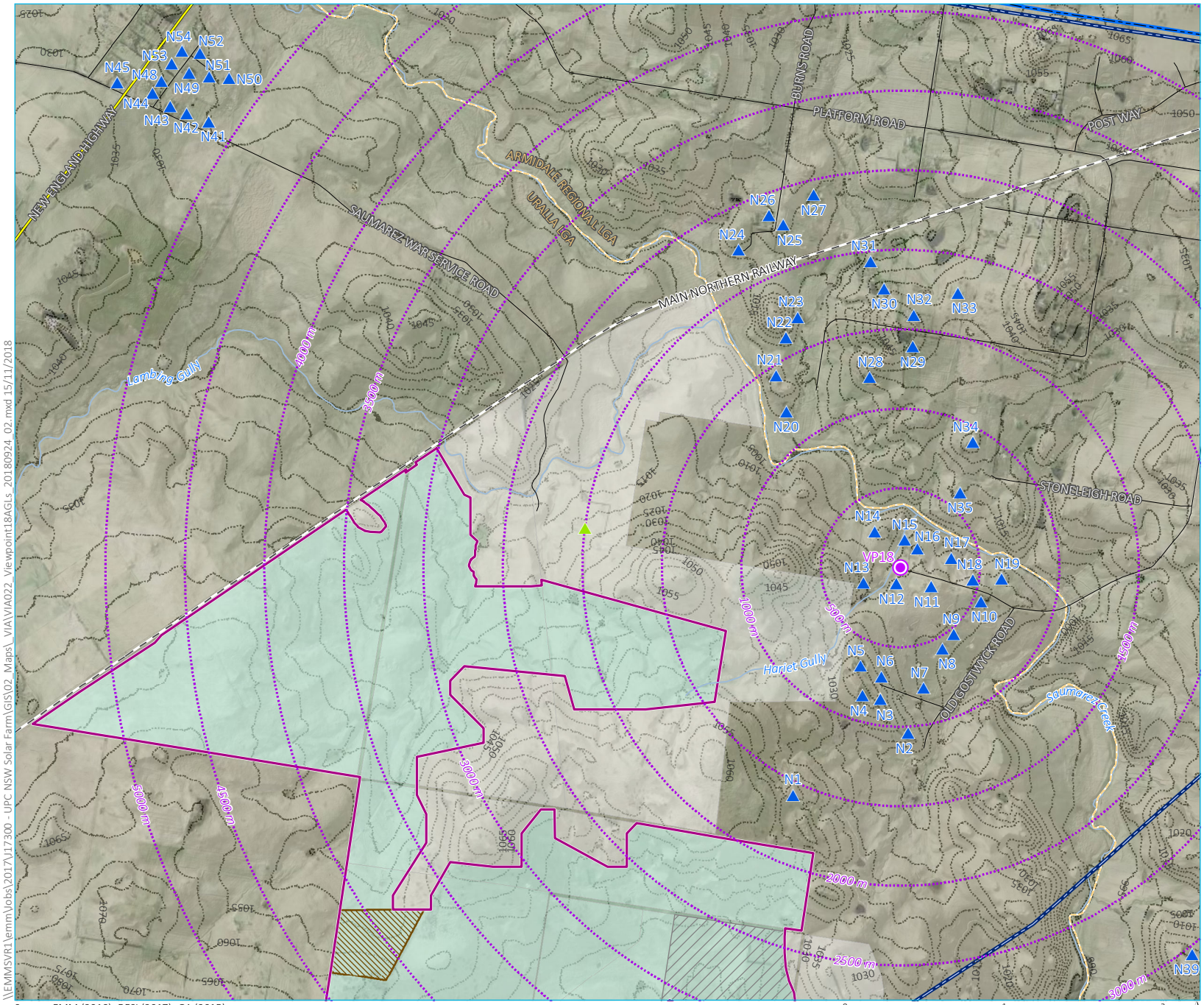
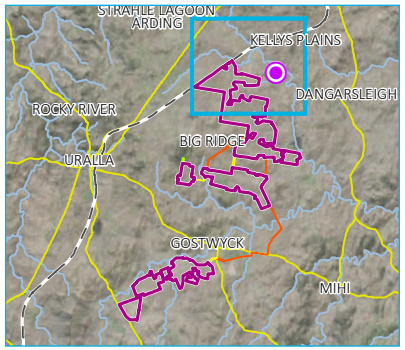
Viewshed analysis - Viewpoint 17

