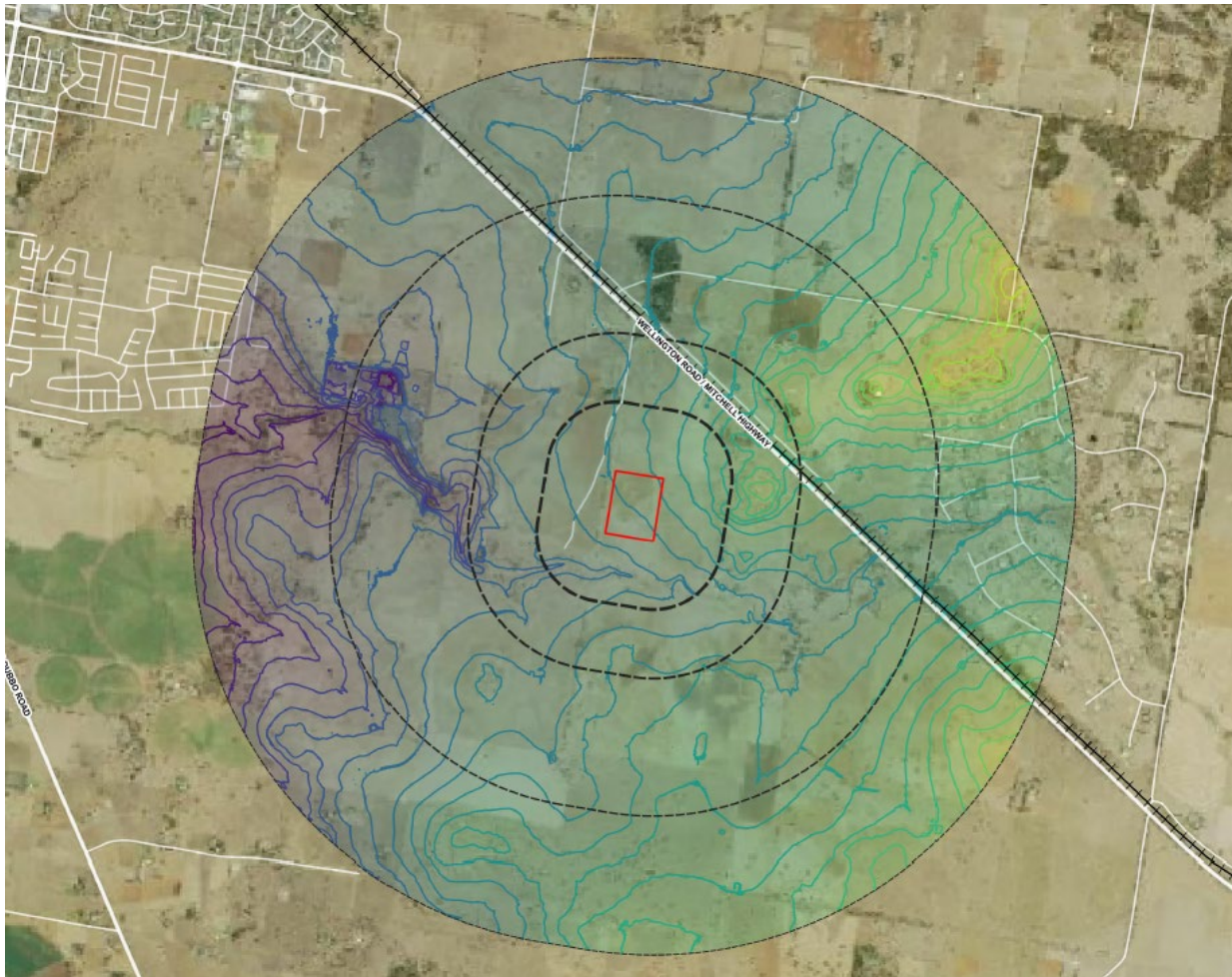


# LANDSCAPE & VISUAL IMPACT ASSESSMENT

## DUBBO SOLAR FARM

47R WELLINGTON ROAD, DUBBO



**CLIENT:** ACENERGY

**DATE:** 4 MARCH 2021

**PREPARED BY:**



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# CONTENTS

<b>1</b>	<b>PROJECT INTRODUCTION</b>	<b>1</b>
1.1	OBJECTIVES	1
1.2	KEY TERMS	1
<b>2</b>	<b>METHODOLOGY</b>	<b>3</b>
2.1	ASSESSMENT FRAMEWORK AND CRITERIA	3
2.1.1	ASSESSMENT CRITERIA: LANDSCAPE CHARACTER	4
2.1.2	ASSESSMENT CRITERIA: LANDSCAPE AND VISUAL EFFECTS	5
2.2	SCOPE OF THE LVIA	9
2.3	DATA COLLECTION	9
<b>3</b>	<b>LANDSCAPE SETTING &amp; CHARACTER</b>	<b>11</b>
3.1	LANDFORM AND TOPOGRAPHY	11
3.2	LANDCOVER / VEGETATION	12
3.3	LAND USE	13
3.4	TEXTURE AND COLOUR	14
3.5	SETTLEMENT AND HUMAN INFLUENCE	15
3.6	RARITY	15
<b>4</b>	<b>PROPOSED DEVELOPMENT</b>	<b>16</b>
4.1	SITE PARTICULARS	16
4.2	LAYOUT AND KEY VISUAL COMPONENTS	16
4.3	CONSTRUCTION AND DECOMMISSIONING	16
<b>5</b>	<b>ASSESSMENT</b>	<b>17</b>
5.1	LANDSCAPE CHARACTER ZONES	17
5.2	LANDSCAPE RECEPTORS	17
5.3	VISUAL RECEPTORS	19
5.3.1	ZONES OF THEORETICAL VISIBILITY ANALYSIS	19
5.3.2	FIELDWORK ANALYSIS	21
5.3.3	POTENTIAL RESIDENTIAL VISUAL RECEPTORS	23
5.3.4	OTHER POTENTIAL VISUAL RECEPTORS	25
<b>6</b>	<b>SUMMARY AND RECOMMENDATIONS</b>	<b>27</b>
6.1	LANDSCAPE AND VISUAL RECEPTORS	27
6.2	CUMULATIVE AND RESIDUAL IMPACTS	27
6.3	CONCLUSION	27
<b>7</b>	<b>REFERENCES</b>	<b>28</b>





## APPENDICES

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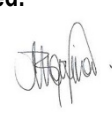
### Appendix 1: Project Design Plans prepared by ACEnergy

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## 1 PROJECT INTRODUCTION

This Landscape and Visual Impact Assessment (LVIA) has been prepared on behalf of ACEnergy (the applicant) to support a development application (DA) for the proposed Dubbo Solar Farm at 47R Wellington Road, Dubbo.

The intent of this LVIA is to provide an assessment of the existing landscape both within the subject site and the surrounding area to determine the potential visual impact of the proposal to the landscape and visual receptors.

de Witt Consulting understand that the assessment of visual impact is subjective, and the individual consideration of visual and landscape effects and the significance of these effects may differ between receptors depending on personal values attached to the landscape.

It is also noted that landscapes are an important consideration because of the value that individuals, communities and public bodies attach to them. Landscapes are a shared resource which are as important in their own right as they are as a public good. Further, it is recognised that landscapes are not static but continue to evolve and change with communities. These landscape changes are often driven by changing requirements for development to meet the needs of a growing population and a changing climate. This includes advances in technology and renewable energy development such as that proposed.

This LVIA demonstrates that the proposal has been formulated having full and proper regard to both the existing landscape and desired future landscape of the area, and that the proposal:

- Is sympathetic to the existing development within the site and surrounding landscape in terms of bulk and scale, and presents harmoniously in views from visual receptors;
- Will not be a dominant feature in the landscape or change the landscape character; and
- Will not pose a significant adverse visual impact to potential receptors.

### 1.1 OBJECTIVES

The objectives of this LVIA are to:

- Identify and analyse the existing landscape character of the site and surrounding area;
- Identify and assess potential visual receptors and viewpoints from which the proposal may have a visual effect;
- Assess the visual significance of the viewpoints and the sensitivity of the potential visual receptors;
- Assess the suitability of the proposal within the surrounding existing landscape and desired future landscape; and
- Recommend mitigation measures where appropriate.

### 1.2 KEY TERMS

Key terms used throughout this LVIA are defined in the following table:

**Table 1-2: Key Terms**

Term	Definition
<b>Close foreground</b>	Areas less than 500m from the subject site, defined as the 500m Visual Catchment, where details are easily discernible and/or occupy a large proportion of the field of view.
<b>Distant</b>	Defined by the 2km-3km Visual Catchment and/or features and elements appear in the horizon.
<b>Effect</b>	The landscape or visual outcome of a proposed change. It may be the combined result of sensitivity together with the magnitude of the change.

Term	Definition
<b>Foreground</b>	Within the 500m-1km Visual Catchment, where details are less distinguishable but the features occupy a large-moderate proportion of the field of view.
<b>Impact</b>	The effect of a proposal, which can be adverse or beneficial, when measured against an existing condition.
<b>Landscape character</b>	A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.
<b>Landscape effect</b>	A change to landscape values as a result of development, which can be either positive or negative.
<b>Landscape receptor</b>	Defined aspect of the landscape resource that has the potential to be affected by a proposal.
<b>Landscape value</b>	The relative value that is attached to different landscapes by present or future generations. Landscape values may include biodiversity, geo-diversity, historic, and aesthetic values, as well as more personal values such as a person's association, memories, knowledge or experiences of that landscape.
<b>Midground</b>	Within the 1km-2km Visual Catchment, where details are not distinguishable and the features occupy minor significance within the field of view.
<b>Sensitivity</b>	A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor.
<b>Significance</b>	A measure of the importance or gravity of the environmental effect, defined by significance criteria specific to the environmental topic.
<b>View</b>	Any sight, prospect or field of vision as seen from a place, and may be wide or narrow, partial or full, pleasant or unattractive, distinctive or nondescript, and may include background, midground and/or foreground elements or features.
<b>Visual amenity</b>	The overall pleasantness of the views people enjoy of their surroundings, which provides an attractive visual setting or backdrop for the enjoyment of activities of the people living, working, recreating, visiting or travelling through an area.
<b>Visual catchment</b>	Areas visible from a combination of locations within a defined setting (may be modelled or field-validated).
<b>Visual effect</b>	Effects on specific views and on the general visual amenity experienced by people.
<b>Visual receptor</b>	Individuals and/or defined groups of people who have the potential to be affected by a proposal.
<b>Visual significance</b>	Used in this instance to describe the weighting that is given to the relative importance of identified landscape values. The landscape values of an area likely to be significant are those that help understand the past, enrich the present, and which will be of value to future generations.



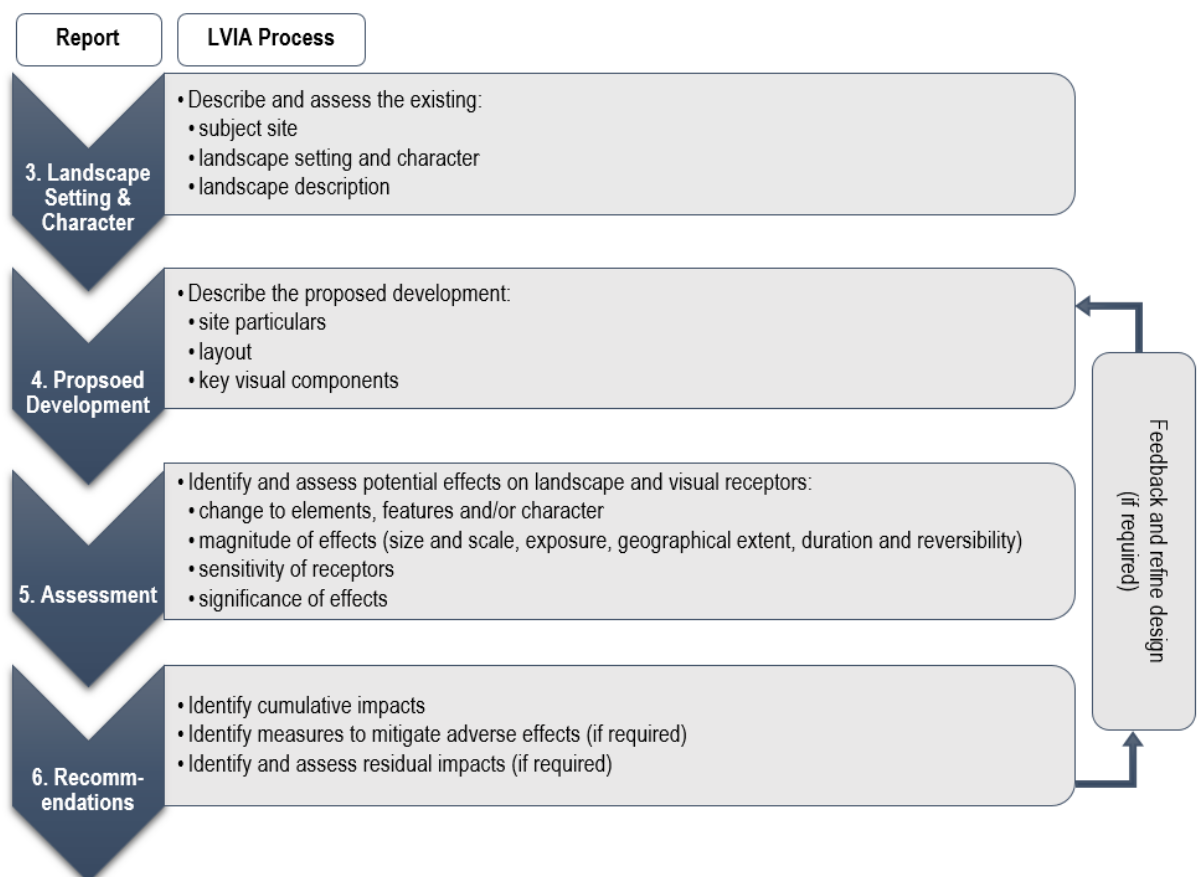
## 2 METHODOLOGY

The potential visual impact on landscape and visual receptors is derived from changes in the landscape, its character and how this is experienced. Effects may have different levels of significance (e.g. high, moderate, low) depending on the sensitivity of the visual receptors and the magnitude of change. Changes to the landscape are more than visual and include a range of physical and perceptual factors. Determining visual impact therefore requires a combination of qualitative and quantitative assessment measures and acknowledgement of limitations.

