AMAROO SOLAR FARM

Visual Analysis and Landscape Concept

Prepared for:

Providence Asset Group

704/99 Bathurst Street, SYDNEY NSW 2000

SLR Ref: 631.30013 Version No: - v1.0 MAY 2021

PROJECT NAME

Location	Lot 392, DP751780 Amaroo Drive, Moree NSW 2400
Project Number	631.30013.00000
Client	Providence Asset Group

PREPARED BY

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Reference	Date	Prepared	Checked	Authorised
631.30013.00000- v0.1	March 2021	Dallas Ellis	Dean Butcher	Dean Butcher
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631.30013.00000- v1.0	May 2021	Dallas Ellis	Dean Butcher	Dean Butcher

CONTENTS

1. INTRODUCTION

1.1 Background

This Visual Analysis has been prepared for the proposed Solar Farm near Moree, NSW.

This visual analysis assessment has been prepared to provide an effective and objective assessment of the anticipated high level impacts of the project on the surrounding visual environment.

SLR has worked closely with other members of the project team in determining and rating visual impacts of the proposed Solar Farm project works on its immediate surrounds as well as suggesting mitigation measures to further reduce any impacts that may occur.

There are 2 parts to this report

- Visual Analysis and
- Landscape Concept.

1.2 Site Location

The land on which the proposed Solar Farm (the project) shall be located (the subject site) is situated approximately 2km south west of the Moree town centre on the outskirts of the town.

The site is located to the west of Birrawee Place and accessed via Amaroo Drive. The proposed development will consist of solar panels mounted on single-axis trackers connected to a power conversion station with an access and hardstand area from the existing track adjacent to the railway line. The development will be confined to Lot 392, DP751780 (**Figure 1**).

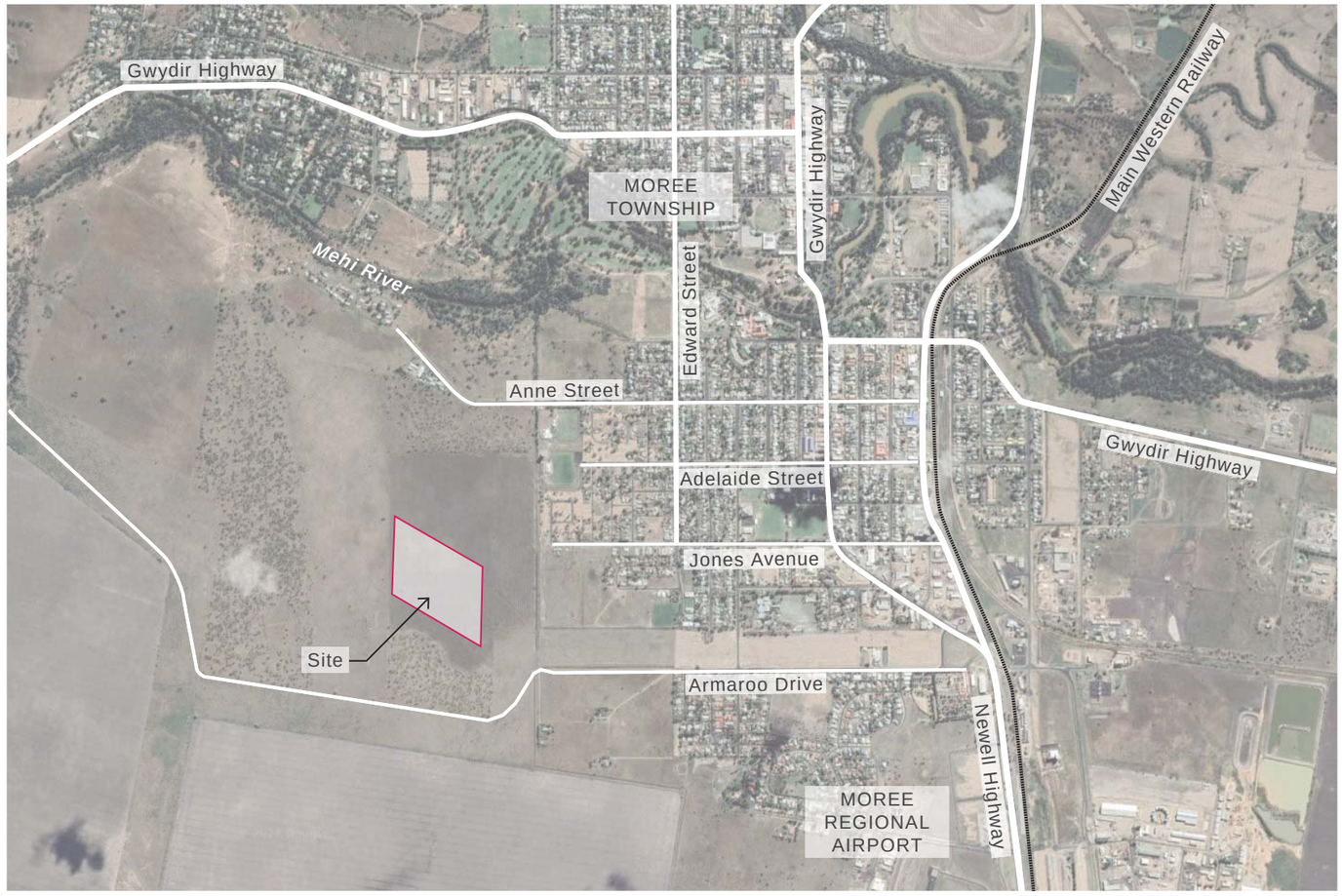


Figure 1. Locality Plan

2. BASELINE VISUAL ENVIRONMENT

2.1 Subject Site and Surrounding Context

The site is located to the west of Birrawee Place and accessed via Amaroo Drive. The site, like its surrounding context is typically flat with the Mehi River to the north. The subject site is surrounded by stands of vegetation, and low density residential housing on the outskirts of Moree.