New England Solar Farm
Visual impact assessment
Figure A17

EMM
creating opportunities





KEY

- Existing 330 kV transmission line
- Existing 132 kV transmission line
- Rail line
- Main road
- Local road
- Named watercourse
- Contour (5 m)
- Local government area
- Project boundary

Development footprint

- Solar array
- Potential substation/BESS footprint
- Potential site for construction accommodation village

Sensitive receptors

- Project-related
- Non-project related

Visual impact assessment

- Viewpoint location
- Viewpoint buffer (500 m increments)
- Visible project infrastructure (assumed 4.3 m height) - bare earth surface
- Visible project infrastructure (assumed 4.3 m height) - accounting for shielding features in the landscape (eg vegetation)

\\EMMSVR1\emm\Jobs\2017\J17300 - UPC NSW Solar Farm\GIS\02_Maps_VIA\VIA022_Viewpoint18AGLs_20180924_02.mxd 15/11/2018

Source: EMM (2018); DFSI (2017); GA (2015)

0 1 2 km

GDA 1994 MGA Zone 56

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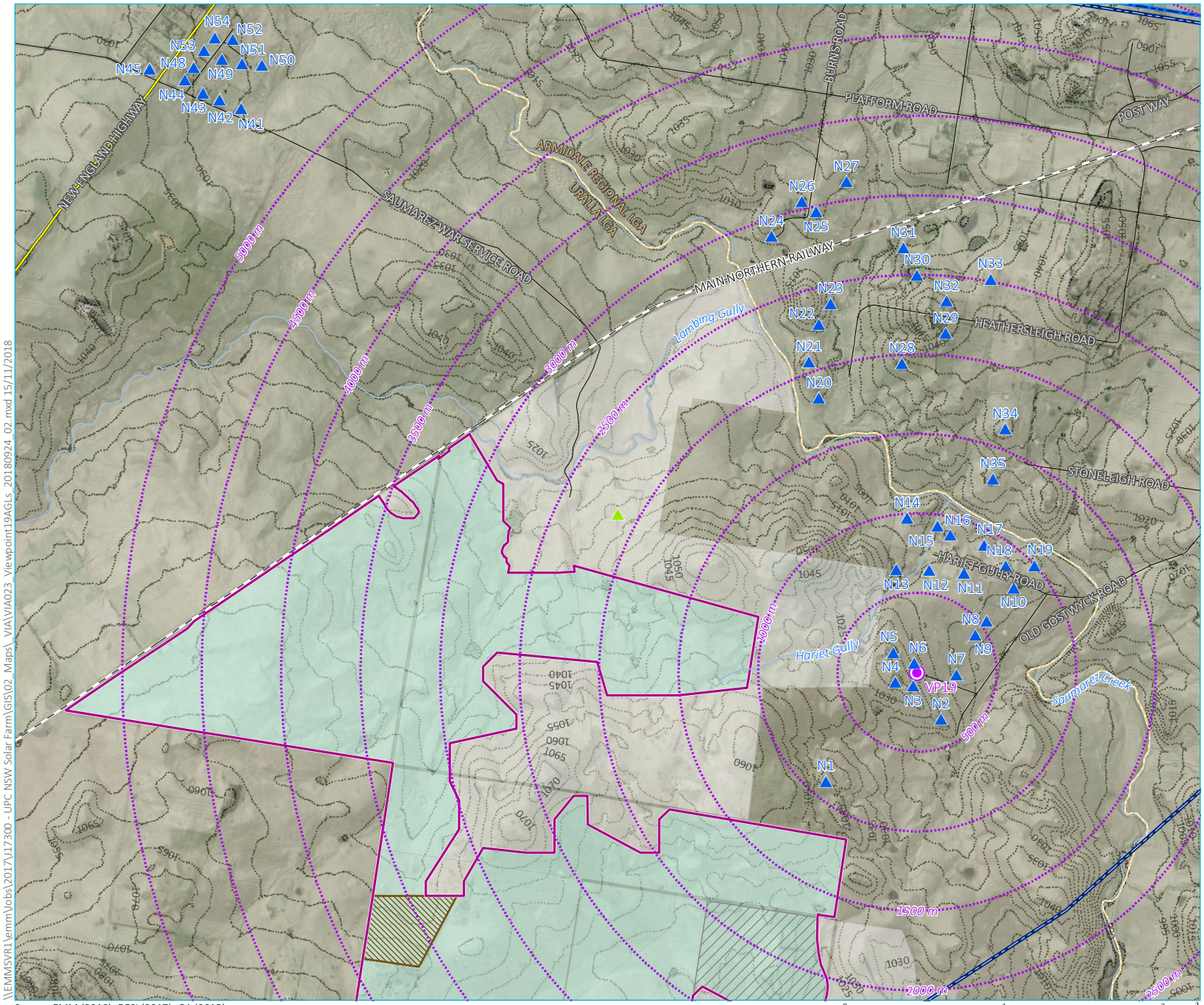
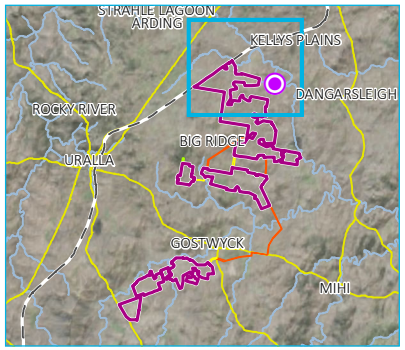
Viewshed analysis - Viewpoint 18