### 2.1 ASSESSMENT FRAMEWORK AND CRITERIA

The methodology and report structure (Figure 2.1) of this LVIA is primarily based on the *Guidelines for Landscape and Visual Impact Assessment*, Third Edition (Landscape Institute and Institute of Environmental Management & Assessment (IEMA), 2013), which is generally considered industry standard and recognised as best practice. In addition to the above, other key resources this methodology is based on include:

- *Guidance Note for Landscape and Visual Assessment* (Australian Institute of Landscape Architects (AILA), 2018); and
- *Environmental Impact Assessment Practice Note: Guidelines for Landscape Character and Visual Impact Assessment (Roads and Maritime Services (RMS), 2013).*



**Figure 2.1:** LVIA Methodology Process and Report Structure

### 2.1.1 Assessment Criteria: Landscape Character

Landscape character is determined by the way the physical, natural and cultural components within a landscape interact, which together create a distinctive area, or character (Landscape Institute & IEMA, 2013). Although some of these components are relatively objective and are able to be assessed against a standardised set of criteria, landscape character is also defined by aesthetic, perceptual and experiential aspects (landscape values), which are subjective, and based on personal associations and opinions that differ between individuals. It is noted that preferences and values will also differ depending on the context of the landscape (i.e. urban landscape, rural landscape, natural landscape). These are recognised limitations affecting LVIA generally.

To mitigate the subjectivity concerning perceptions and values, this LVIA utilises landscape characteristics that are generally preferred and valued for rural landscapes derived from the literature (Section 2.1). Rural landscape characteristics are used for this assessment due to the RU2 Rural Landscape zoning of the site. These characteristics are presented in Table 2.1 below and will form the assessment criteria to be used in assessing the landscape and visual effects of the proposed development.

**Table 2.1:** Landscape Character Assessment Criteria

Higher preference/ value	Lower preference/ value
<b>Characteristic: Landform/ topography</b>	
<ul style="list-style-type: none"> <li>Elevated landforms and undulating terrain</li> <li>Presence of water bodies</li> <li>Presence of natural rock features</li> <li>Significant landscape features (trees, tree stands, historic relics, windmills)</li> </ul>	<ul style="list-style-type: none"> <li>Uniform or flat with little to no vertical relief</li> <li>Absence of or eutrophied water bodies</li> <li>Eroded areas</li> <li>Unmanaged roads and access tracks</li> </ul>
<b>Characteristic: Landcover/ vegetation</b>	
<ul style="list-style-type: none"> <li>Presence of fauna, distinctive crop rotations, water conditions and climatic conditions</li> <li>Distinctive remnant vegetation located along creek lines, roadsides and paddocks</li> </ul>	<ul style="list-style-type: none"> <li>Areas of soil salinity/ salt scalds or dead, dying or diseased vegetation</li> <li>Recently harvested areas (stumps, debris, abandoned off-cuts)</li> <li>Extensive weed infestation</li> </ul>
<b>Characteristic: Land use</b>	
<ul style="list-style-type: none"> <li>Gradual transition zones between agricultural land and natural landscape</li> <li>Historic features and land use patterns that strengthen local rural character (historic farm machinery, old shearing sheds, windmills and historic buildings)</li> <li>Well maintained buildings and/or structures that support the rural character (including building materials/finishes)</li> </ul>	<ul style="list-style-type: none"> <li>Tips, dumps and landfill areas</li> <li>Land use areas that contrast significantly from local rural landscape characteristics (plantations, mines, housing, utility towers, roads and fencing)</li> <li>Abandoned structures (including farm structures) in a state of disrepair or destruction</li> </ul>
<b>Characteristic: Texture and colour</b>	
<ul style="list-style-type: none"> <li>Diverse colour and contrast or species diversity of cropping</li> <li>Agricultural patterns, colours and textures that complement natural features</li> </ul>	<ul style="list-style-type: none"> <li>Lack of diversity in colour and texture</li> <li>Difficult to distinguish details in the midground</li> <li>No discernible focal points on the horizon</li> </ul>
<b>Characteristic: Settlement and human influence</b>	
<ul style="list-style-type: none"> <li>Scattered settlement pattern and individual structures (silos, windmills, water tanks, historic buildings, bridges, hay bales and dams)</li> <li>Large allotments</li> </ul>	<ul style="list-style-type: none"> <li>Concentrated settlements with uncharacteristic structures (industrial structures; modern housing)</li> <li>Subdivided allotments</li> </ul>
<b>Characteristic: Rarity</b>	
<ul style="list-style-type: none"> <li>Presence of rare elements or features in the landscape or presence of a rare landscape character type</li> </ul>	<ul style="list-style-type: none"> <li>Common elements or features within the region</li> </ul>

(Sources: Department for Planning and Infrastructure, 2007; LMCC, 2013; AILA, 2018; RMS, 2013; Landscape Institute & IEMA, 2013)

## 2.1.2 Assessment Criteria: Landscape and Visual Effects

The overall visual impact of a proposed development is determined by combining the separate assessments of landscape and visual effects as perceived by receptors. **Landscape effects** are changes within or to the landscape as a result of interactions between a proposed development and elements within the landscape or the landscape character itself (landscape receptors), while **visual effects** are the changes of views or visual amenity of the landscape as perceived by people (visual receptors) (Landscape Institute & IEMA, 2013).

As discussed in Section 2.1.1, the significance of landscape and visual effects is also perceived differently by individuals based on personal preferences and values associated to the landscape and views. As with landscape character, these values and the perceived significance of changes can be difficult to quantify and is a recognised limitation of LVIA generally. The key criteria used in the landscape and visual effects assessment is derived from the *Guidelines for Landscape and Visual Impact Assessment* (Landscape Institute and IEMA, 2013) and provided in Table 2.2 along with classifications for describing the degree of landscape and visual effect. As with the landscape character assessment, any value-based criteria will be assessed in accordance with the preferred and valued landscape characteristics as identified in the literature to mitigate subjectivity. The classifications used in this LVIA are based on the above-mentioned Guideline; as such the classification used in this LVIA is “high”, “moderate”, and “low”, specifications of which are provided in Table 2.2.

Further, it is recognised that a level of professional judgement must be utilised when assessing landscape and visual effects as relationships can exist between criteria (i.e. the size and scale, distance and visibility of the effect all influence the susceptibility of the receptor) and must be considered concurrently when determining the most appropriate classification for the effect being assessed. Similarly, some of the classifications for landscape and visual effects can overlap (i.e. the defined measurable distance in metres or kilometres between an effect and the receptor), while others are specific to either landscape or visual effects (i.e. a change to a view does not consequentially change the overall landscape character). These distinctions are clearly defined in Table 2.2 to ensure transparency in the assessment, as far as practicable. Any necessary explanation of influences between criteria will be discussed in Section 5 of this report.



**Table 2.2:** Classification to Assess Landscape and Visual Effect Criteria

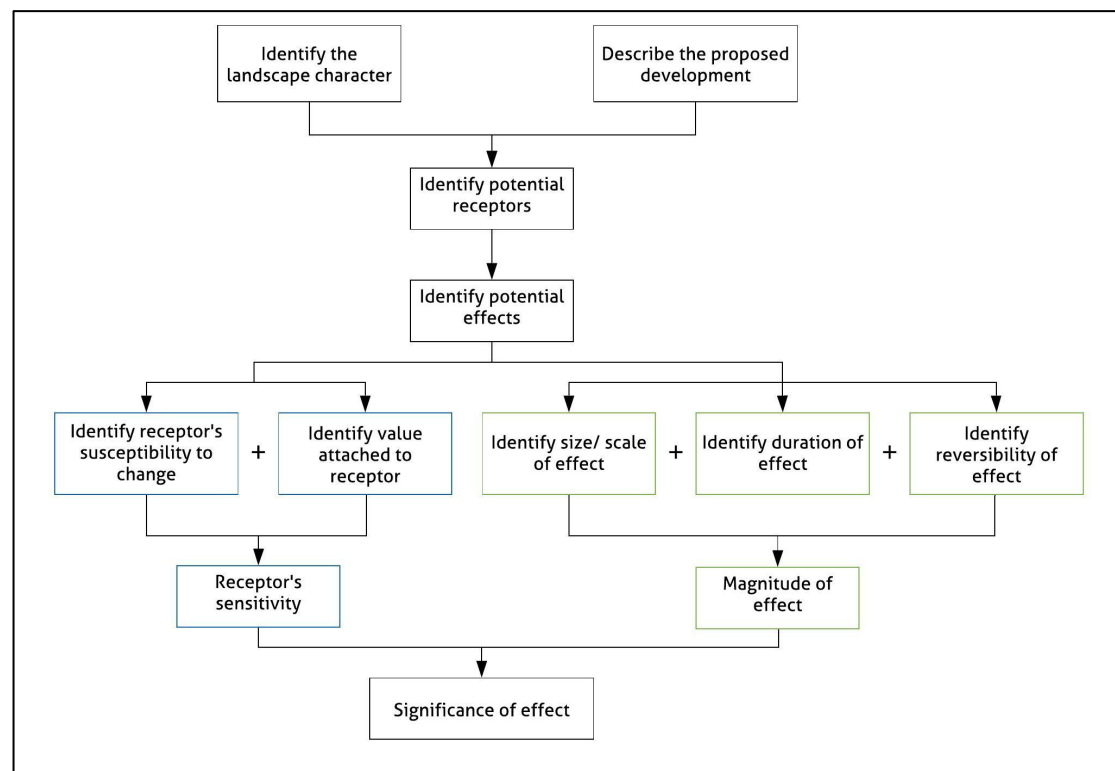
Criteria		High	Moderate	Low
Sensitivity of Receptors	<b>Susceptibility</b>			
	Landscape effect	The degree to which the landscape may accommodate the proposal would potentially result in a number of perceived uncharacteristic and significant changes.	The degree to which the landscape may accommodate the proposal would potentially result in the introduction of prominent elements but may be accommodated to some degree.	The degree to which the landscape may accommodate the proposal would not significantly alter existing landscape character.
	Visual effect	Residents at home in high proximity and visibility to the proposal; visitors to heritage assets or other areas where the views are an important factor to the experience (i.e. lookouts).	People engaged in activities whose attention is likely to be focused on the landscape and on particular views (i.e. scouts/camping groups); people at their place of work whose attention is not focused on their surroundings and where the setting is not important to the quality of working life.	Pedestrians and motorists that would typically have less vested interest and emotional connection to the landscape i.e. view the proposal infrequently, intermittently and/or over a short timeframe.
	<b>Value (Also refer to Table 2.1)</b>			
	Landscape effect	The effect may compromise the specific basis for the value attached to the landscape, for example if the landscape character is valued on an international, national or local scale (i.e. World Heritage Sites, National Parks).	The effect does not compromise the specific basis for the value attached to the landscape.	The existing landscape characteristics are not considered to be generally preferred or valued and therefore the effect does not negatively affect the value attached to the landscape.
	Visual effect	The view appears in guidebooks or on tourist maps, there is a provision of facilities for visitor's enjoyment of the view (i.e. parking places, sign boards and interpretive material); or the local planning designations restrict the introduction of effects that compromise the value of a particular view.	The effect does not compromise the specific basis for the value attached to the particular view.	The view is not considered to be generally preferred or valued and therefore the effect does not negatively affect the value attached to the view.
Magnitude of Effects	<b>Size and scale</b>			
	Landscape effect	Key characteristics of the landscape character may be adversely impacted by the proposal and may result in major alterations to perceived characteristics of the landscape character.	Some characteristics of the landscape character may be altered by the proposal, although the landscape has the capability to absorb these changes without compromising the overall landscape character.	The characteristics of the landscape character are generally robust (evidenced by the existence of artificial elements) and would be minimally affected by the proposal.

Magnitude of Effects (Continued)	Visual effect	Large proportion of the view occupied by the proposal; high degree of contrast or integration of new features/ changes in terms of form, scale and mass, height, colour and texture.	Some change to the view due to loss of existing features and addition of new features in the view without significant change in its composition.	No obvious change to the view due to loss of existing features or addition of new features.
	<b>Frequency of use</b>			
	Landscape effect	Frequently visited or populated areas often used for appreciating the view of the landscape for prolonged periods of time (e.g. residences, lookouts, townships).	Less visited areas with intermittent visitation (e.g. major/secondary roads) with partial visibility from the receptor (i.e. unobstructed features of the proposal from a vehicle while passing within the Visual Catchment of the proposal).	Infrequent visitation brief glimpses of the proposal not in the direct line of sight. (e.g. secondary/local roads, screened visibility).
	Visual effect	As above.	As above.	As above.
	<b>Distance/ Geographical extent</b>			
	Landscape effect	The proposal is a very prominent element in the view from the receptor (i.e. in the close foreground) in the receptor's direct line of sight.	The Project is a noticeable element in the view from the receptor (i.e. in the midground) but not in the direct line of sight.	The Project is difficult to distinguish from the receptor (i.e. in the distance) not in the direct line of sight.
	Visual effect	As above.	As above.	As above.
	<b>Duration</b>			
	Landscape effect	The effect is a permanent feature or lasting over a generation (excess of 30 years).	The effect is a temporary but lasting a significant period of time (i.e. 5 to 30 years).	The effect is temporary lasting a short period of time (i.e. less than 5 years).
	Visual effect	As above.	As above.	As above.
	<b>Reversibility</b>			
	Landscape effect	The effect has irreversible changes to the landscape character or view.	The effect is reversible but may result in some lasting changes to the landscape character or view.	The effect is reversible, and the landscape or view can be returned to the state prior to introduction of the effect.
	Visual effect	As above.	As above.	As above.

(Source: Landscape Institute & IEMA, 2013)

Although the criteria for assessing landscape and visual effects can differ, the process is inherently the same; using the predetermined landscape character alongside the description of a proposed development to identify potential receptors and effects. Subsequently, assessing each effect against the established criteria to determine the **sensitivity** of the receptor and the **magnitude** of the effect. This is an iterative process that is undertaken for each effect and is depicted in Figure 2.2 below. Finally, the sensitivity of the receptors and the magnitude of the effects are successively combined to determine the overall **significance** of the effect, refer to Table 2.3.

Although considerable efforts have been made to avoid subjectivity within this assessment process, it is important to note that a level of professional judgement must still be utilised (Landscape Institute & IEMA, 2013). For example, a receptor may collectively score a “moderate” level of sensitivity and a “moderate” level for the magnitude of the effect, which according to Table 2.3 should result in an overall “moderate” significance of the effect. However, if the proposed development is not visible or does not change the view from the receptor, logical reasoning should indicate a “low” significance of the effect as there is effectively no change in this instance. Where this professional judgement has been employed it is clearly disclosed during the associated assessment



**Figure 2.2:** Process for Assessing Landscape and Visual Effects (Landscape Institute & IEMA, 2013)

**Table 2.3:** Matrix of Significance of Effects

		Magnitude of Effects		
		High	Moderate	Low
Sensitivity of Receptors	High	High Significance	High-Moderate Significance	Moderate Significance
	Moderate	High-Moderate Significance	Moderate Significance	Moderate-Low Significance
	Low	Moderate Significance	Moderate-Low Significance	Low Significance

(Source: Landscape Institute & IEMA, 2002)



## 2.2 SCOPE OF THE LVIA

In defining the scope of this LVIA, a series of Visual Catchments were established to define the extent of the assessments on both the landscape character and the landscape and visual receptors/effects. These are based on the definitions of **close foreground**, **foreground**, **midground** and **distant** provided in the glossary. The Visual Catchments referred to throughout this report are depicted in Figure 2.3 below and are as follows:

- 500m Visual Catchment (close foreground);
- 1km Visual Catchment (foreground);
- 2km Visual Catchment (midground); and
- 3km Visual Catchment (distant).