2.1.2 Roads and Access

The subject site does not directly front either the Narrabri Road or the Gwydir Highway which are State Roads traveling through Moree. There are a number of local residential and rural roads that are located adjacent to the site and have open views of it. Jones Avenue, Birawee Place and Amaroo Drive are the closest local roads and the latter is the proposed access to the site.

2.1.3 Vegetation

The subject site has been cleared of vegetation except for a few scattered remaining specimens which are located on the southern boundary of the proposed Solar Farm.

Although the site and the residential areas adjoining it are sparsely vegetated, there are local stands of existing vegetation to the north, south and west of the site that visually frame the rural property and enclose the local viewshed. These vegetated areas have medium to large trees and provide a more natural appearance to the rural and urban setting.

Vegetation along the Mehi River is well established and views of the site are not visible from the banks of the river.

2.1.4 Structures

There are no structures on the subject site. There are a number of rural residential dwellings in the surrounding area to the east of the site and low density detached residential dwellings on the edge of Moree.

A number of agricultural structures are present in the surrounding area, the closest being approximately 600m to the northeast of the site.

2.1.5 Infrastructure

The subject site has power poles and lines running past it on the southern and western sides. No other infrastructure exists within the proposed Solar Farm site.

3. LANDSCAPE CHARACTER ANALYSIS

3.1 Regional Context

The landscape character of the region surrounding the site is flat, open rural lands used with a mix of pastoral and agricultural uses. Whilst the vegetation is sparse on the agricultural lands, it is typically concentrated around the local waterways (Mehi River). This however is generally not within the local visual context of the site.

3.2 Baseline Visual Character of Subject Site and Surrounds

The subject site is typical of the rural landscape character of the region in that it is open and typically devoid of tree and vegetation cover. As the size of the site is small in the context of its surrounds, it utilises the 'borrowed landscape' of the adjoining vegetation stands to define its visual context and local views.

4. PROPOSAL

4.1 Project Description

A full description of the proposal is provided within the main Statement of Environmental Effects and site plans, but a brief description is as follows.

Section 4.1.1 identifies key elements of the proposal that are of particular relevance to an assessment of impacts on the visual analysis.

4.1.1 Indicative project Layout

The solar electricity generating facility will consist of the following elements:

- Solar array area of approximately 10.3 hectares within a total fenced area of approximately 13.3 hectares
- Solar array mounted on trackers (161 sets)
  - Rectangular photovoltaic module
  - Trackers area horizontal single-axis type
  - Solar array up to 2.6m high with +/-60° rotation angle
  - Trackers orientated north - south
- Associated infrastructure
  - Power Conversion Station (PCS)
  - Entry to the site via improved access from the Amaroo Drive
  - Security fencing
  - Car park area
  - Offload and hardstand area

During construction, temporary facilities located within the site may include:

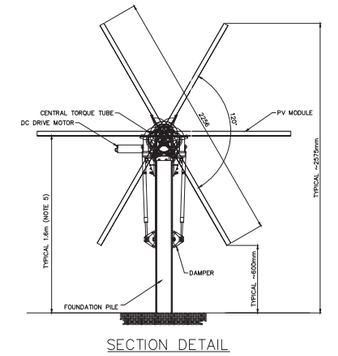
- Construction office

4.1.2 Solar panel dimensions and arrangement

The proposed solar array module dimensions are approximately 1.1 m wide x 2.3m long. They are mounted on a tracking system that will maximise the electricity production. The tracking systems will be arranged in rows running in a north-south axis to follow the sun with the aim of orienting each panel to be as close to perpendicular as possible to the incoming sun.

The tracking systems will be arranged in rows running in a north-south direction as indicated in **Figure 2**.

The diagram in **Figure 2.1** illustrates the dimensions and rotation of the panels. The panels only rotate from east to west and are not tilted toward the north.