New England Solar Farm
Visual impact assessment
Figure A18

EMM
creating opportunities





KEY

- Existing 330 kV transmission line
- Existing 132 kV transmission line
- Rail line
- Main road
- Local road
- Named watercourse
- Contour (5 m)
- Local government area
- Project boundary

Development footprint

- Solar array
- Potential substation/BESS footprint
- Potential site for construction accommodation village

Sensitive receptors

- Project-related
- Non-project related

Visual impact assessment

- Viewpoint location
- Viewpoint buffer (500 m increments)
- Visible project infrastructure (assumed 4.3 m height) - bare earth surface
- Visible project infrastructure (assumed 4.3 m height) - accounting for shielding features in the landscape (eg vegetation)

Source: EMM (2018); DFSI (2017); GA (2015)

0 1 2 km

GDA 1994 MGA Zone 56

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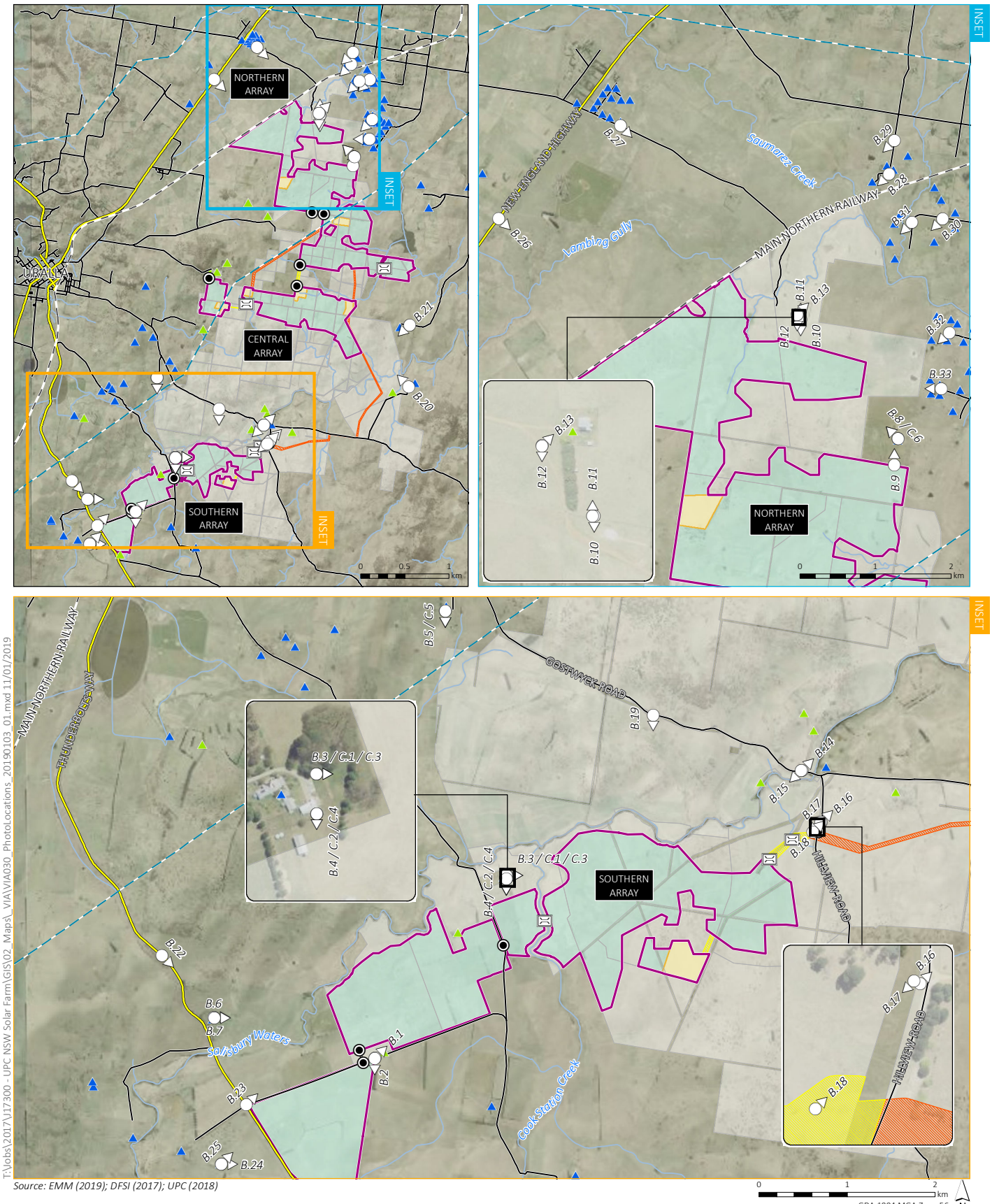
Viewshed analysis - Viewpoint 19

New England Solar Farm
Visual impact assessment
Figure A19

EMM
creating opportunities

Appendix B

Photographs from viewpoints



T:\Jobs\2017\J17300 - UPC NSW Solar Farm\GIS\02_Maps_VIA\VIA030_PhotoLocations_20190103_01.mxd 11/01/2019

Source: EMM (2019); DFSI (2017); UPC (2018)

GDA 1994 MGA Zone 56

KEY

- Photograph location and viewing direction

Sensitive receptors
- Project-related
- Non-project related
- 330 kV transmission line
- Rail line
- Main road
- Local road
- Watercourse/drainage line
- Project boundary

Development footprint
- Solar array
- Potential ETL easement
- Potential site access corridor
- Potential site access/ETL easement
- Potential substation/BESS footprint
- Potential electrical cabling/site access corridor
- Potential creek crossing
- Proposed primary site access point