The Visual Catchments for this LVIA have been spatially defined through a Geographical Information System (GIS) using a variable distance buffer of the site boundary and are depicted throughout the figures within this report.

A preliminary desktop assessment using a Zones of Theoretical Visibility (ZTV) Analysis indicated that receptors within the 3km Visual Catchment are subject to minimal visual effects of the proposal due to its scale and nature, which was confirmed during a site visit.

The ZTV Analysis was used to identify the potential visual receptors to undergo assessment and to reduce the area required to assess on the ground, which can be a lengthy process and unnecessary in cases where the proposed development does not pose a significant change or adverse impacts on the landscape or views. Specific details regarding the ZTV Analysis are provided in Section 5.4. of this report.

Any other variations to the scope are discussed where applicable throughout the report.

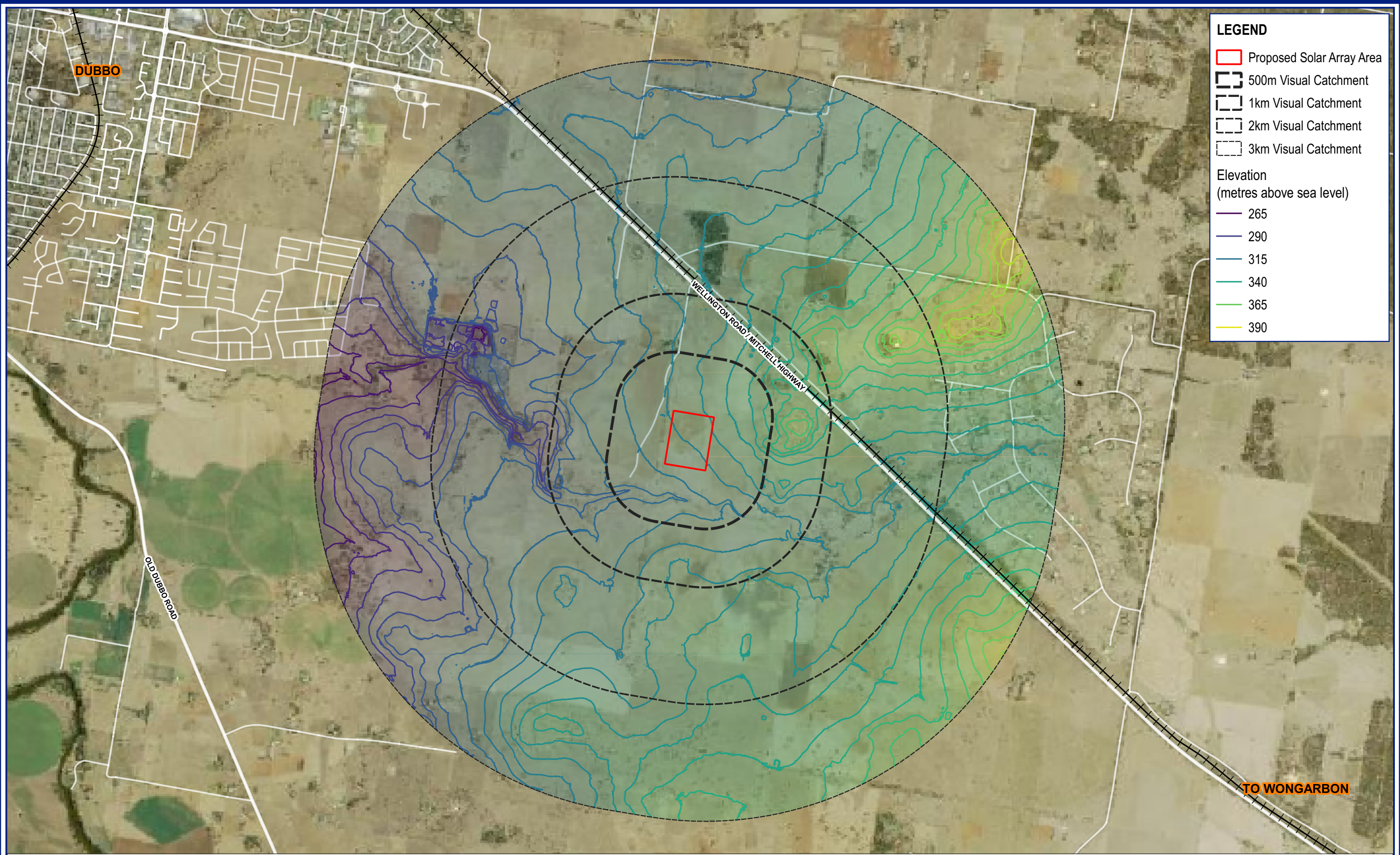
## 2.3 DATA COLLECTION

In preparing this LVIA, a site visit was undertaken to conduct an in-field assessment of the viewpoints and collect photographs.

The following specific data has been collected and relied upon for this LVIA:

- Photographs and associated data sourced by de Witt Consulting;
- Project design plans prepared by ACEnergy;
- Topographical maps and aerial photographs; and
- ZTV Analysis (GIS).





**LEGEND**

Proposed Solar Array Area

500m Visual Catchment

1km Visual Catchment

2km Visual Catchment

3km Visual Catchment

**Elevation**  
(metres above sea level)

- 265
- 290
- 315
- 340
- 365
- 390

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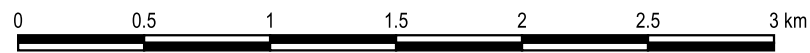
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• PROJECT MANAGEMENT • GIS

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FIGURE 2.3

**VISUAL CATCHMENTS AND SITE CONTEXT**



(© LPI NSW Imagery; NSW Spatial Services 2021; Geoscience Australia)

JOB ADDRESS: 47R WELLINGTON ROAD, DUBBO			
NEW SOUTH WALES   AUSTRALIA			
CLIENT: ACENERGY			
A3 SCALE:	1:30000	DRAWN: MB	JOB REF: 11664
PLAN DATE:	04/03/2021	CHECKED: EM	ISSUE: 01





### 3 LANDSCAPE SETTING & CHARACTER

The scope of this assessment of landscape setting and character includes a description of the landscape characteristics of the subject site and surrounding area. As described in Section 2.1, once the existing landscape character has been evaluated, this will be reviewed alongside the description of the proposed development to identify the potential landscape and visual receptors and the potential effects to these receptors.

The existing landscape character is described in the following subsections, aligning with the landscape characteristics described in Section 2.1.1 and Table 2.1 of this report and assessed accordingly.

#### 3.1 LANDFORM AND TOPOGRAPHY

**Table 3.1:** Assessment of landform/ topography characteristics of the site and surrounding area

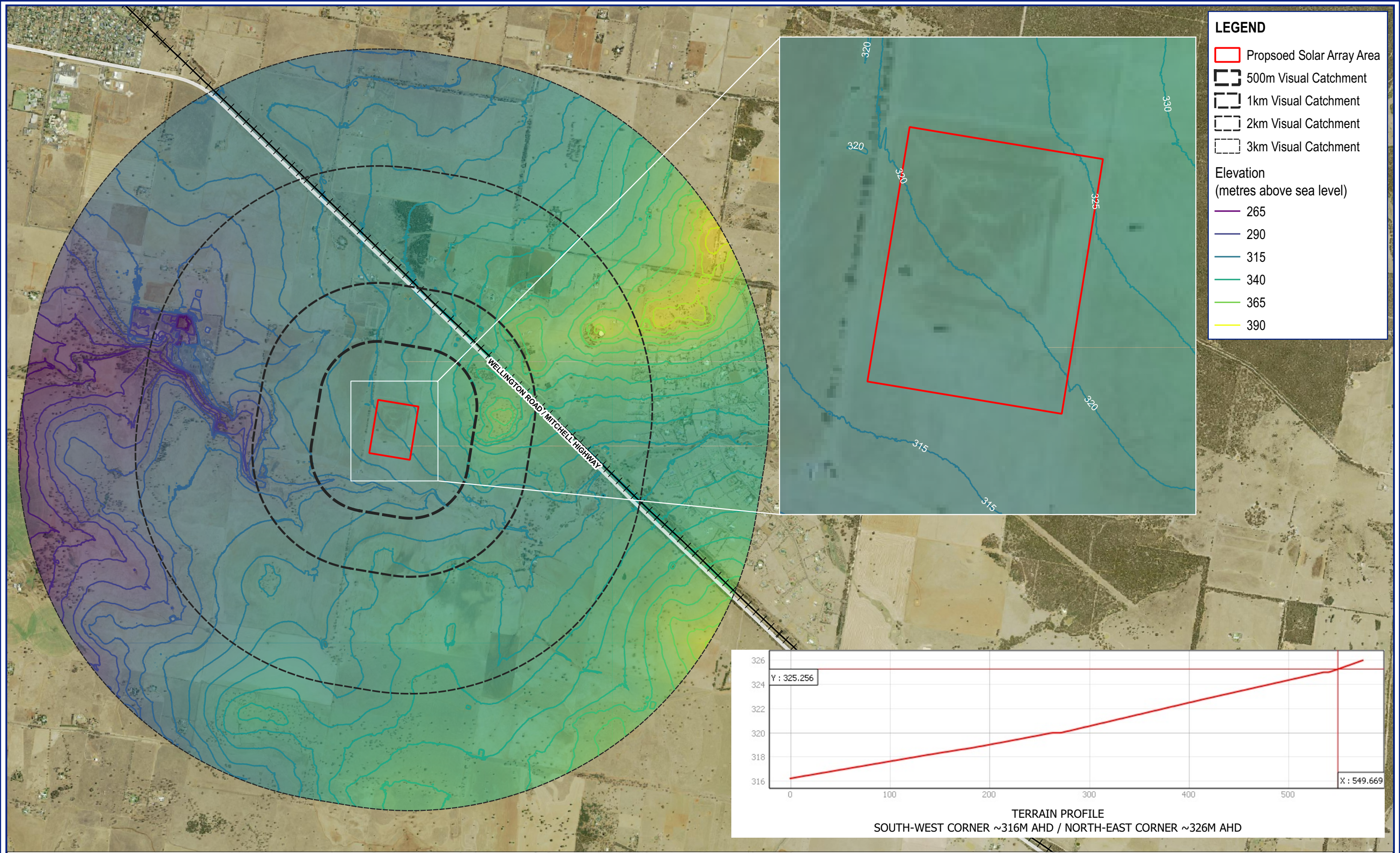
Higher preference/ value			Lower preference/ value	
Characteristic: Landform/ topography				
High	High-Moderate	Moderate	Moderate-Low	Low
<ul style="list-style-type: none"><li>• Elevated landforms and undulating terrain</li><li>• Presence of water bodies</li><li>• Presence of natural rock features</li><li>• Significant landscape features (trees, tree stands, historic relics, windmills)</li></ul>			<ul style="list-style-type: none"><li>• Uniform or flat with little to no vertical relief</li><li>• Absence of or eutrophied water bodies</li><li>• Eroded areas</li><li>• Unmanaged roads and access tracks</li></ul>	

The surrounding landscape is generally consistent with gradual undulations and no main ridgelines. Figure 3.1 provides an overview of the topography within the 3km Visual Catchment, which shows the terrain is mostly situated between 315 to 340 metres above sea level. The Holcim quarry to the west of the Visual Catchment is an outlier. The site itself is largely level gradually declining from north (~326m AHD) to south (~316m AHD). The site itself does not present opportunities for significant views of water bodies, natural rock features or significant landscape features.

Figure 3.1 illustrates the topography of the site and surrounding area, which has been created using a Digital Elevation Model (DEM) of two (2) metre contours. For legibility reasons, the contour lines shown on this figure are set to five (5) metre intervals.





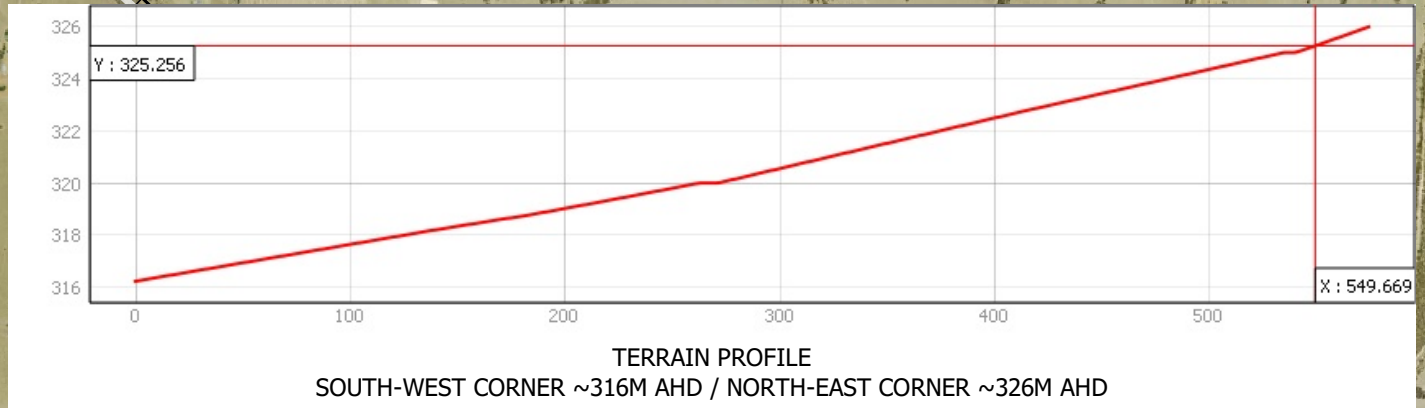


**LEGEND**

- Proposed Solar Array Area
- 500m Visual Catchment
- 1km Visual Catchment
- 2km Visual Catchment
- 3km Visual Catchment

Elevation  
(metres above sea level)

- 265
- 290
- 315
- 340
- 365
- 390



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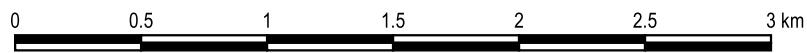


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FIGURE 3.1

TOPOGRAPHY



(© LPI NSW Imagery; NSW Spatial Services 2021; Geoscience Australia)

JOB ADDRESS: 47R WELLINGTON ROAD, DUBBO			
NEW SOUTH WALES   AUSTRALIA			
CLIENT: ACENERGY			
A3 SCALE:	1:30000	DRAWN:	MB
PLAN DATE:	04/03/2021	CHECKED:	EM

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### 3.2 LANDCOVER / VEGETATION

**Table 3.2:** Assessment of landcover/ vegetation characteristics of the site and surrounding area

Higher preference/ value			Lower preference/ value	
Characteristic: Landcover/ vegetation				
High	High-Moderate	Moderate	Moderate-Low	Low
<ul style="list-style-type: none"><li>• Presence of fauna, distinctive crop rotations, water conditions and climatic conditions</li><li>• Distinctive remnant vegetation located along creek lines, roadsides and paddocks</li></ul>		<ul style="list-style-type: none"><li>• Areas of soil salinity/ salt scalds or dead, dying or diseased vegetation</li><li>• Recently harvested areas (stumps, debris, abandoned off-cuts)</li><li>• Extensive weed infestation</li></ul>		

The general landcover/ vegetation of the surrounding landscape does not vary significantly, with scattered vegetation dominating the landscape. The site itself is largely devoid of vegetation with the exception of scattered trees to the north-east and extensive areas of weeds.