SECTION DETAIL

Figure 2.1 Solar panel / tracking system

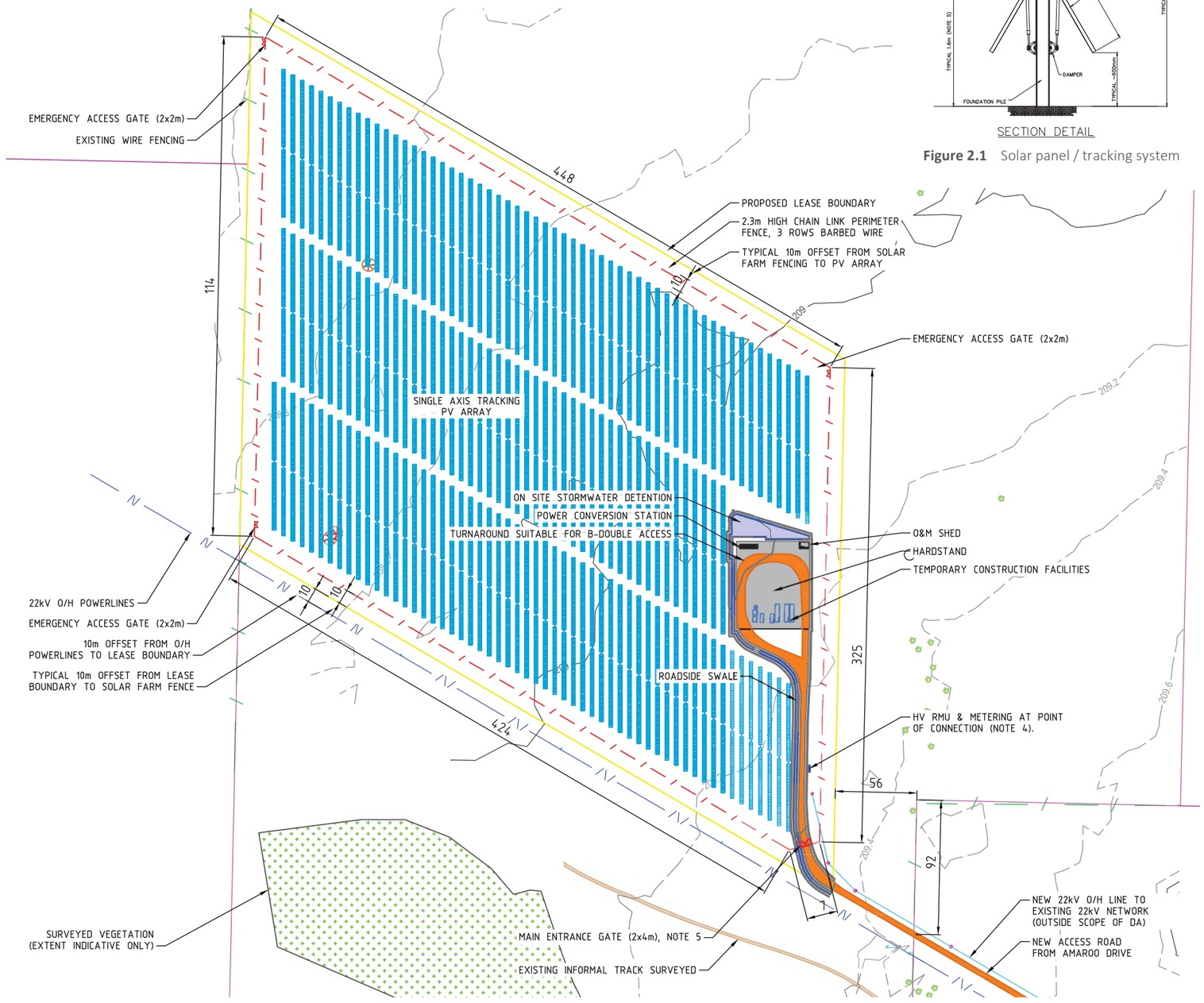


Figure 2. Concept layout of the project

5. VISUAL IMPACT ASSESSMENT

5.1 Process

The Visual Impact Analysis generally applies the assessment techniques set out in the 'Guidelines for Landscape and Visual Impact Assessment, Third Edition' (2013) prepared by The Landscape Institute and the Institute for Environmental Management and Assessment (UK).

The analysis includes the following:

- Review of the proposal (scale, bulk, height, technical specifications and landscape);
- Analysis of the subject site (visual exposure, visual qualities and landscape values);
- Identification of potential impacts on key receptors including the rating of magnitude for each receptor group;
- Rating of impact significance for each receptor group;
- The significance is evaluated as a product of the sensitivity or value of the receptor, and the magnitude of impacts on the receptor;
- Potential mitigation measures to meet the necessary planning requirements and any community expectations;
- The report included a desktop analysis and a visual site investigation in March 2021. The desktop review included the review of aerial photography, site topography and vegetation cover.

Photo-montages were also prepared to inform the analysis.

5.2 Assessment of Visual Impacts for Key Receptors

Photographic imagery was taken of the site to assist in the assessment of visual impacts. Photos were taken with a Canon EOS 6D Mark II digital single-lens reflex (DSLR) camera with a 50 mm lens.

Five photomontage images were prepared to assist in the Visual Analysis process; all from public receptor points.

The five receptors used in the photomontage were selected to investigate a range of visual solutions and illustrating views from areas of perceived sensitivity. During the site investigation, local areas around the site were observed to determine the potential visibility of the proposed Solar Farm.

For the purposes of this Visual Analysis a Photomontage image was produced from each of the five viewpoints chosen. The approximate extent of the proposed Solar Farm has been identified to give a general impression of the location on site and the approximate height.

The Photo montage Images are represented in Section 5.8 and show the following overlays of information.

- Existing visual baseline (existing landform);
- Overlay of the final Solar Farm proposed development.

5.3 Receptor Sensitivity

The receptor sensitivity is derived from a combination of factors including:

- Receptors interest in the visual environment (high, medium or low interest in their everyday visual environment and the duration of the effect);
- Receptors viewing opportunity (prolonged, regular viewing opportunities); and
- Number of viewers and their distance/ angle of view from the source of the effect, extent of screening/ filtering of view.

Whilst the assessment of visual values and effects is largely measured on a qualitative basis, assessment against scale enables a more objective evaluation and comparison of sensitivity of receptors and magnitude of effects. The Receptor Sensitivity Rating is described as being High, Medium, Low or Negligible as described in **Table 1.**

5.4 Magnitude of Landscape Change

The Magnitude of Change to the landscape character depends on the nature, scale, intensity, extent and duration of the impacts/ change attributable to the proposal. The magnitude of change also depends on the loss, change or addition of any feature to the existing landscape and is based on the character type that is most likely to be impacted by the project prior to the addition of any mitigation measures.