Photograph locations and viewing directions

New England Solar Farm
Visual impact assessment
Figure B1

EMM creating opportunities

Table B.1 Photograph locations and viewing directions

Photograph	Caption	Latitude	Longitude	View direction	Angle of view	Closest PV array	Distance from closest array (m)
Photograph B.1	Viewpoint 1 – Dwelling on Salisbury Plains Road (S11) - View north-east	-30 43 26.82	151 32 0.9	NE	45	Southern	10
Photograph B.2	Viewpoint 1 – View of Lot 2 of DP 11311 in the southern array area - View south	-30 43 27.059	151 32 0.68	S	180	Southern	3
Photograph B.3	Viewpoint 2 – Dwelling on The Gap Road (S9) - Looking east	-30 42 20.23	151 32 57.84	E	90	Southern	257
Photograph B.4	Viewpoint 2 – Dwelling on The Gap Road (S9) – Looking south	-30 42 21.45	151 32 57.83	S	180	Southern	221
Photograph B.5	Viewpoint 3 – Dwelling on Gostwyck Road (S3) – View south	-30 40 42.47	151 32 33.36	S	180	Central	2924
Photograph B.6	Viewpoint 4 – Dwelling on Thunderbolts Way (S14) – Balcony level – View east	-30 43 11.22	151 30 52.28	E	90	Southern	1064
Photograph B.7	Viewpoint 4 – Dwelling on Thunderbolts Way (S14) – Ground level – View east	-30 43 11.24	151 30 52.49	E	90	Southern	1061
Photograph B.8	Viewpoint 5 - Dwelling on Old Gostwyck Road (N1) – View north-west	-30 36 14.30	151 37 17.70	NW	315	Northern	372
Photograph B.9	Viewpoint 5 – Dwelling on Old Gostwyck Road (N1) – View north	-30 36 25.85	151 37 15.77	N	0	Northern	13
Photograph B.10	Viewpoint 6 – Dwelling on Saumarez War Service Road (N40) – View south	-30 35 22.83	151 36 30.01	S	180	Northern	318
Photograph B.11	Viewpoint 6 – Dwelling on Saumarez War Service Road (N40) – View north towards dwelling	-30 35 22.84	151 36 29.96	N	0	Northern	317
Photograph B.12	Viewpoint 6 – Dwelling on Saumarez War Service Road (N40) – View south	-30 35 20.64	151 36 28.2	S	180	Northern	369
Photograph B.13	Viewpoint 6 – Dwelling on Saumarez War Service Road (N40) – View north-east towards dwelling	-30 35 20.66	151 36 28.2	NE	45	Northern	368
Photograph B.14	Viewpoint 7 – Gostwyck Memorial Chapel and Precinct – Gostwyck Memorial Chapel	-30 41 42.77	151 35 4.61	NE	45	Southern	1080
Photograph B.15	Viewpoint 7 – Gostwyck Memorial Chapel and Precinct – View south-west	-30 41 42.96	151 35 4.32	SW	225	Southern	1072
Photograph B.16	Viewpoint 8 - Deeargee Woolshed from Hillview Road	-30 42 2	151 35 12.67	NE	45	Southern	756
Photograph B.17	Viewpoint 8 - Deeargee Woolshed from Hillview Road - View south-west	-30 42 1.93	151 35 12.45	SW	225	Southern	753