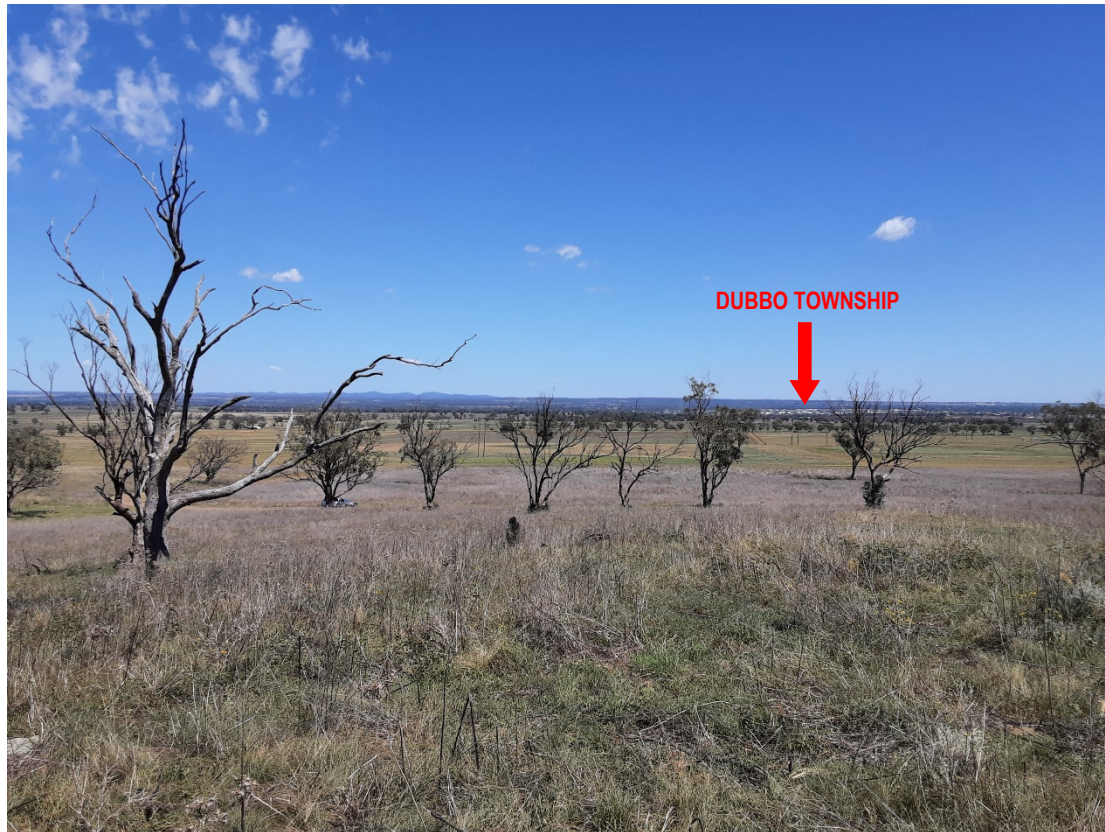
### 3.3 LAND USE

**Table 3.3:** Assessment of land use characteristics of the site and surrounding area

Higher preference/ value			Lower preference/ value	
Characteristic: Land use				
High	High-Moderate	Moderate	Moderate-Low	Low
<ul style="list-style-type: none"><li>• Gradual transition zones between agricultural land and natural landscape</li><li>• Historic features and land use patterns that strengthen local rural character (historic farm machinery, old shearing sheds, windmills and historic buildings)</li><li>• Well maintained buildings and/or structures that support the rural character (including building materials/finishes)</li></ul>			<ul style="list-style-type: none"><li>• Tips, dumps and landfill areas</li><li>• Land use areas that contrast significantly from local rural landscape characteristics (plantations, mines, housing, utility towers, roads and fencing)</li><li>• Abandoned structures (including farm structures) in a state of disrepair or destruction</li></ul>	



The surrounding landscape does provide for a gradual transition between agricultural land and natural landscapes, however the transition into the Dubbo township itself is in contrast quite stark. Notwithstanding, the general surrounding area is considered to be commensurate of the historic rural character and few abandoned structures are located in prominent locations.



### 3.4 TEXTURE AND COLOUR

**Table 3.4:** Assessment of settlement and texture and colour characteristics of the site and surrounding area

Higher preference/ value			Lower preference/ value	
Characteristic: Texture and colour				
High	High-Moderate	Moderate	Moderate-Low	Low
<ul style="list-style-type: none"><li>Diverse colour and contrast or species diversity of cropping</li><li>Agricultural patterns, colours and textures that complement natural features</li></ul>		<ul style="list-style-type: none"><li>Lack of diversity in colour and texture</li><li>Difficult to distinguish details in the midground</li><li>No discernible focal points on the horizon</li></ul>		

The surrounding landscape does not offer a largely diverse colour palette or contrast in diversity of cropping, agricultural patterns, colours or textures. Notwithstanding, most notably the rich red soils (where exposed) provided this contrast and diversity, resulting in a higher value texture and colour. The landscape is considered overall uniform and at times difficult to distinguish details in the midground. The horizon focal points were distant vegetation and/or the contrast of the Dubbo township.





### 3.5 SETTLEMENT AND HUMAN INFLUENCE

**Table 3.5:** Assessment of settlement and human influence characteristics of the site and surrounding area

Higher preference/ value		Lower preference/ value		
Characteristic: Settlement and human influence				
High	High-Moderate	Moderate	Moderate-Low	Low
<ul style="list-style-type: none"><li>Scattered settlement pattern and individual structures (silos, windmills, water tanks, historic buildings, bridges, hay bales and dams)</li><li>Large allotments</li></ul>		<ul style="list-style-type: none"><li>Concentrated settlements with uncharacteristic structures (industrial structures; modern housing)</li><li>Subdivided allotments</li></ul>		

The surrounding area, particularly within the 3km Visual Catchment and further south demonstrates high-value settlement and human influence characteristics with scattered settlement patterns and large allotments. Smaller subdivisions are provided on the northern side of Mitchell Highway and the Dubbo township itself.



(Source: LPI NSW Imagery)

### 3.6 RARITY

**Table 3.6:** Assessment of rarity characteristics of the site and surrounding area

Higher preference/ value		Lower preference/ value		
Characteristic: Rarity				
High	High-Moderate	Moderate	Moderate-Low	Low
<ul style="list-style-type: none"><li>• Presence of rare elements or features in the landscape or presence of a rare landscape character type</li></ul>		<ul style="list-style-type: none"><li>• Common elements or features within the region</li></ul>		

No significant cultural features are evident in the area. No significant environmental features or rare landscape character types are present within the site or surrounding landscape.

## 4 PROPOSED DEVELOPMENT

### 4.1 SITE PARTICULARS

The site is located at 47R Wellington Road, Dubbo, which consists of a number of individual allotments, including Lots 3 and 4 in DP252285, Lot 10 in DP754287 and Lots 95, 190 and 303 in DP754308.

It is irregular in shape with an area of approximately 183 hectares (ha).

### 4.2 LAYOUT AND KEY VISUAL COMPONENTS

The indicative layout and indicative key visual components of the proposal considered in this LVIA are depicted in **Appendix A**, covering an area of approximately 16.5 ha and include:

- Solar PV installation mounted on single-axis tracking racks (approximately 1.4m high at horizontal);
- Chain mesh security fencing approximately 1.8m high;
- Two rows of landscape screening inside of the fence, including approximately 3m high shrubs and 1.5m high understorey plants with a total width of 5m (at maturity). Row 1 to be offset 1.5m from the fence and Row 2 to be offset 2.5m from the fence;
- 5 x energy storage containers approximately 13m long x 2.5m wide x 3.3m high;
- 1 x central inverter approximately 13m long x 2.5m wide x 3.3m high;
- 1 x high voltage switchboard approximately 5m long x 5m wide x 4.3m high; and
- 3 x overhead transmission poles approximately 0.6m diameter x 12m high.

### 4.3 CONSTRUCTION AND DECOMMISSIONING

The project will have at least three (3) main phases; construction, operation and decommission. Each phase is anticipated to have a varying degree of visual impact and duration. Each phase involves various activities, machinery, equipment and structures as detailed below.

The visual considerations from the construction phase include (but are not limited to):

- Construction of internal access tracks and laydown areas;
- Installation of site office, maintenance sheds and other buildings;
- Site preparation earthworks for installation of panel supports;
- Installation of panel supports and solar panel erection;
- Installation of the energy storage containers;
- Overhead electrical connections; and
- Landscaping;
- Fencing; and
- Signage.

The operational period can run for approximately 30 years, the visual effects of which this LVIA is primarily based. This phase includes those items listed in Section 4.2 above.

During decommissioning, all infrastructure can be removed from the site and the land restored to its original use.

## 5 ASSESSMENT

As described in the methodology, the overall visual impact of a proposed development is determined by combining the separate assessments of landscape and visual effects as perceived by receptors. Landscape effects are changes within or to the landscape as a result of interactions between a proposed development and elements within the landscape or the landscape character itself (landscape receptors), while visual effects are the changes of views or visual amenity of the landscape as perceived by people (visual receptors) (Landscape Institute & IEMA, 2013).

### 5.1 LANDSCAPE CHARACTER ZONES

Landscape Character Zones are described as having strongly defined spatial qualities and/or features, distinct from areas immediately adjacent (RMS, 2013; Landscape Institute & IEMA, 2013). Although these are separate from Environmental Planning Instrument (EPI) zoning, there is typically a high degree of correlation between these planning designations and the landscape characteristics that define the Landscape Character Zones. EPI zoning may place specific planning controls over a single parcel of land, while Landscape Character Zones are more general and can encompass multiple EPI zones if there are shared spatial qualities or features across the landscape.

As stated, the proposal is located within the RU2 Rural Landscape zone. The landscape setting and character description in Section 3 demonstrates that the site and surrounding landscape is generally consistent and does not provide any notable variations in landscape character. Additionally, the landscape is considered to be consistent with objectives of the land use zones for the RU2 Rural Landscape zone as set out in the Dubbo Local Environmental Plan 2011:

- *“To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.*
- *To maintain the rural landscape character of the land.*
- *To provide for a range of compatible land uses, including extensive agriculture.”*

### 5.2 LANDSCAPE RECEPTORS

**Landscape receptor** refers to a defined aspect of the landscape that has the potential to be affected by a proposal. Landscape receptors can include the constituent elements of the landscape; its specific aesthetic or perceptual qualities, and the landscape character itself (Landscape Institute & IEMA, 2013). As such, the landscape characteristics described in Table 2.1 (i.e. landform/ topography; landcover/ vegetation; land use; texture and colour; settlement and human influence; and, rarity) are considered to be landscape receptors for the purpose of this assessment. As stated, the landscape receptor assessment criteria utilises the most and least preferred and valued characteristics for urban landscapes derived from the literature (Table 2.1) as a means of mitigating subjectivity when evaluating these characteristics.

As stated in the methodology, the assessment of landscape effects utilises a “high”, “moderate”, and “low” category scale, which is shortened to H, M, L, respectively, for the assessment in Table 5.2 below.

The sensitivity of the landscape receptors and the magnitude of the landscape effects are assessed against the criteria provided in Table 2.2, while the overall significance of each effect is determined using the matrix illustrated in Table 2.3. The assessment of landscape effects on landscape receptors is provided in Table 5.2 below.

In accordance with the assessment provided in Section 3 and Tables 3.1 to 3.6, the Scenic Quality Rating is confirmed to be ‘moderate’. Accordingly, the ‘value’ assigned to each of the landscape receptors in Table 5.2 below is assigned ‘moderate’.



**Table 5.2:** Assessment of landscape effects on landscape receptors

Landscape Receptor	Sensitivity of Receptors		Magnitude of Effect					Description	Significance of Effect
	Susceptibility	Value	Size & scale	Frequency of use	Distance/ Geographical extent	Duration	Reversibility		
<b>Landform/ topography</b>	L	L	L	L	L	H	L	The proposal does not involve excavation of land and will not result in any significant change to the existing landform/topography of the surrounding landscape.	Low
<b>Landcover/ vegetation</b>	L	L	L	L	L	H	L	The site is largely cleared and only 2 trees are proposed to be removed. The proposal will not significantly alter the existing landcover/vegetation in the landscape.	Low
<b>Land use</b>	L	M	L	L	L	H	L	Solar installations, landscaping, fencing and containers (ancillary buildings) are a common feature within the Dubbo regional landscape for both commercial, and rural-residential purposes. The inclusion of the proposal is not envisaged to significantly alter the existing land use patterns in the landscape.	Low
<b>Texture/ colour</b>	L	L	L	L	L	H	L	The introduction of the proposed infrastructure and associated structures will introduce a new scale, colour and texture to the site area; however, this will have limited to nil affect on the surrounding landscape due to the small-scale nature of the proposal.	Low
<b>Settlement &amp; human influence</b>	L	L	L	L	L	H	L	As stated, the proposal is small in scale and is not envisaged to have any significant effects on settlement patterns. The site is not required to undergo further subdivision for the proposal.	Low
<b>Rarity</b>	L	L	L	L	L	H	L	The existing landscape character and features are common within both the Dubbo region and rural landscapes generally. The proposal is not considered to adversely impact this.	Low

## 5.3 VISUAL RECEPTORS

Visual receptor refers to individual or defined groups of people who have the potential to be affected by a proposal, where visual effects on specific views and on the general visual amenity are experienced by people.