The Magnitude of Change is described as being High, Medium, Low or Negligible as described in **Table 2**.

Descriptions of Magnitude and Sensitivity are illustrative only and there is no defined boundary between levels of impacts.

Table 1. Receptor Sensitivity Rating

Receptor Sensitivity	Description
High	• Visitors to heritage sites, regionally important locations, scenic routes, lookouts within 2.5km with quality views, important views of the site and surrounding areas where landscape is the specific focus. • High numbers of visitors • Views to landscape that are rare and or unique and are possibly vulnerable to change • Views from residences within 1km of the site or are representative of high quality views
Medium	• Travellers/visitors along roads or rail routes that are not scenic routes but offer quality views within 2.5km of the site • Medium numbers of visitors/ residents (rural communities or townships) • Views that are representative of local character or sense of place but are not rare or unique • Views from residences beyond immediate vicinity (1km-5km) of the site or are representative of moderate quality views • Recreational users/ viewers beyond 2.5km from the site with moderate interest in their surrounds
Low	• Travellers/visitors along roads or rail routes that are not scenic routes but offer reasonable views within 4km of the site • People at place of work where setting or views not important to quality of working environment • Recreational users not dependent on views or scenic quality of landscape • View experience takes in broad context with which site is visible but not an important element. • Small numbers of visitors with passing interest in their surroundings (those travelling along mid-level roads) • Viewers whose interest is not specifically focused on landscape or scenic qualities (commuters, workers)
Negligible	• Very occasional or low level of users with passing interest in their surrounds (those travelling along minor roads or views from the air) • Travellers/visitors along unsealed roads offering views greater than 4km of the site

5.5 Impact of Significance on Landscape Character

The Impact Significance is evaluated according to 2 key criteria as noted above and is reflected in **Table 3.**

The rating is a means of comparing impacts on different receptors. Professional judgement and experience have been applied in order to identify the level of significance for each character type which has been assessed on its own merits.

- The sensitivity of the receptor or existing landscape; and
- The magnitude of the change or impact that is likely to occur.

The process of assessment and the use of the ratings tables reflect typical outcomes for visual impacts.

- Impacts on receptors that are particularly sensitive to change in views and visual amenity are more likely to be significant.
- Impacts that constitute a substantial change to the visual environment are likely to be more significant than the impacts that do not cause substantial change.

5.6 Summary of Potential Landscape Character Impacts

The following sheets summarise the assessment of impacts on each of the identified visual receptor groups.

Three representative viewpoints were identified where the site could be seen preferably from public locations. Due to the distances from the site, presence of topographic and vegetated features, surrounding structures and the limited views from publicly accessible areas, the choice of viable views was limited. The following sheets describe and rate the sensitivity of each viewpoint, the nature and magnitude of impacts likely to occur and the resultant significance of impacts for each receptor.

Typically views to the site from local roads and other public locations in the area were very limited. Photos from each receptor are provided and photomontages prepared to show how the proposed Solar Farm will be perceived from that particular viewpoint. Mitigation measures have been included where appropriate.

Table 2. Magnitude of Change

Magnitude of Change	Description
High	Dominant Change • Major change in view at close distances, affecting substantial part of the view continuously visible for a long duration or obstructing a substantial part or important elements of the view • Overwhelming loss or additional features in the view such as the nature of view or character of landscape fundamentally changed • Views to key landscape features affected • Visual amenity of local residents or road users substantially diminished • Substantial change to the landscape due to loss of and or change to elements, features or characteristics of the landscape creating an overall worsening of landscape quality
Medium	Considerable Change • Clearly perceptible changes in views at intermediate distances resulting in either distinct new element in a significant part of the view or a more widely ranging, less concentrated change across a wider area • Significant loss or addition of features in the view, such that nature of view or character of landscape is altered • Noticeable contrast of any new features in the view such that the nature of the view or landscape character is changed • Noticeable contrast of any new features or changes compared to existing landscape • Views to key landscapes partially obstructed but views remain intact
Low	Noticeable Change • Minor memorable change to the landscape or views • Temporary or reversible impact • Landscape dominant element and built form/ development well integrated within it • Little permanent change or no fundamental change to local landscape character
Negligible	Barely Perceptible Change • No memorable or rarely perceptible change to landscape character or key views

Table 3. Impact Significance Rating

Receptor Sensitivity	Magnitude of Change in Landscape				
	High (Dominant Change)	Medium (Considerable Change)	Low (Noticeable Change)	Negligible (Barely Perceptible Change)
High	High	Moderate-High	Moderate	Minor-Moderate
Medium	Moderate-High	High	Minor-Moderate	Minor
Low	Moderate	Minor-Moderate	Minor	Minor-Negligible
Negligible	Minor-Moderate	Minor	Minor-Negligible	Negligible