Table B.1 Photograph locations and viewing directions

Photograph	Caption	Latitude	Longitude	View direction	Angle of view	Closest PV array	Distance from closest array (m)
Photograph B.18	Viewpoint 8 – Deeargee Woolshed from Hillview Road – Vegetation stand	-30 42 5.82	151 35 8.88	NE	45	Southern	602
Photograph B.19	Viewpoint 9 – Gostwyck Road - View south	-30 41 21.74	151 34 1.48	S	180	Southern	1356
Photograph B.20	Viewpoint 10 – Gostwyck War Service Road (C6) – View north-west	-30 40 58	151 38 31.14	NW	315	Central	2217
Photograph B.21	Viewpoint 11 - Elliots Road (C5) – View south-west	-30 39 41.71	151 38 33.56	SW	225	Northern	1649
Photograph B.22	Viewpoint 12 – Thunderbolts Way – elevated – View south-east	-30 42 48.09	151 30 30.43	SE	135	Southern	1928
Photograph B.23	Viewpoint 13 – Intersection of Thunderbolts Way and Salisbury Plains Road - View north-east	-30 43 43.57	151 31 5.59	NE	45	Southern	24
Photograph B.24	Viewpoint 13 – View from S17 – View east	-30 44 5.26	151 30 54.71	E	90	Southern	611
Photograph B.25	Viewpoint 13 – View from S17 – View north-east	-30 44 5.15	151 30 54.56	NE	45	Southern	613
Photograph B.26	Viewpoint 14 – New England Highway - View south-east	-30 34 37.51	151 34 0.49	SE	135	Northern	2345
Photograph B.27	Viewpoint 15 – Saumarez War Service Road – View south-east	-30 33 58.53	151 35 1.63	SE	135	Northern	2447
Photograph B.28	Viewpoint 16 - Burns Road (cul-de-sac) – View south-west	-30 34 20.61	151 37 14.84	SW	225	Northern	2490
Photograph B.29	Viewpoint 16 - Burns Road (north of cul-de-sac) - View south-west	-30 34 6.31	151 37 17.7	SW	225	Northern	2834
Photograph B.30	Viewpoint 17 - Heathersleigh Road (elevated location) – View south-west	-30 34 40.21	151 37 41.04	SW	225	Northern	2156
Photograph B.31	Viewpoint 17 - Heathersleigh Road (gully) – View south-west	-30 34 41.57	151 37 25.88	SW	225	Northern	1954
Photograph B.32	Viewpoint 18 - Hariet Gully Road – View south-west	-30 35 29.17	151 37 43.79	SW	225	Northern	1172
Photograph B.33	Viewpoint 19 - Coreys Road - View west	-30 35 53.35	151 37 39.5	W	270	Northern	1040
Photograph C.1	Photomontage from Viewpoint 2 – Dwelling on The Gap Road (S9) - Looking east	-30 42 20.23	151 32 57.84	E	90	Southern	257
Photograph C.2	Photomontage from Viewpoint 2 – Dwelling on The Gap Road (S9) - Looking south	-30 42 21.45	151 32 57.83	S	180	Southern	221
Photograph C.3	Photomontage from Viewpoint 2 – Dwelling on The Gap Road (S9) - Looking east – including vegetation screening	-30 42 20.23	151 32 57.84	E	90	Southern	257
Photograph C.4	Photomontage from Viewpoint 2 – Dwelling on The Gap Road (S9) - Looking south – including vegetation screening	-30 42 21.45	151 32 57.83	S	180	Southern	221

Table B.1 Photograph locations and viewing directions

Photograph	Caption	Latitude	Longitude	View direction	Angle of view	Closest PV array	Distance from closest array (m)
Photograph C.5	Photomontage from Viewpoint 3 – Dwelling on Gostwyck Road (S3) – View south	-30 40 42.47	151 32 33.36	S	180	Central	2924
Photograph C.6	Photomontage from Viewpoint 5 - Dwelling on Old Gostwyck Road (N1) – View north-west	-30 36 14.30	151 37 17.70	NW	315	Northern	372

Photograph B.1 **Viewpoint 1 – Dwelling on Salisbury Plains Road (S11) – View north-east**

Photograph B.2 **Viewpoint 1 – View of Lot 2 of DP 11311 in the southern array area – View south**

Photograph B.3 **Viewpoint 2 – Dwelling on The Gap Road (S9) – Looking east**

Photograph B.4 **Viewpoint 2 – Dwelling on The Gap Road (S9) – Looking south**

Photograph B.5 **Viewpoint 3 – Dwelling on Gostwyck Road (S3) – View south**

Photograph B.6 **Viewpoint 4 – Dwelling on Thunderbolts Way (S14) – Balcony level – View east**