As discussed in Section 2.1, despite considerable efforts being made to avoid subjectivity within this assessment process, it is important to note that a level of professional judgement must still be utilised (Landscape Institute & IEMA, 2013). For example, a receptor may collectively score a 'moderate' level of sensitivity and a 'moderate' level for the magnitude of the effect, which according to Table 2.3 should result in an overall 'moderate' significance of the effect; however, if the proposed development is not visible or does not change the view from the receptor, logical reasoning should indicate a 'low' significance of the effect as there is no change to the landscape in this instance. Where applicable, these are discussed throughout the assessment.

### 5.3.1 Zones of Theoretical Visibility Analysis

A ZTV Analysis was conducted for the extent of the Visual Catchments to assist with identifying key potential receptors and areas to target for assessment during the fieldwork. This was conducted using a GIS tool called 'viewshed'. The key aims of this analysis is to identify potential visual receptors to undergo assessment and to reduce the area required to physically visit and assess on the ground, which can be a lengthy process and unnecessary in cases where the proposed development does not pose a significant adverse impact on the landscape. The ZTV Analysis uses elevation data to determine the visibility of a target within an area, or in this case, Visual Catchments. As stated, the results of the analysis are theoretical only and recognising the limitations of its use can assist with understanding the results of the analysis.

#### *Accuracy*

It is important to note that the proposed development in its entirety is unlikely to be viewed from one single viewpoint as it is not a dominant feature within the landscape. The ZTV Analysis completed for this LVIA (Figures 5.1) is based on a two (2) metre elevation terrain model (DEM) derived from NSW Spatial Services via Geoscience Australia's Elevation Information System. The vertical accuracy of this data, by comparing elevation points against survey check points on bare open ground, is typically calculated at the 95 percent confidence level as a function of vertical Root Mean Square Error. Even with a high degree of accuracy of the DEM, ZTV Analysis has inherent limitations and does not negate the need for assessment on the ground (i.e. site visit).

#### *Limitations*

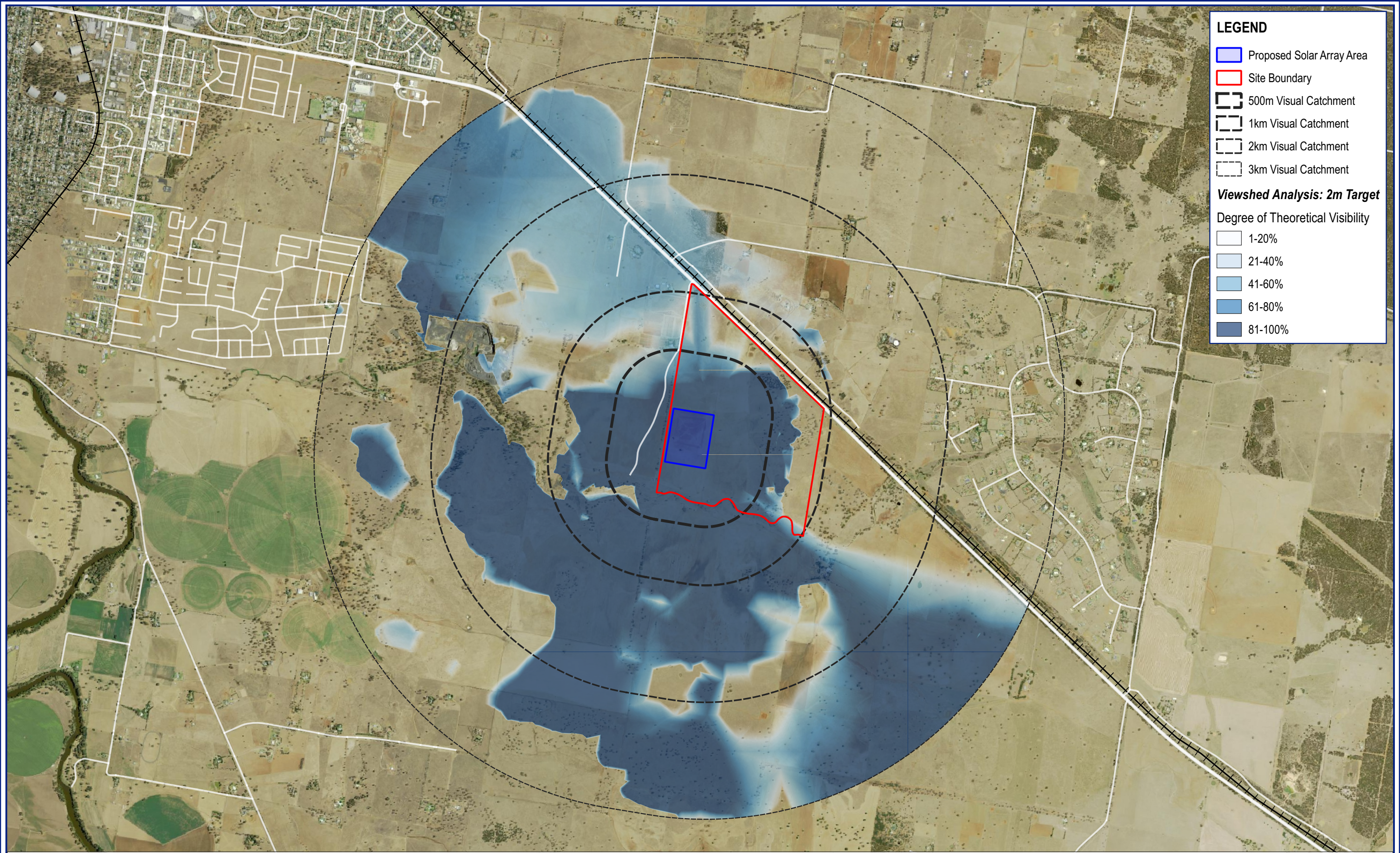
Firstly, it is not common practice to include other land use or topographical data when processing the viewshed, therefore the results do not account for features or "obstructions" (i.e. buildings, structures, vegetation etc) that have screening effects. Accordingly, false-positives are a common occurrence. Further, this type of analysis does not account for the "perspective" as viewed by the human eye, where objects appear smaller with distance. The earth curvature can also have an influence on screening potential, however given the size and scale of the proposed development in relation to the earth curvature this is not considered necessary to include in this case.

The heights of the viewer/ receptors and the proposed development are also integral to the analysis. In this instance, the receptor height is set at 1.6m, which is considered average viewing level from a human eye, and the proposal height is set to 2m, which is a generous height given the tracking system will be as low as 1.4m for a large portion of the day. This 'viewshed' is shown in blue on Figure 5.1 and explained further in the following subsection.

#### *Results*

The ZTV Analysis in Figure 5.1 illustrates the degree of theoretical visibility through shading, where the darkest shading represents a higher degree of visibility. The areas that are not shaded are those with no theoretical visibility and therefore do not require further assessment.





**LEGEND**

Proposed Solar Array Area

Site Boundary

500m Visual Catchment

1km Visual Catchment

2km Visual Catchment

3km Visual Catchment

**Viewshed Analysis: 2m Target**

Degree of Theoretical Visibility

1-20%

21-40%

41-60%

61-80%

81-100%

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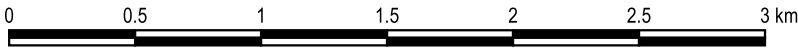
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FIGURE 5.1

ZONES OF THEORETICAL VISIBILITY



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### 5.3.2 Fieldwork Analysis

As stated, the fieldwork confirmed a significant number of false-positives and indicated that very few of the identified areas actually have visibility of the site or potential visual effect from the proposal. The fieldwork also confirmed that there were negligible to no views of the site or potential visual effects from the proposed development to many areas within the Visual Catchments. As indicated in the results discussion above, this is primarily due to visual obstructions from existing vegetation and development as well as slight variations in landform to what is indicated from the DEM that become evident when on the ground.

It is determined that any views of the proposal would not result in a prominent change to the views of the landscape and may be difficult to distinguish from existing elements owing to the scale of the proposal.

As an example, the existing solar installation known as the South Keswick Solar Farm (part of the Dubbo Solar Hub) was viewed from similar visual catchments to that used in this LVIA. Images were gathered to visually demonstrate how a constructed and operating solar installation is viewed within the same landscape. Importantly, the South Keswick Solar Farm does not currently have landscape screening and is a similar design to that proposed with a single-axis tracking system. As demonstrated in Plates 1 to 4 below, the South Keswick Solar Farm does not form a dominant feature of the landscape and is difficult to distinguish beyond 1km.



**Plate 1:** View of the South Keswick Solar Farm from less than 250m at similar elevation. Image orientation south-west, captured at 12.42pm 22/02/2021.





**Plate 2:** View of the South Keswick Solar Farm from approximately 1km at similar elevation. Image orientation north-west, captured at 11.28am 22/02/2021.



**Plate 3:** View of the South Keswick Solar Farm from approximately 1.8km at similar elevation. Image orientation north-west, captured at 11.40am 22/02/2021.





**Plate 4:** View of the South Keswick Solar Farm from approximately 2.2km at increased elevation of approximately 40m. Image orientation north-west, captured at 12.19pm 22/02/2021.

### 5.3.3 Potential residential visual receptors

Eight (8) potential residential visual receptors identified within the ZTV of the Visual Catchments were identified as residents in their homes. As these areas are private property, the assessment undertaken on the site visit was restricted to the public spaces near the receptors, primarily the local roads. A degree of assumptions is therefore made with respect to potential levels of visibility from these receptors and are discussed in the assessment table (Table 5.3) below.

It is noted that in assessing the **sensitivity** of receptors, each of these potential receptors is automatically assigned a 'moderate' score for the 'value' in accordance with the results from the assessment of landscape receptors (Table 5.2), where the visual effects are not considered to compromise the specific basis for the value attached to the landscape character in this area.

It is further noted that in assessing the **magnitude** of effects, each of the potential receptors is automatically assigned a 'high' level of magnitude for:

- 'frequency of use', again this is because the potential receptors are identified as residents in their homes and are therefore likely to be in this area for extended periods of time; and
- 'duration' for each potential receptor, as the proposed development is expected to last over a generation (excess of 30 years).

Lastly, each of the potential receptors is automatically assigned a 'low' level of magnitude for 'reversibility' as the view can be returned to a similar visual state prior to introduction of the proposal upon decommissioning.

The visibility from the potential residential visual receptors is also depicted in Figure 5.2.



**Table 5.3:** Assessment of potential visual effects on potential visual receptors

		Sensitivity of Receptors	Magnitude of Effect						
Potential Visual Residential Receptor	Susceptibility	Value	Size & scale	Frequency of use	Distance/ Geographical extent	Duration	Reversibility	Description	Significance of Effect
1	H	M	L	H	L	H	L	The dwelling is surrounded by existing screening vegetation. Additionally, slight variations in landform to what is indicated from the DEM were identified during the site visit, lowering the visibility from this receptor. Any visibility of the proposal is considered to be predominantly of the proposed landscape screening, not the solar panels. Additionally, only the top most of the battery storage containers/inverters may be visible. Overall, due to their scale and nature, these elements will not form a dominant or significant feature in the landscape.	Low
2	H	M	L	H	M	H	L	As above.	Low
3	H	M	M	H	M	H	L	The owner/occupier of this dwelling is the landowner of the proposed development site. The proposal is obscured from view from the dwelling owing to existing vegetation screening and a number of structures. The proposal will not form a dominant or significant feature in the landscape from this dwelling.	Low
4	H	M	L	H	L	H	L	A combination of existing vegetation screening and slight undulations in the terrain provide for reduced visibility of the proposal from this potential receptor. Further, this visual receptor is situated in excess of 1km from the proposal. As demonstrated in Plates 2 and 3, any visibility of the proposal would be difficult to distinguish within the landscape. The proposal will not form a dominant or significant feature in the landscape from this dwelling.	Low
5	H	M	L	H	L	H	L	As above.	Low
6	H	M	L	H	L	H	L	As above.	Low
7	H	M	L	H	L	H	L	As above. Additionally, these receptors are situated proximate to the South Keswick Solar Farm, which will obscure any views of the proposal.	Low
8	H	M	L	H	L	H	L	As above.	Low

#### 5.3.4 Other potential visual receptors

In this instance, the other potential visual receptors predominantly refer to road users within the vicinity of the proposal. Wellington Road, also indicated as the Mitchell Highway, is a State classified road and experiences high frequency use. The proposal is not assessed as being visible from this road. This is primarily due to slight variations in terrain from that indicated in the DEM and the speed of which users are travelling (100km per hour) so that the proposal (if visible) would only be viewed for a brief moment. Additionally, any potential views would likely only be viewed by those travelling southbound due to the orientation of the road. However, existing vegetation, buildings and structures scattered throughout the allotments between the road and the proposal acts as additional screening, so that any views of the proposal would be partial only. In accordance with Table 2.2, the sensitivity of these potential visual receptors is considered low. Further, despite the frequency of use, the magnitude of the effect is considered to be overall low due to the size/scale, distance, and reversibility of the proposal as well as the short duration of any visibility that would occur. As such, the overall significance of the effect is considered low from this road as there is no change to the landscape in this instance.

Basalt Road is situated nearest the proposal; however, this road experiences infrequent use as it is primarily used to provide access to the three (3) properties along the road and does not provide a link to other roads. The highest visibility (as shown in the ZTV Analysis and confirmed on ground) is expected along the unsealed portion of this road (to the south), which is the least frequented. The sensitivity of these potential visual receptors is therefore also considered low. Further, despite the distance, the magnitude of the effect is also considered to be overall low due to the frequency of use, size/scale and reversibility of the proposal. Again, potential receptors from this road would experience a short duration of visibility only. As such, the overall significance of the effect is considered low from this road as there is no change to the landscape in this instance.