5.6.1 Selected Viewpoints

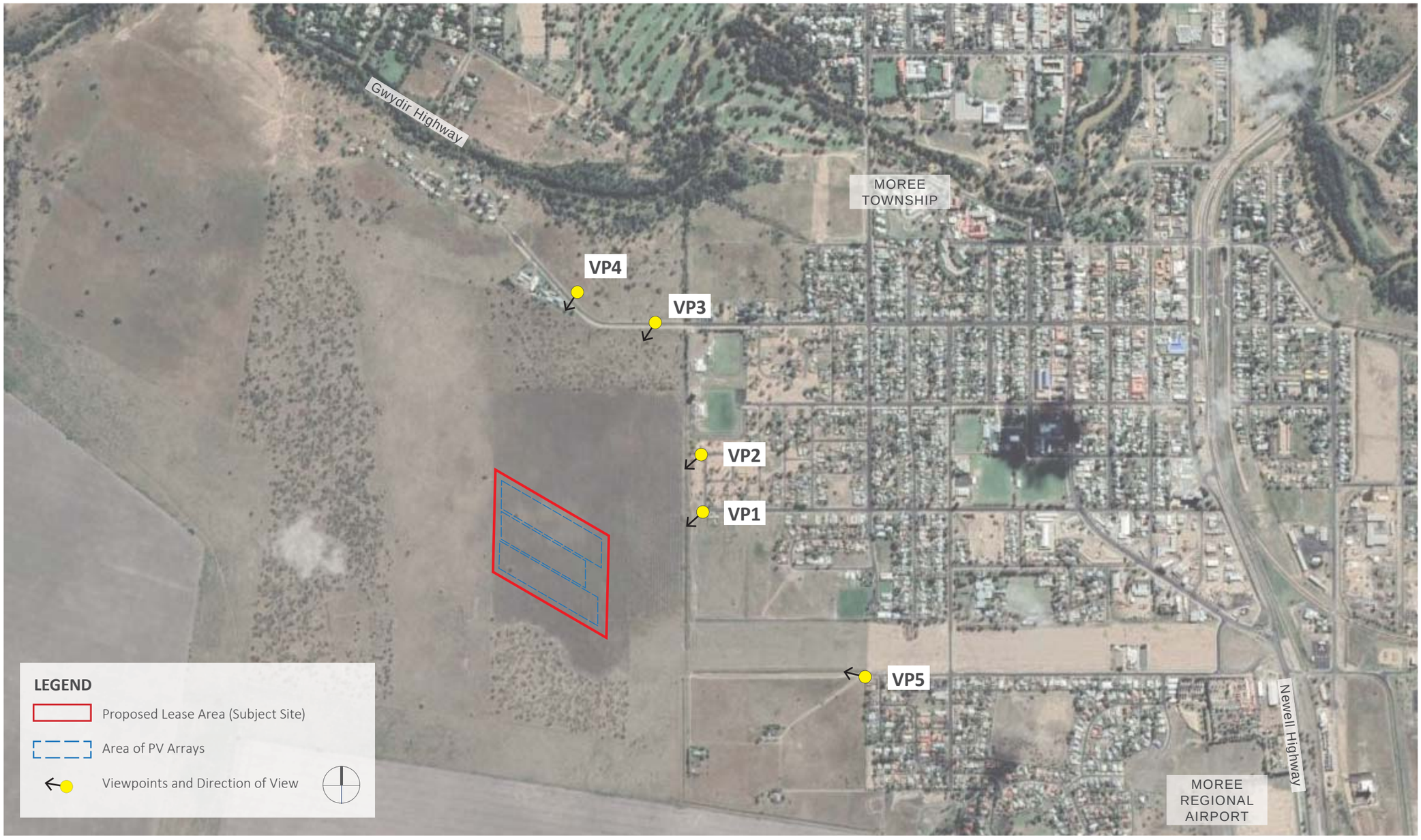


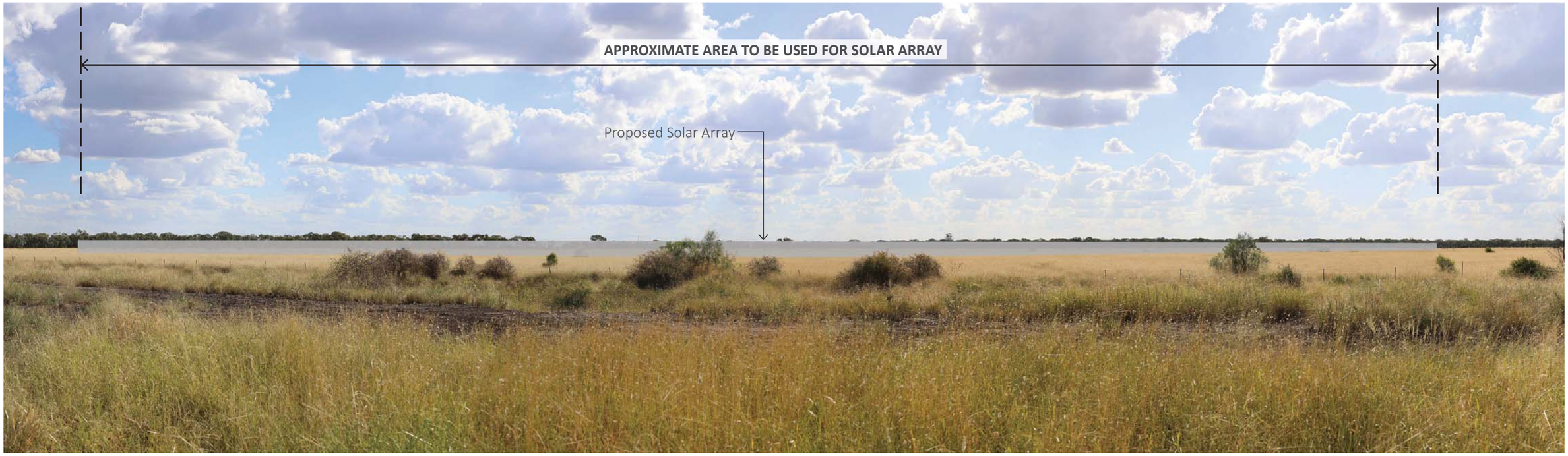
Figure 3. Selected Visual Receptors and Direction of View

During the site inspection of the site and local area, detailed photographic documentation was made of the landscape character and conditions in order to inform this report. There were a number of locations other than the listed viewpoints where photographs were taken to determine the degree of visibility of the site within the local area. These viewpoints although useful in determining the contextual character of the area did not provide clear and unencumbered views of the site and therefore were not used in the determination of potential visual impacts of the Solar Farm on the surrounding environment.