Photograph B.7 **Viewpoint 4 – Dwelling on Thunderbolts Way (S14) – Ground level – View east**

Photograph B.8 **Viewpoint 5 – Dwelling on Old Gostwyck Road (N1) – View north-west**

Photograph B.9 **Viewpoint 5 – Dwelling on Old Gostwyck Road (N1) – View north**

Photograph B.10 **Viewpoint 6 – Dwelling on Saumarez War Service Road (N40) – View south**

Photograph B.11 **Viewpoint 6 – Dwelling on Saumarez War Service Road (N40) – View north towards dwelling**

Photograph B.12 **Viewpoint 6 – Dwelling on Saumarez War Service Road (N40) – View south**

Photograph B.13 **Viewpoint 6 – Dwelling on Saumarez War Service Road (N40) – View north-east towards dwelling**

Photograph B.14 **Viewpoint 7 – Gostwyck Memorial Chapel and Precinct –Gostwyck Memorial Chapel**

Photograph B.15 **Viewpoint 7 – Gostwyck Memorial Chapel and Precinct – View south-west**

Photograph B.16 **Viewpoint 8 – Deeargee Woolshed-from Hillview Road**

Photograph B.17 Viewpoint 8 - Deeargee Woolshed from Hillview Road – View south-west

Photograph B.18 Viewpoint 8 – Deeargee Woolshed from Hillview Road – vegetation stand

Photograph B.19 Viewpoint 9 – Gostwyck Road – View south

Photograph B.20 Viewpoint 10 – Gostwyck War Service Road (C6) – View north-west

Photograph B.21 Viewpoint 11 - Elliots Road (C5) – View south-west

Photograph B.22 Viewpoint 12 – Thunderbolts Way – elevated – View south-east

Photograph B.23 **Viewpoint 13 – Intersection of Thunderbolts Way and Salisbury Plains Road – View north-east**

Photograph B.24 **Viewpoint 13 – View from S17 – View east**

Photograph B.25 **Viewpoint 13 – View from S17 – View north-east**

Photograph B.26 **Viewpoint 14 – New England Highway – View south-east**

Photograph B.27 **Viewpoint 15 – Saumarez War Service Road – View south-east**

Photograph B.28 **Viewpoint 16 – Burns Road (cul-de-sac) – View south-west**

Photograph B.29 **Viewpoint 16 – Burns Road (north of cul-de-sac) – View south-west**

Photograph B.30 **Viewpoint 17 – Heathersleigh Road (elevated location) – View south-west**

Photograph B.31 **Viewpoint 17 – Heathersleigh Road (gully) – View south-west**

Photograph B.32 **Viewpoint 18 – Hariet Gully Road – View south-west**

Photograph B.33 Viewpoint 19 – Coreys Road - View west

Appendix C

Photomontages

Photograph C.1 Photomontage from Viewpoint 2 – Dwelling on The Gap Road (S9) – Looking east

Photograph C.2 Photomontage from Viewpoint 2 – Dwelling on The Gap Road (S9) – Looking south

Note: Structure in the background is a dilapidated dwelling on one of the project landholder's land parcels. No one resides in this structure.

Photograph C.3 **Photomontage from Viewpoint 2 – Dwelling on The Gap Road (S9) – Looking east – including vegetation screening**

Photograph C.4 Photomontage from Viewpoint 2 – Dwelling on The Gap Road (S9) – Looking south – including vegetation screening

Note: Structure in the background is a dilapidated dwelling on one of the project landholder's land parcels. No one resides in this structure.

Photograph C.5 Photomontage from Viewpoint 3 – Dwelling on Gostwyck Road (S3) – View south

Photograph C.6 Photomontage from Viewpoint 5 – Dwelling on Old Gostwyck Road (N1) – View north-west

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