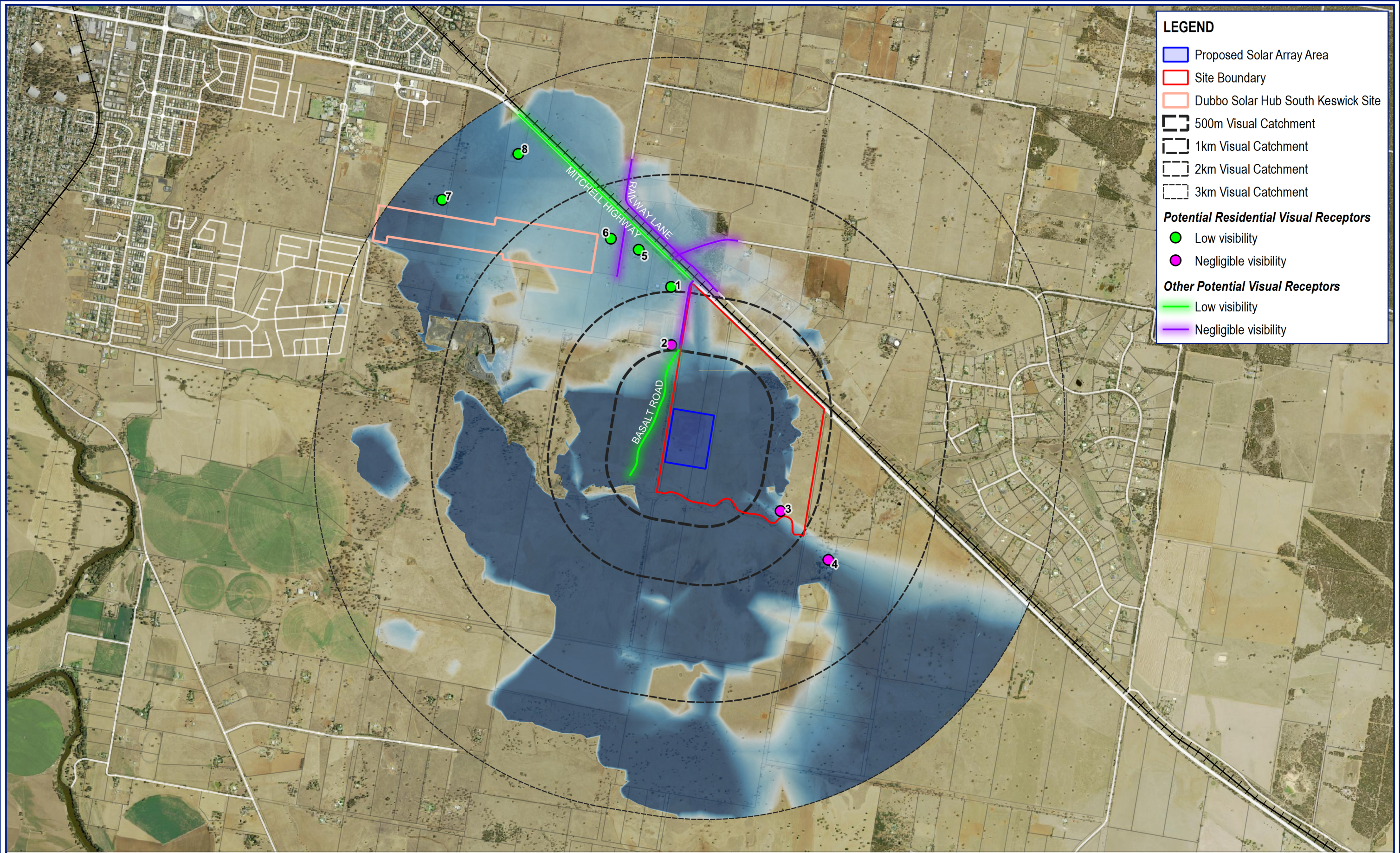
Similar to Basalt Road, Lidscomb Road also experiences infrequent use as it is primarily used to provide access to the three (3) properties along the road and does not provide a link to other roads. The proposal site was not determined to be visible from this road; therefore, the significance of the effect is considered low as there is no change to the landscape in this instance.

A small portion of Eulomogo Road on the northern side of the Mitchell Highway is identified within the ZTV Analysis as having a small degree of visibility. This area was also assessed during the site visit and found that a considerable amount of existing vegetation provides natural screening of the proposal from this location. The proposal is not visible from this road; therefore, the significance of the effect is considered low as there is no change to the landscape in this instance.

Lastly, a small portion of Railway Lane is also identified within the ZTV Analysis as having a small degree of visibility. This section of Railway Lane experiences infrequent use and potential visibility from travellers would be from those travelling southbound. Notwithstanding, this area also has a combination of slight variations in the terrain from that indicated in the DEM and there is a substantial amount of scattered vegetation on the southern side of the Mitchell Highway, particularly along the frontage of Lots 27-29 in DP247415 that obscure visibility of the proposal from this road. The proposal is not deemed to be visible from this road; therefore, the significance of the effect is considered low as there is no change to the landscape in this instance.

The visibility from the other potential visual receptors is also depicted in Figure 5.2.





**LEGEND**

Proposed Solar Array Area

Site Boundary

Dubbo Solar Hub South Keswick Site

500m Visual Catchment

1km Visual Catchment

2km Visual Catchment

3km Visual Catchment

**Potential Residential Visual Receptors**

Low visibility

Negligible visibility

**Other Potential Visual Receptors**

Low visibility

Negligible visibility

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FIGURE 5.2  
**VISIBILITY ANALYSIS**  
  
 0 0.5 1 1.5 2 2.5 3 km  
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## 6 SUMMARY AND RECOMMENDATIONS

### 6.1 LANDSCAPE AND VISUAL RECEPTORS

As discussed in Sections 3 and 5, the proposal is considered to have an overall **low** visual impact on landscape receptors including landform/ topography, landcover/ vegetation, land use, texture and colour, settlement and human influence, and rarity.

Further, as discussed in Section 5.3, the proposal will have an overall **low** visual impact on both potential residential visual receptors and other potential visual receptors.

This low-level impact is primarily achieved due to the scale and nature of the proposal, which is sympathetic to the existing character, difficult to discern from within the landscape as a whole, and does not compromise the character of the landscape within the site or surrounding area.

### 6.2 CUMULATIVE AND RESIDUAL IMPACTS

Cumulative landscape and visual effects are the combined visual changes (both positive and negative) caused by a proposed development in conjunction with other similar developments. It is also important to consider both the existing and evolving contextual landscape in the region. As stated, landscapes are not static but continue to evolve and change with communities. Landscape changes are driven by changing requirements for development to meet the needs of a growing population, which includes a variety of forms of alternative energy generation technologies.

Rural landscapes have historically been the preferred location for electrical infrastructure, including substations and high voltage overhead transmission lines. As noted within this LVIA, the South Keswick Solar Farm is proximate to the proposal and is therefore the key development in considering cumulative visual impacts. Importantly, it is not considered that either the above-mentioned solar farm or the proposal will be able to be viewed together from a single viewpoint within the landscape. These can therefore be considered stand-alone visual elements within the landscape and no cumulative visual impacts are envisaged to ensue.

As such, no additional mitigation measures are deemed necessary for the proposal. Subsequently, no residual visual impacts are identified or required to be assessed.

### 6.3 CONCLUSION

This LVIA is intended to provide an assessment of the existing landscape character within the geographical context of the proposal. It has been noted that the assessment of visual impact is subjective, and the individual consideration of qualitative factors such as scenic quality may differ between receptors as it is influenced by individual values, preferences and affiliations with the landscape and particular views.

The existing landscape and scenic quality of the Visual Catchments indicates that the site is appropriate for the proposal as it is considered to be:

- Sympathetic to the existing development within the site and surrounding landscape in terms of bulk and scale, and presents harmoniously in views from visual receptors;
- Will not be a dominant feature in the landscape or change the landscape character; and
- Will not pose a significant adverse visual impact to potential receptors.

The assessments provided in this report concluded:

- The landscape within and surrounding the site can be described predominantly rural, typified by gradually undulating terrain with scattered vegetation and the land utilised primarily for agricultural purposes;
- Electrical infrastructure, including renewable energy infrastructure and ancillary structures are common within rural landscapes.
- The significance of landscape effects on potential landscape receptors is categorised as **low**.
- The significance of visual effects on potential visual receptors is categorised as **low**.

Combined, these assessments form the basis to evaluate the magnitude and significance of the visual impact on the landscape and locality resulting from the proposed development, which is **low** overall.

## 7 REFERENCES

Australian Institute of Landscape Architects. (2018). *Guidance Note for Landscape and Visual Assessment*. June 2018.

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Department for Finance, Services & Innovation. (2015). *Elevation Data Products Specification and Description*. Spatial Services. New South Wales Government. ISSN: 2205-0191.

Landscape Institute and Institute of Environmental Management & Assessment. (2013). *Guidelines for Landscape and Visual Impact Assessment*. (3rd ed.). ISBN: 978-0-203-43629-5

Roads and Maritime Service. (2013). *Environmental Impact Assessment Practice Note: Guidelines for Landscape Character and Visual Impact Assessment*. Guideline No. 4. New South Wales Government.



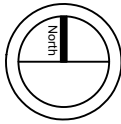
## APPENDICES





## APPENDIX 1

Project Design Plans prepared by ACEnergy

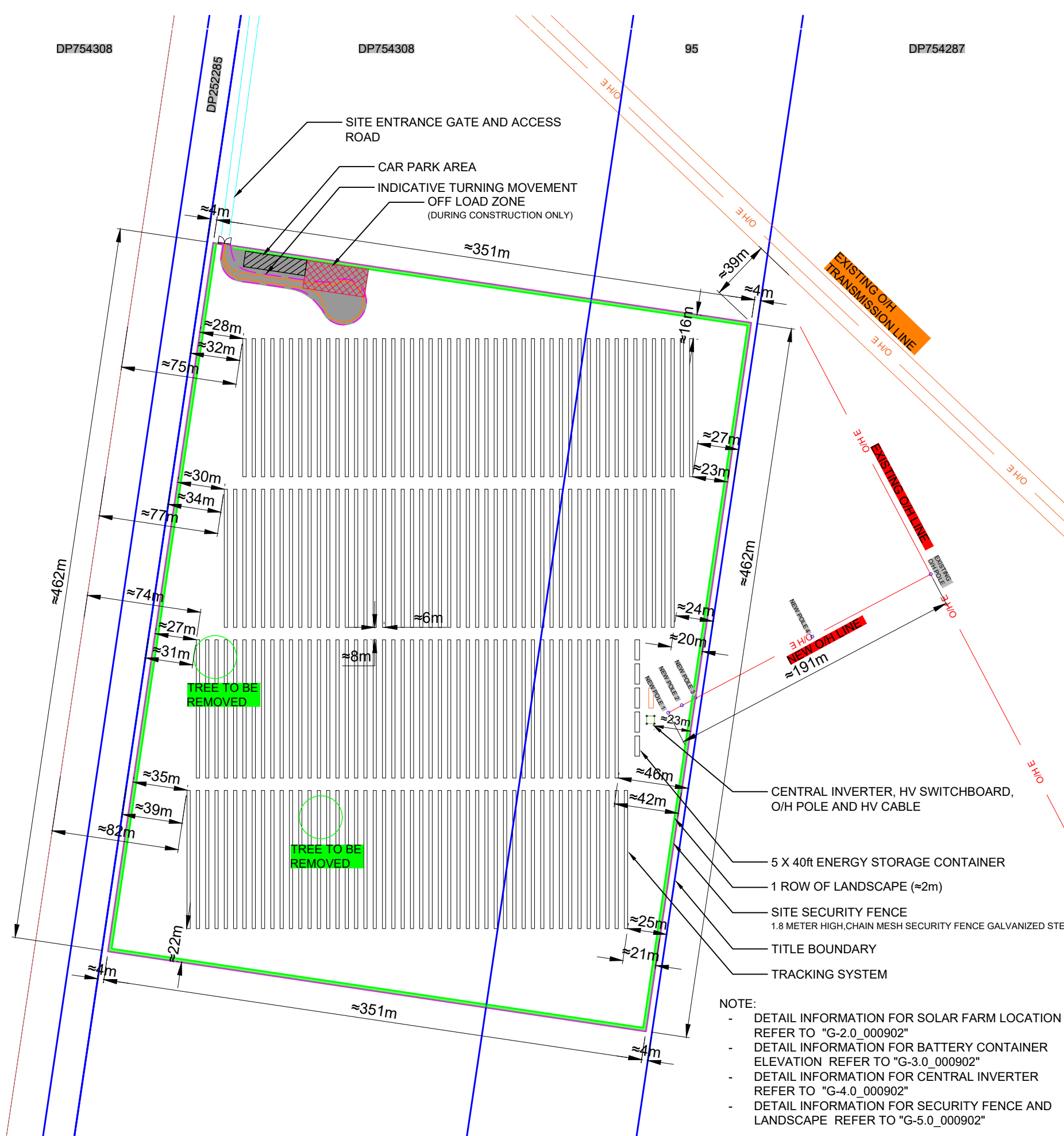


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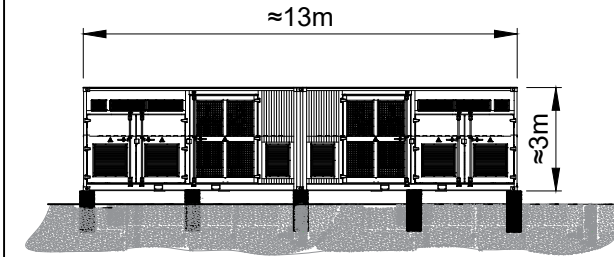
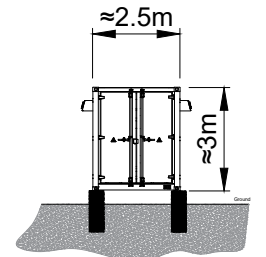
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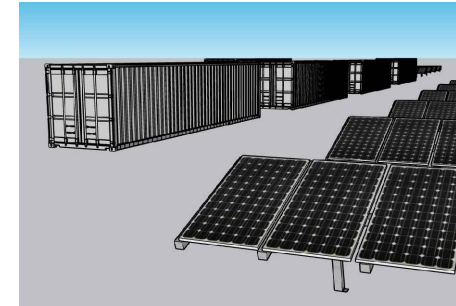
## TYPICAL CENTRAL INVERTER LAYOUT

FRONT VIEW  
SCALE 1:100SIDE VIEW  
SCALE 1:100BOTTOM VIEW  
SCALE 1:100

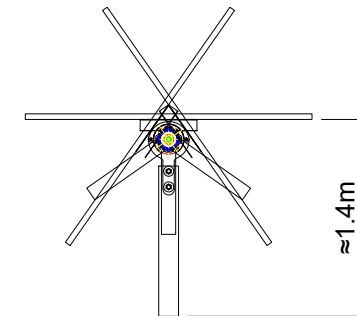
## TYPICAL CENTRAL INVERTER

GREY COLOR  
POWDER COATED STEEL

## TYPICAL BATTERY CONTAINER LAYOUT

TYPICAL DC COUPLED ENERGY  
STORAGE CONTAINER  
40ft CONTAINERGREY COLOR  
POWDER COATED STEEL

## TYPICAL TRACKER LAYOUT



## TYPICAL TRACKING SYSTEM



## LEGEND

	SITE ACCESS GATE AND ROAD		SOLAR FARM FENCE 1.8 METER HIGH CHAIN MESH SECURITY FENCE GALVANISED STEEL		POWERCOR HV CABLE
	SITE CAR PARK ZONE		PV TRACKER (~2m X 89m)		1 ROW OF LANDSCAPE
	SITE CONSTRUCTION OFFLOAD ZONE		ROAD / HIGHWAY / RAILWAY		CENTRAL INVERTER
	HV O/H POLE / HV UG/OH POLE		TITLE BOUNDARY		DC COUPLED ENERGY STORAGE CONTAINER X 5 10MWh, 40ft
	HV SWITCHBOARD PLATFORM		NEIGHBOURING'S BOUNDARY		