5.6.2 Viewpoint 1 - Existing

Receptor - VP1	Location
Coordinate Location	29°28’39” S 149°50’22” E (Approx)
View Description	View looking south west towards the Solar Farm from the end of Jones Avenue
Distance from Site	Approx. 390m
Comments • Typical rural views of the area showing flat site visually contained by surrounding vegetation in the distance.	

5.6.3 Viewpoint 1 - Proposed



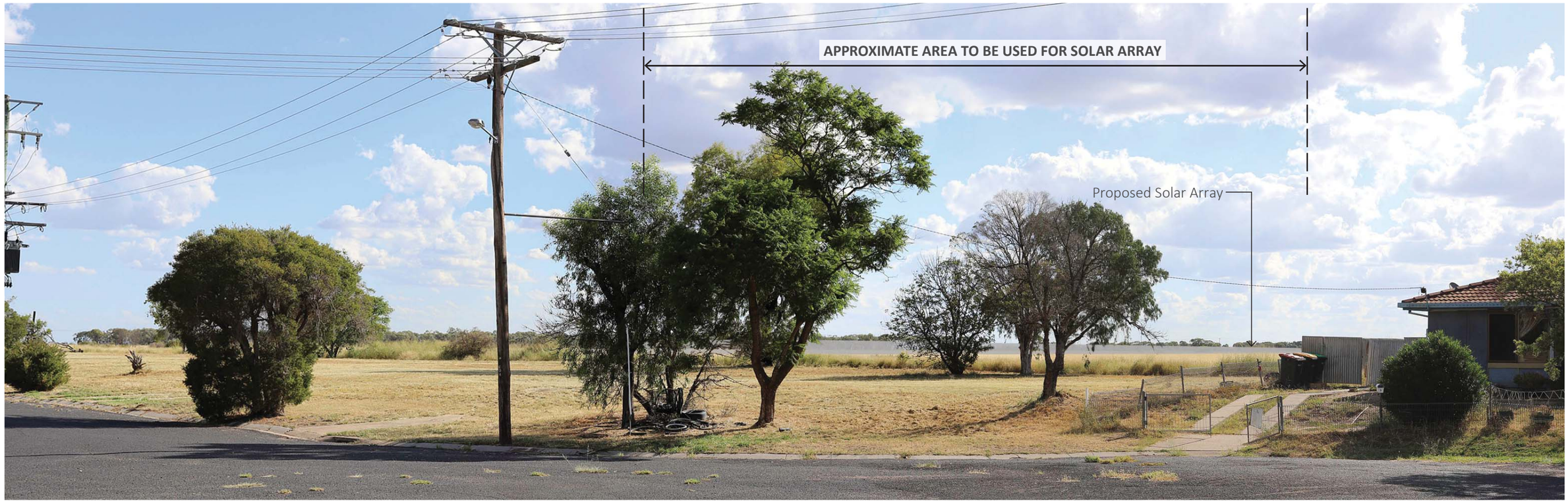
Receptor - VP1 Summary of Impact Assessment	
Receptor Sensitivity	Low
View Magnitude of Landscape Change	Medium
Impact Significance	Minor - Moderate
Mitigation Measures	• Shrub planting up to 3m on the eastern and northern sides of the array to integrate the views into the surrounding natural and rural landscape especially as viewed from the adjoining residential areas and local roads.

5.6.4 Viewpoint 2 - Existing

Receptor - VP2	Location
Coordinate Location	29°28’38.958” S 149°49’49.212” E
View Description	View looking south west towards the Solar Farm from Birrawee Place
Distance from Site	Approx. 360m

Comments
- Similar background rural landscape setting to Viewpoint with the addition of residential landscapes in the foreground.
- The background vegetation is not as visible but is still important in containing longer views and providing a natural visual element.