## NOTE:

- DETAIL INFORMATION FOR SOLAR FARM LOCATION REFER TO "G-2.0\_000902"
- DETAIL INFORMATION FOR BATTERY CONTAINER ELEVATION REFER TO "G-3.0\_000902"
- DETAIL INFORMATION FOR CENTRAL INVERTER REFER TO "G-4.0\_000902"
- DETAIL INFORMATION FOR SECURITY FENCE AND LANDSCAPE REFER TO "G-5.0\_000902"

## REVISIONS

REV	STATUS	DESCRIPTION	DATE	D.B.	C.B.
A	FA	SITE PLAN	08/02/21	XT	RZ

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## DUBBO SOLAR FARM

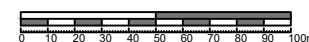
47R WELLINGTON ROAD DUBBO  
-32.287786, 148.671132

## CLIENT DETAILS:

## ACENERGY PTY LTD

## DRAWING TITLE:

## SITE PLAN



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## DRAWING NR:

G-1.0\_000902

## DRAWN BY :

XT

## APPROVED BY :

RZ

## PROJECT MGR :

LZ

## SCALE :

AS INDICATED

## ISSUE :

FOR APPROVAL

## ISSUE DATE :

08/02/2021

## SHEET SIZE:

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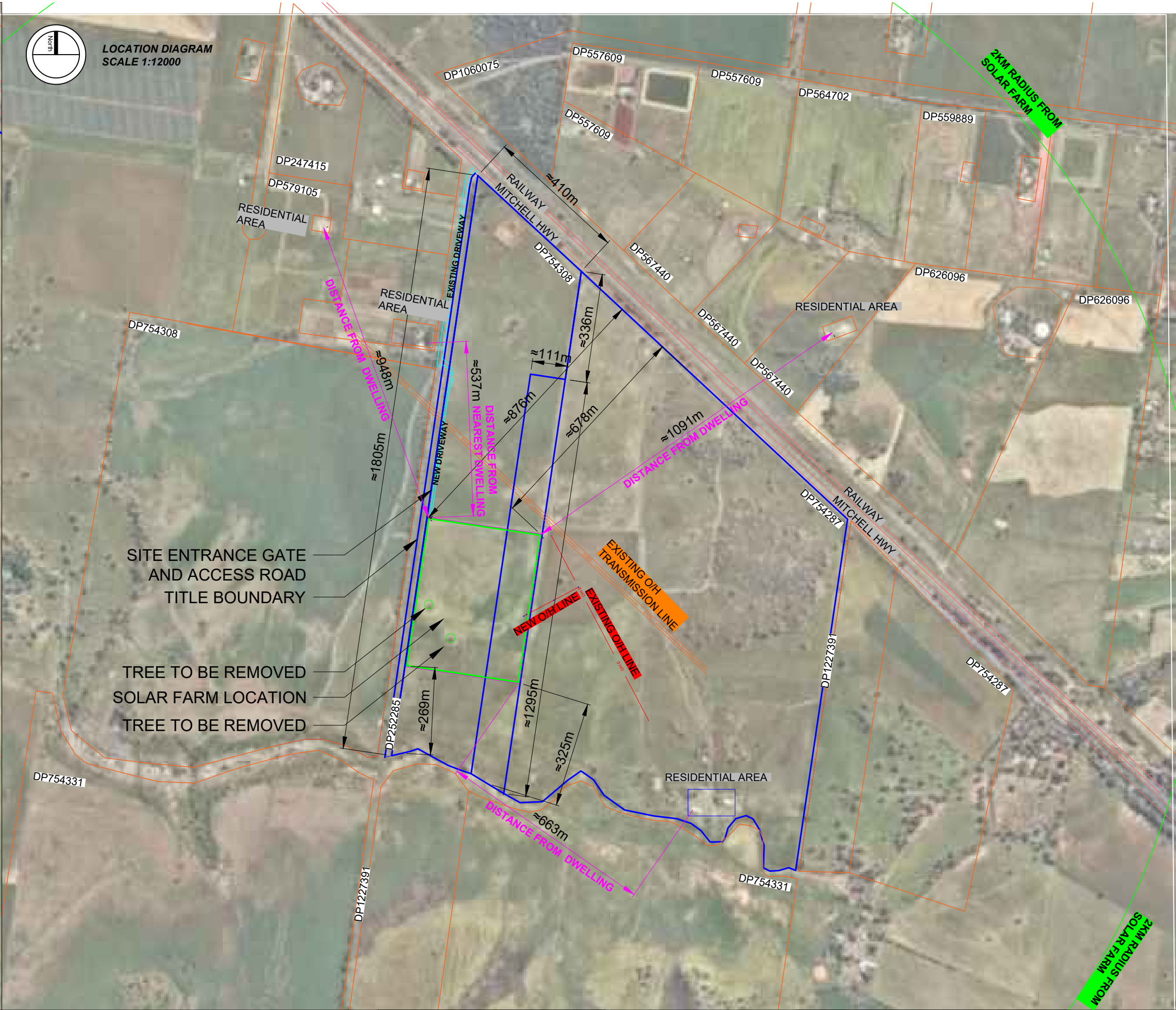
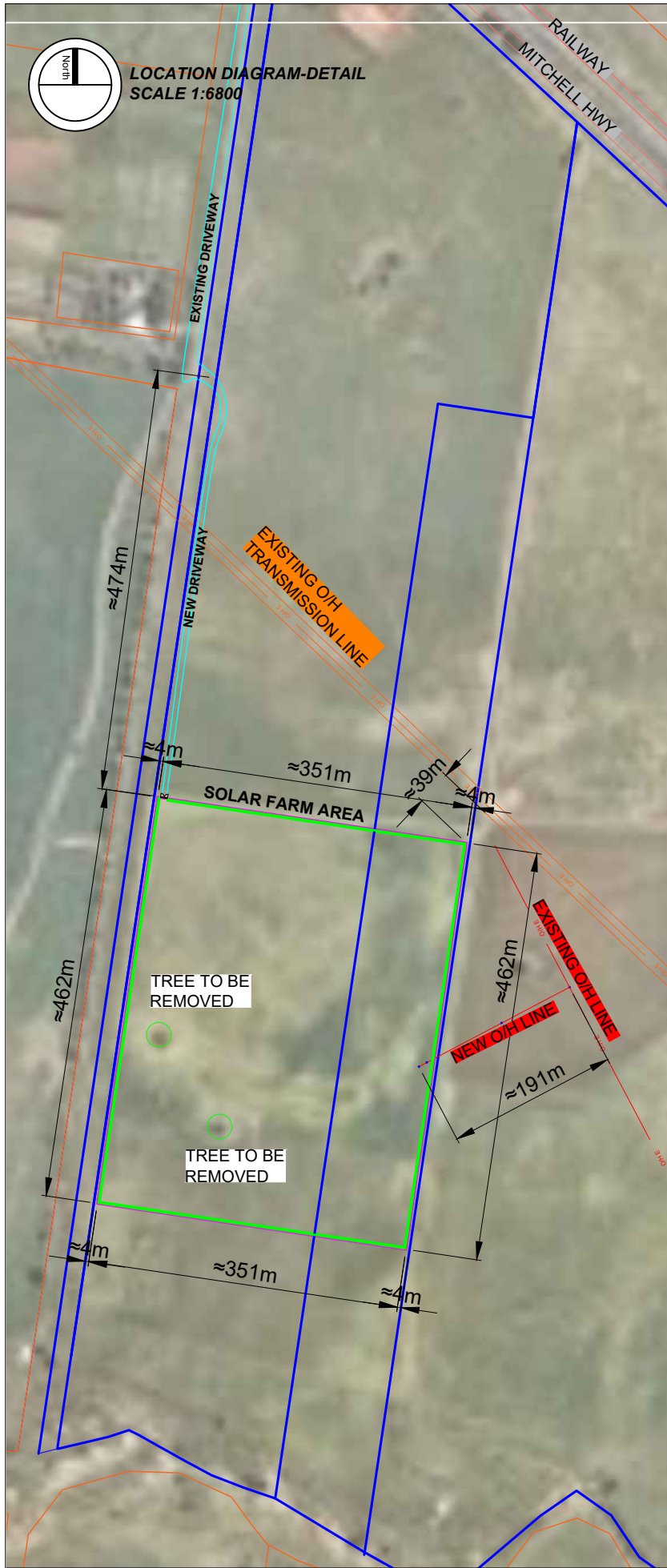
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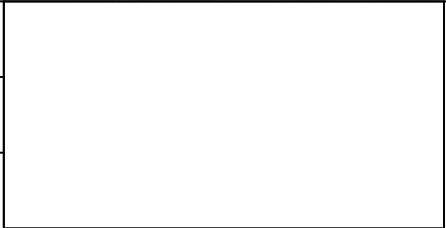






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CLIENT DETAILS:	ACENERGY PTY LTD
DRAWING TITLE:	LOCATION DIAGRAM

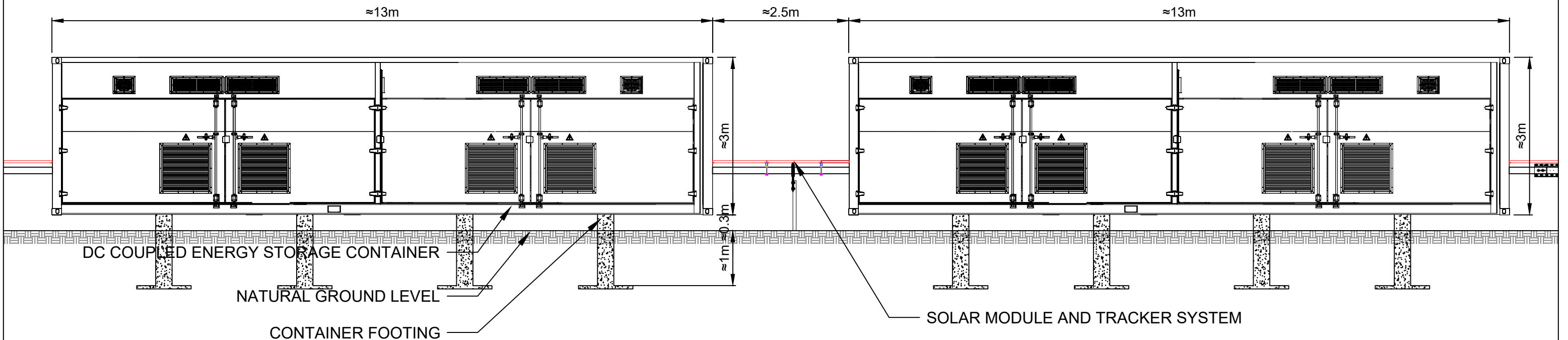


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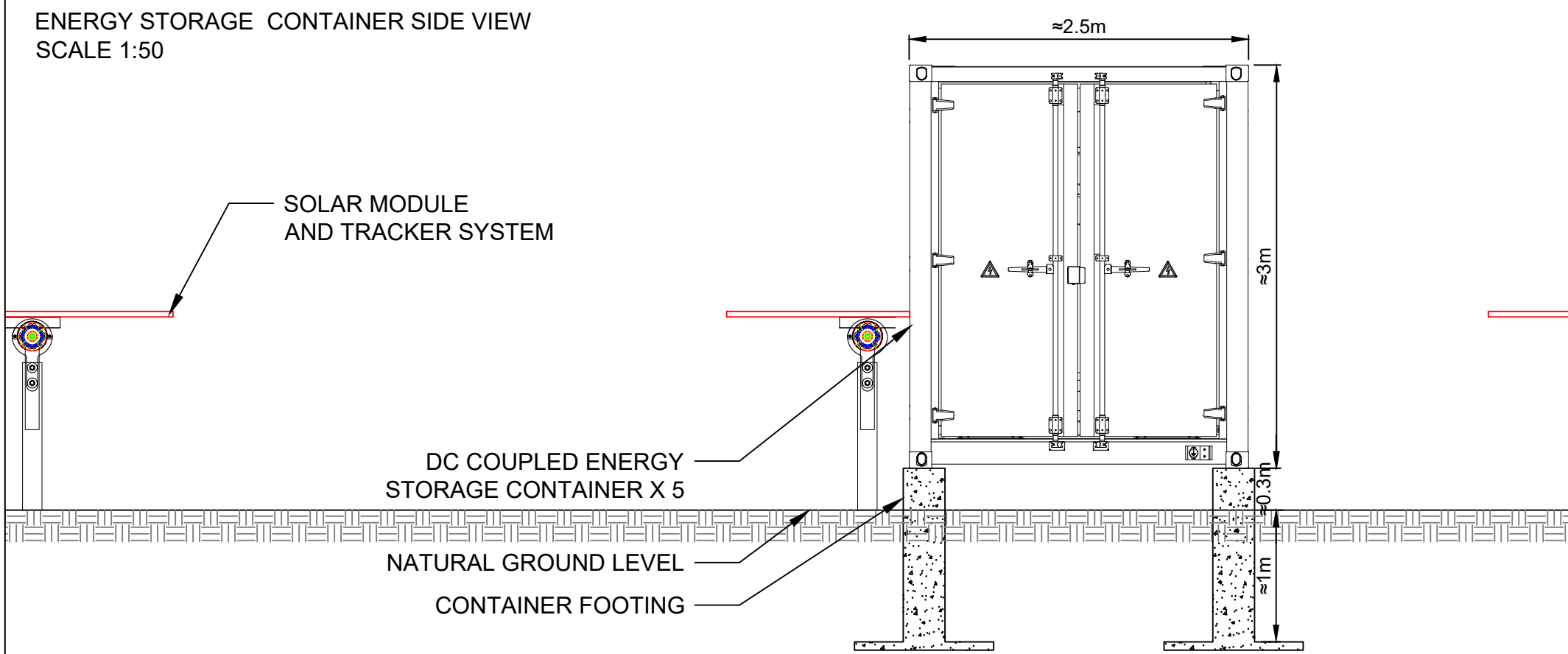
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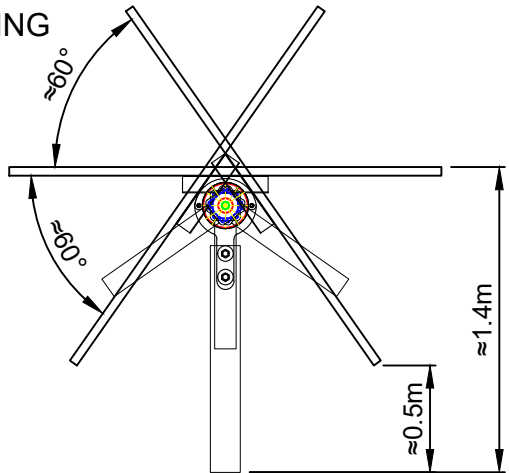
ENERGY STORAGE CONTAINER FRONT VIEW  
SCALE 1:70