5.6.5 Viewpoint 2 - Proposed

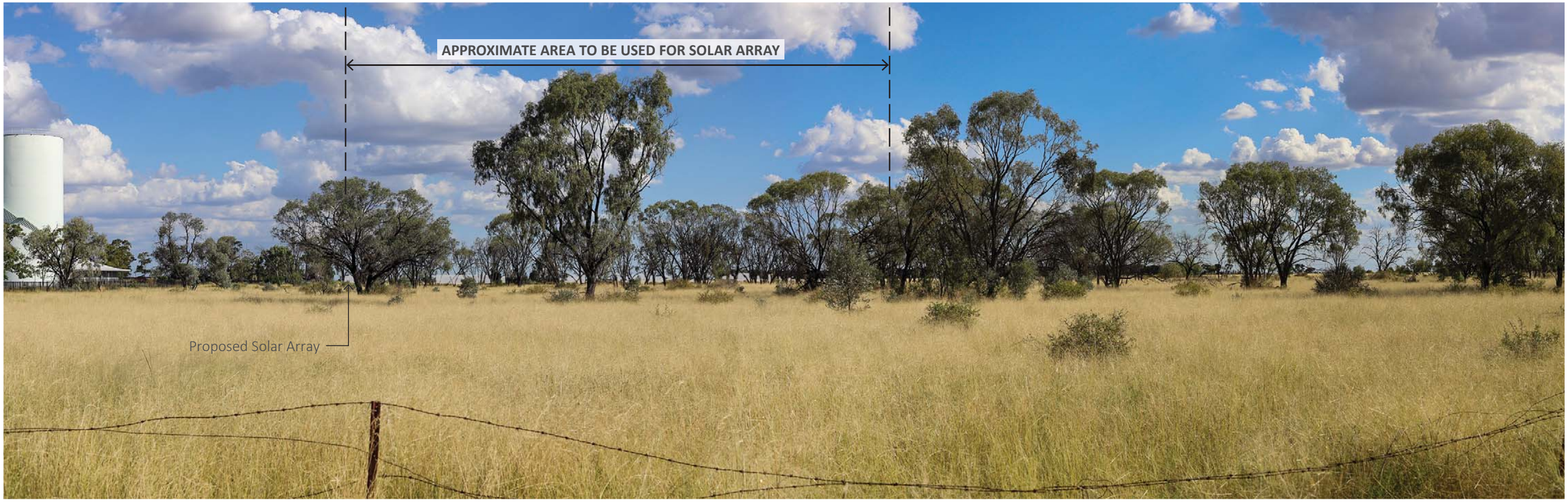


Receptor - VP2 Summary of Impact Assessment	
Receptor Sensitivity	Low
View Magnitude of Landscape Change	Medium
Impact Significance	Minor - Moderate
Mitigation Measures	• Shrub planting up to 3m on the eastern and northern sides of the array to integrate the views into the surrounding natural and rural landscape especially as viewed from the adjoining residential areas and local roads.

5.6.4 Viewpoint 3 - Existing

Receptor - VP3	Location
Coordinate Location	29°28’25.776” S 149°49’43.302” E
View Description	View looking South towards the Solar Farm site from Anne Street
Distance from Site	Approx. 550m
Comments • The vegetation in the foreground provides a more natural setting form this viewpoint., but the presence of the silo gives the distinct appearance of the rural setting of the area. Background vegetation is much less visible than from other viewpoints.	

5.6.5 Viewpoint 3 - Proposed



Receptor - VP3 Summary of Impact Assessment	
Receptor Sensitivity	Low
View Magnitude of Landscape Change	Low
Impact Significance	Minor
Mitigation Measures	• Shrub planting up to 3m on the eastern and northern sides of the array although from this viewpoint the existing vegetation between the site blocks most views to the proposed Solar Farm.

5.6.6 Viewpoint 4 - Existing

Receptor - VP4	Location
Coordinate Location	29°28’23.658” S 149°49’32.556” E
View Description	View looking South towards the Solar Farm site from Anne Street
Distance from Site	Approx. 500m

Comments
- The vegetation in the foreground provides a more natural setting form this viewpoint., but the presence of the silo gives the distinct appearance of the rural setting of the area. Background vegetation is much less visible than from other viewpoints

5.6.6 Viewpoint 4 - Proposed

Receptor - VP4 Summary of Impact Assessment	
Receptor Sensitivity	Low
View Magnitude of Landscape Change	Negligible
Impact Significance	Minor - Negligible
Mitigation Measures	• Shrub planting up to 3m on the eastern and northern sides of the array although from this viewpoint the existing vegetation between the site blocks most views to the proposed Solar Farm.

5.6.6 Viewpoint 5 - Existing

Receptor - VP5	Location
Coordinate Location	29°29’4.086” S 149°50’9.03” E
View Description	View looking West from Amaroo Drive towards the Solar Farm site
Distance from Site	Approx. 870m
Comments • Typical rural views of the area showing flat site visually contained by surrounding vegetation in the distance.	

5.6.6 Viewpoint 5 - Proposed

Receptor - VP5 Summary of Impact Assessment	
Receptor Sensitivity	Low
View Magnitude of Landscape Change	Low
Impact Significance	Minor
Mitigation Measures	• Shrub planting up to 3m on the eastern and northern sides of the array to integrate the views into the surrounding natural and rural landscape especially as viewed from the adjoining residential areas and local roads.

6. SUMMARY OF ASSESSMENT

6.1 Summary of Assessment

The visual environment for the subject site and surrounding area is characterised by open, flat rural land.

Whilst the subject site has been cleared of vegetation, the local rural character of the area is evident and reinforced by the surrounding land uses and vegetation to the north, south and west of it.

Although the site location is relatively close to the urban edge of Moree, views of the site are typically not visible from major roads and the majority of urban and rural areas within the area. This is due to the presence of vegetation and development that screens the site from major viewpoints.

Visibility from the from the local roads and streets close to the site is generally low to moderate due to the flat nature of the land and surrounding development. However from viewpoints along the limited number of roads and residential dwellings adjoining the site, visibility is higher.

Views from major roads and from higher density urban areas within Moree are limited to non-existent due to the distance from these viewpoints and the local visual obstructions. Given this limited visibility, to the site for the majority of sensitive receivers in the areas, the effects on landscape character is considered to be limited.