ENERGY STORAGE CONTAINER SIDE VIEW  
SCALE 1:50



TYPICAL TRACKING SYSTEM



TYPICAL DC COUPLED ENERGY STORAGE CONTAINER



REVISIONS					
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A	FA	FOR INITIAL ISSUE	8/02/2021	XT	RZ

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CLIENT DETAILS:	ACENERGY PTY LTD
DRAWING TITLE:	DC COUPLED ENERGY STORAGE CONTAINER ELEVATIONS


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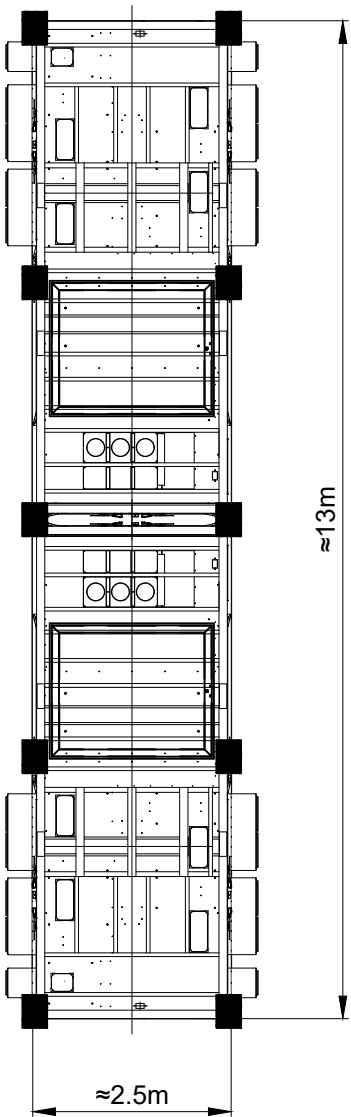
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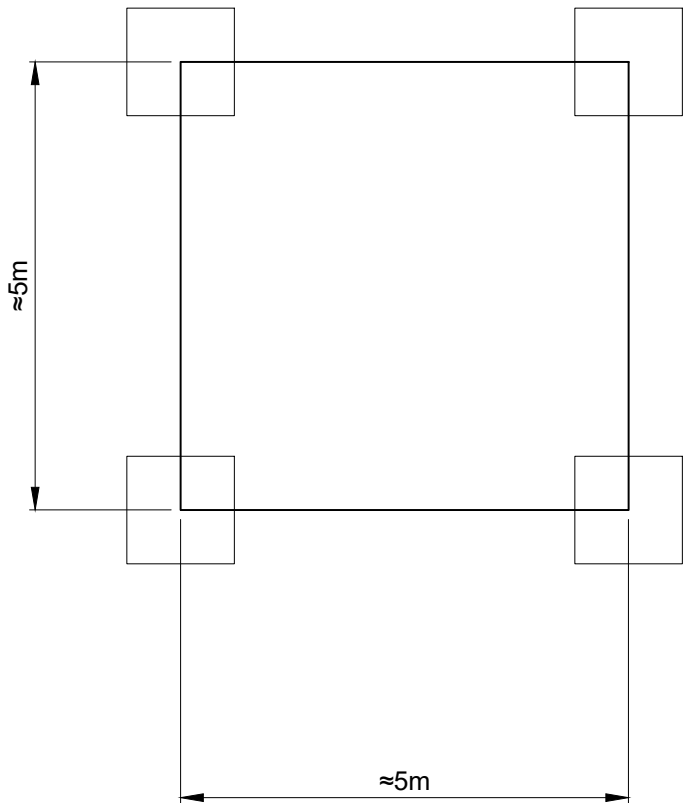


CENTRAL INVERTER, HV SWITCHBOARD AND UG/OH POLE TOP VIEW  
(RELATIVE LOCATION REFER TO "G-1.0\_000901\_SITE PLAN")

CENTRAL  
INVERTER



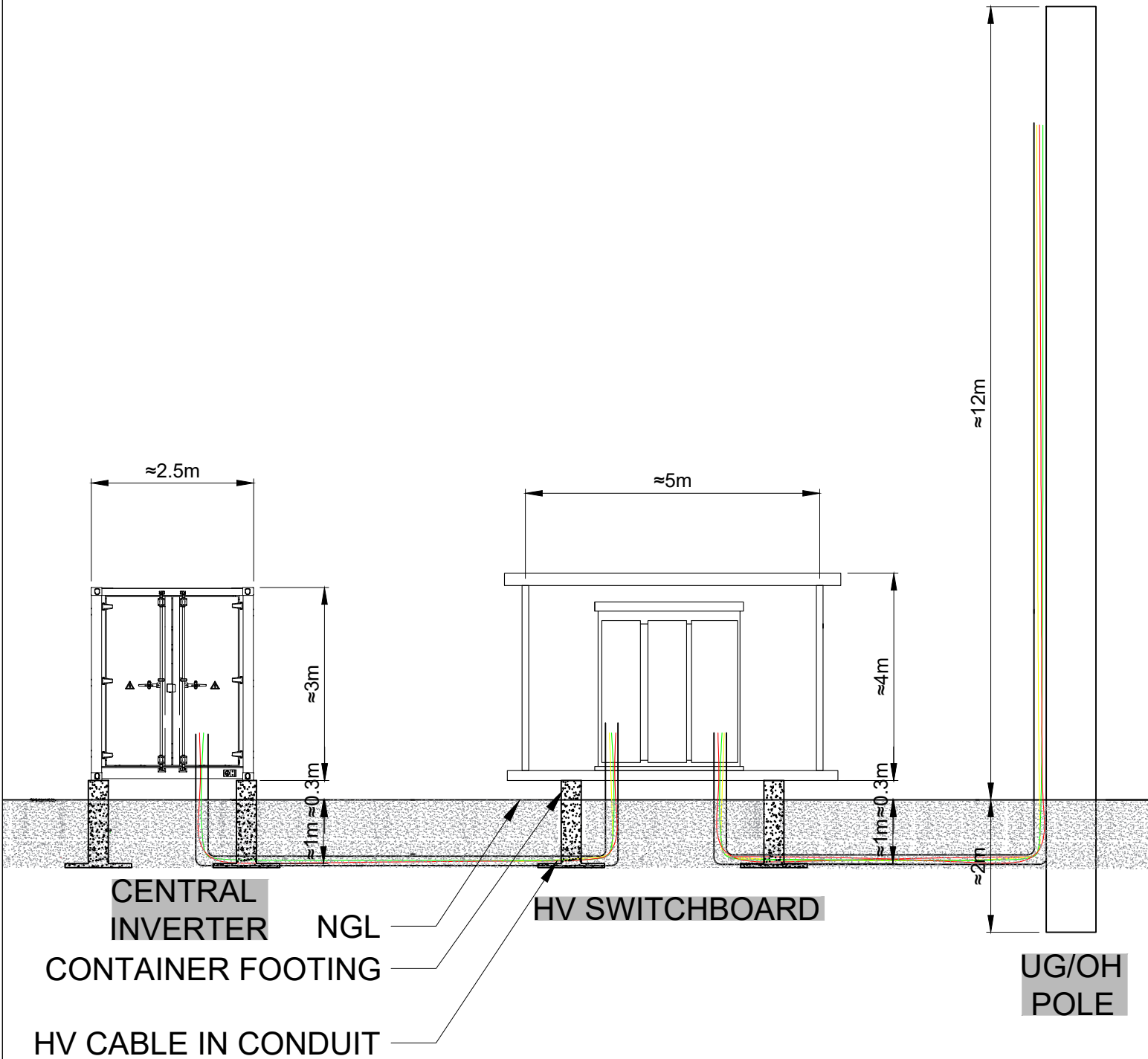
HV SWITCHBOARD  
PLATFORM



UG/OH  
POLE



CENTRAL INVERTER, HV SWITCHBOARD AND UG/OH POLE SIDE VIEW  
(RELATIVE LOCATION REFER TO "G-1.0\_000901\_SITE PLAN")



REVISIONS					
REV	STATUS	DESCRIPTION	DATE	D.B.	C.B.
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CLIENT DETAILS:	ACENERGY PTY LTD
DRAWING TITLE:	CENTRAL INVERTER, HV SWITCHBOARD, O/H POLE ELEVATION

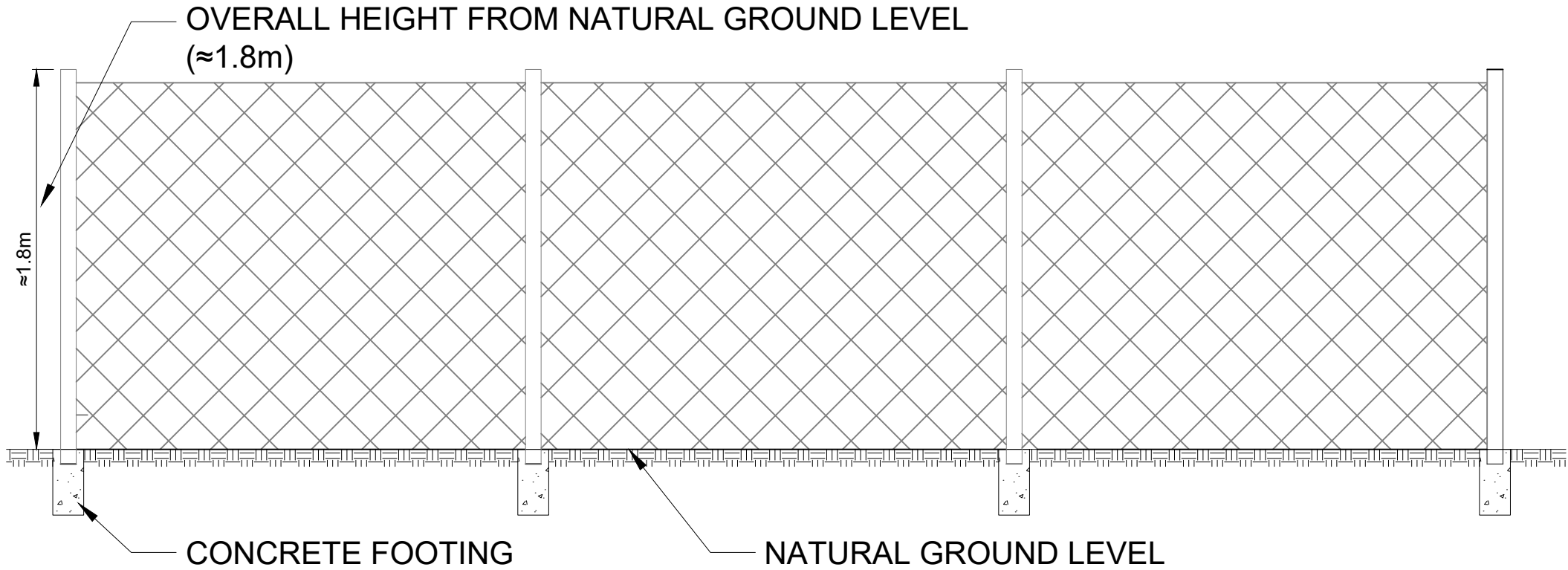
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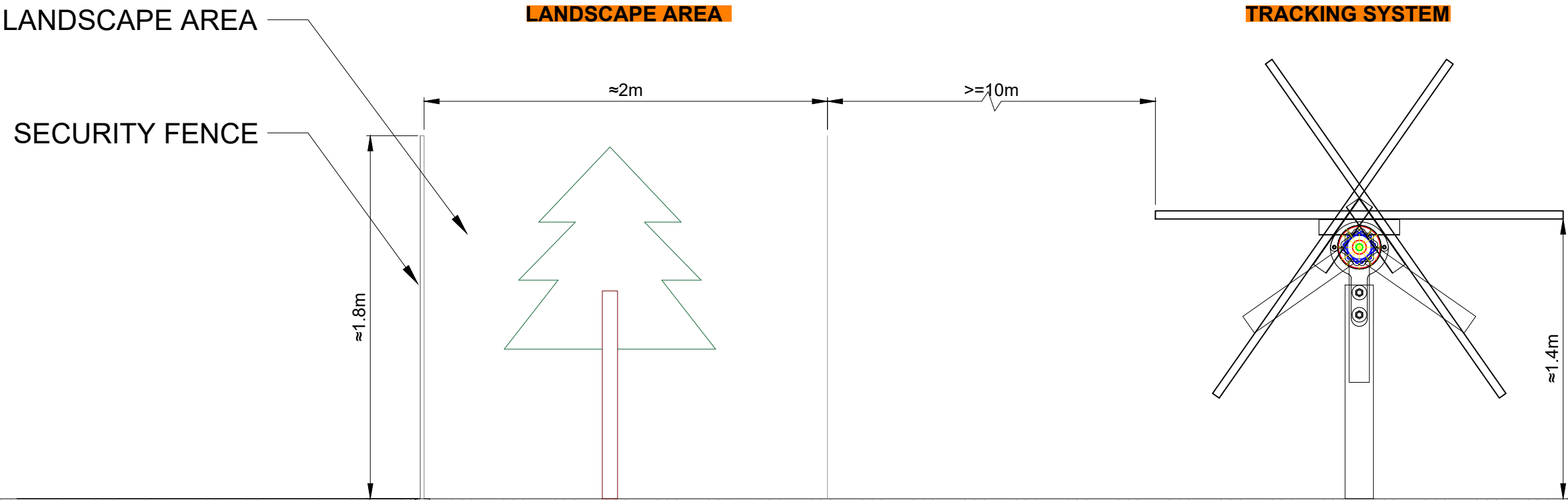
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SECURITY FENCE FRONT VIEW  
SCALE 1:2.5



SECURITY FENCE, LANDSCAPE AND TRACKING SYSTEM SECTION VIEW  
SCALE 1:25



REVISIONS					
REV	STATUS	DESCRIPTION	DATE	D.B.	C.B.
A	FA	INITIAL ISSUE	08/02/21	XT	RZ

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CLIENT DETAILS:	ACENERGY PTY LTD
DRAWING TITLE:	SECURITY FENCE DETAILS

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