The Solar Farm is considered to have an overall Effect Significance of **Minor.**

6.2 Mitigation Measures

As described in the summary for each of the 5 viewpoints, the relatively low height and nature of the Solar Farm along with the distances from the site will mean that it will have limited visibility within the landscape. Given the minor visual change to the rural landscape especially from public viewpoints, select mitigation measures are recommended to further reduce the visual impact of the Solar Farm.

This would include shrub planting up to 3m in height along the eastern and northern frontages of the solar array. This would screen views from local residential dwellings and local roads to the Solar Farm and integrate it with the surrounding established landscape character behind.

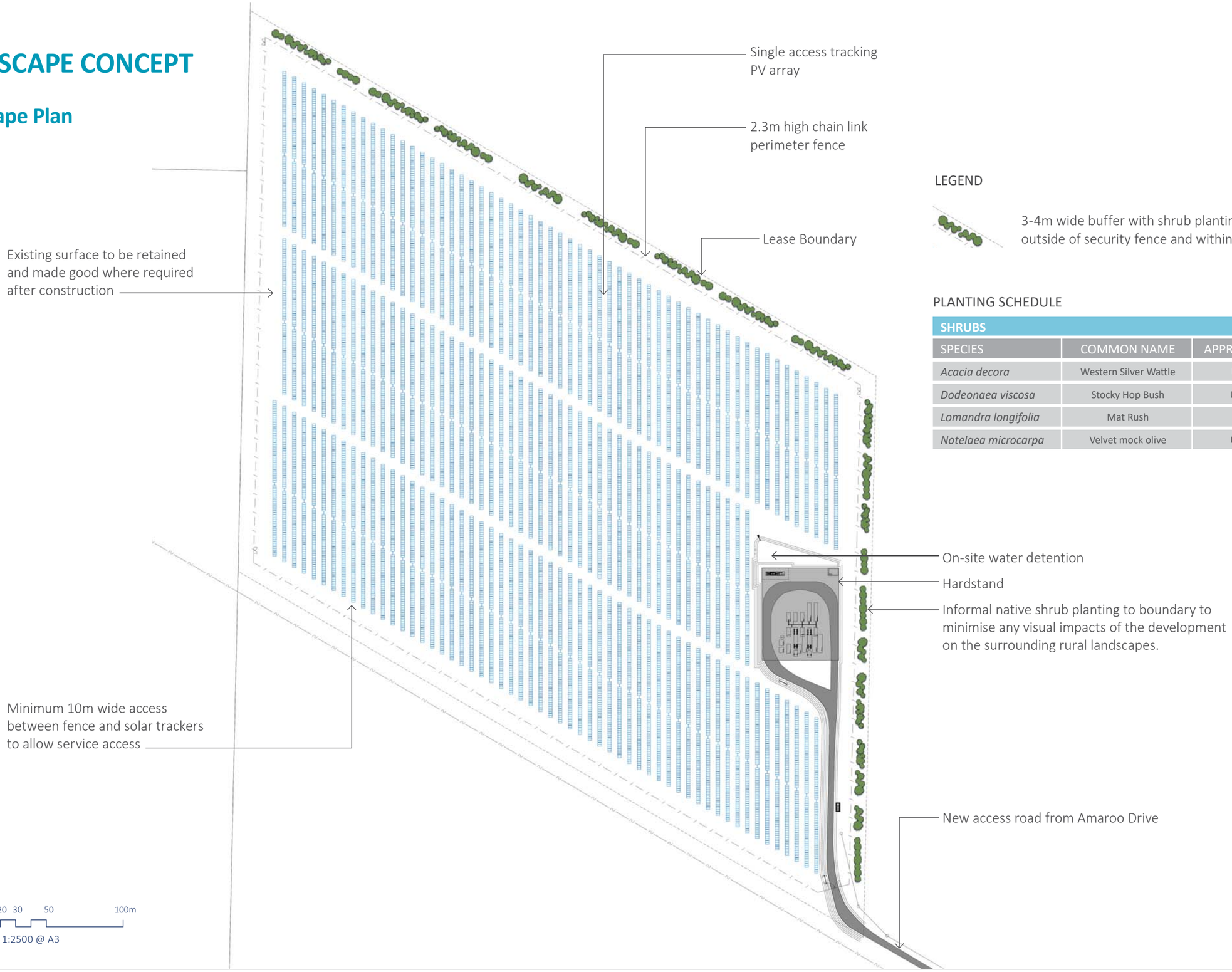
Planting along the western and northern boundaries is not considered necessary due to the limited number viewpoints available and limited visibility to these sides. The existing vegetation obscures the majority of views to the Solar Farm from these aspects.

Table 4. Summary of Visual Impact Ratings for each Receptor

Receptor	Receptor Sensitivity	Magnitude of Change	Effect Significance
VP1	Low	Medium	Minor - Moderate
VP2	Low	Medium	Minor - Moderate
VP3	Low	Low	Minor
VP4	Low	Negligible	Minor - Negligible
VP5	Low	Low	Minor

7. LANDSCAPE CONCEPT

7.1 Landscape Plan



LEGEND

3-4m wide buffer with shrub planting (native species) outside of security fence and within the lease boundary

PLANTING SCHEDULE

SHRUBS			
SPECIES	COMMON NAME	APPROX. HEIGHT	POT SIZE
Acacia decora	Western Silver Wattle	Up to4m	150mm
Dodeonaea viscosa	Stocky Hop Bush	Up to 4m	150mm
Lomandra longifolia	Mat Rush	1m	50mm
Notelaea microcarpa	Velvet mock olive	Up to 2m	50mm

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