5.0 Visual Impact (contd.)

5.4 Visual Impacts

5.4.1 OVERVIEW OF VISUAL IMPACT

The nature and scale of the project will create a new landscape and visual environment. This part of the report will assess the source and magnitude of development effects on the existing landscape elements, character and quality in the context of the site and its environs.

Overall the proposed Manildra Solar Farm would result in impacts on the existing surrounding environment in terms of landscape and scenic values. The visual impacts associated with the proposal will vary depending on the viewing location. The potential visual impacts associated with the proposed development are assessed below.

The Solar Panels are relatively low lying, reaching a height of approximately 2-3m above the existing ground level. The solar farm is arranged as an array of panels arranged in an east-west direction, facing approximately north on an angle of 30 degrees. The highest visual effect of the PV panels is likely to be seen from the north and south, where the most surface area is visible. Visibility of the solar farm from the east and west will be significantly lower. The visual impact is mostly likely to be at its highest during the construction phase.

Existing landscape features of the region which assist in the reduction of the visual impact of the Site have been illustrated in the visual impact analysis (figure 10) on page 33 of this report.

Riparian vegetation associated with Mandagery Creek to the east of Manildra provides a strong visual screen for a large percentage of developed area. The natural topography prevents views to the site from residential properties to the south of the Site associated with Old Orange Road.

Areas surrounding the proposed development are largely uninhabited parcels of undulating land with a sparse coverage of woodland vegetation. The Site upon which the development is proposed is characterised by an undulating, cleared pastoral land.

The highest visual impact would be felt from those areas within the immediate vicinity of the proposed development. In particular a narrow section of Molong Manildra Road as represented in photomontages.

The Molong Manildra Road is located approximately 500m to the east at its closest point. Views from Molong Manildra Road are towards the western edge of the proposed development and would be seen as a grey line within the landscape. Due to topography and existing vegetation, views to the site other than Manildra Molong Road are restricted to areas of private land. No residence are located within these vantage areas.

A review of the potential visibility from areas surrounding the Study Site is summarised in Section 5.3.3 of this section.

5.4.2 VIEWPOINT VISUAL IMPACT SUMMARY

Of the 9 viewpoints assessed the proposed development would be visible from 7 viewpoints. Of these viewpoints 7, one was assessed as having a low visual impact and 6 were assessed as having a moderate visual impact.

A summary of the viewpoint assessments is included in Table 3.

VIEWPOINT	VISUAL SENSITIVITY	VISUAL EFFECT	VISUAL IMPACT
MASF01	Moderate	Low	Low
MASF02	-	-	-
MASF03	Moderate	Moderate	Moderate
MASF04	Low	High	Moderate
MASF05	Low	High	Moderate
MASF06	Moderate	Moderate	Moderate
MASF07	Low	High	Moderate
MASF08	Low	High	Moderate
MASF09	-	-	-

Notes:
1. The visual impact has not been assessed for viewpoints where the proposal would be screened from view.

Table 3: Summary of Viewpoints Visual Impact

5.0 Visual Impact (contd.)

5.4.3 REVIEW OF VISIBILITY FROM AREAS SURROUNDING THE STUDY SITE

Views to the Site from Manildra:

The Manildra Town and associated residential development are located approximately 1.2km south west of the Study Site. The Town is bounded on its eastern edge by the Mandagery Creek, with its associated vegetation. The Riparian Vegetation creates a visual barrier between the town and the Study Site. The proposed Solar Farm will not be visible from the town or associated residential properties.

Views to the Site from the north:

To the north of the Site, the land is generally characterised by uninhabited pastoral land. A small number of homesteads are located to the north of the Site. The closest property is Yarran farmhouse, from which the Site would be obscured by a rise in topography between the Site and farmhouse. Viewpoint MASF02 is taken from the property entry.

The nearest properties north of the Yarran Farmhouse are sited approximately 2.3km north of the Site. A sparse coverage of remnant woodland vegetation and undulating topography prevent views of the Site from these properties.

Views to the Site from the east:

East of the Site, the landscape is characterised by uninhabited, undulating grazing land. The closest residential property to the east of the Site, is located at a distance of approximately 2km. The Site would not be visible from these properties.

Views to the Site from the south:

The closest residence to the south of the Site are located along Old Orange Road. These rural residential properties are located approximately 500m from the sites southern boundary. Views from these properties are impeded by a rise in topography south of the Site.

The Broken Hill Railway runs in an east-west direction to the south of the Site. The proposed development will not be visible from passenger trains traveling along this road due to the undulating topography and coverage of vegetation north of the railway line. Orange Road follows the same route as the railway and as a result views to the Site from the road will be impeded by topography and vegetation.

Views to the Site from the west:

Two homesteads are located approximately 600 metres to the west of the Site on the eastern side of the Molong Manildra Road. A combination of the existing roadside vegetation and foreground planting associated with the homesteads buffer views towards the Site.

Views to the Study Site from residential properties to the east of Manildra, along Mandagery Lane will be impeded by dense remnant woodland vegetation between the site and rural properties. Beyond these properties to the east of the Mandagery Creek riparian vegetation creates a visual buffer towards the Site.

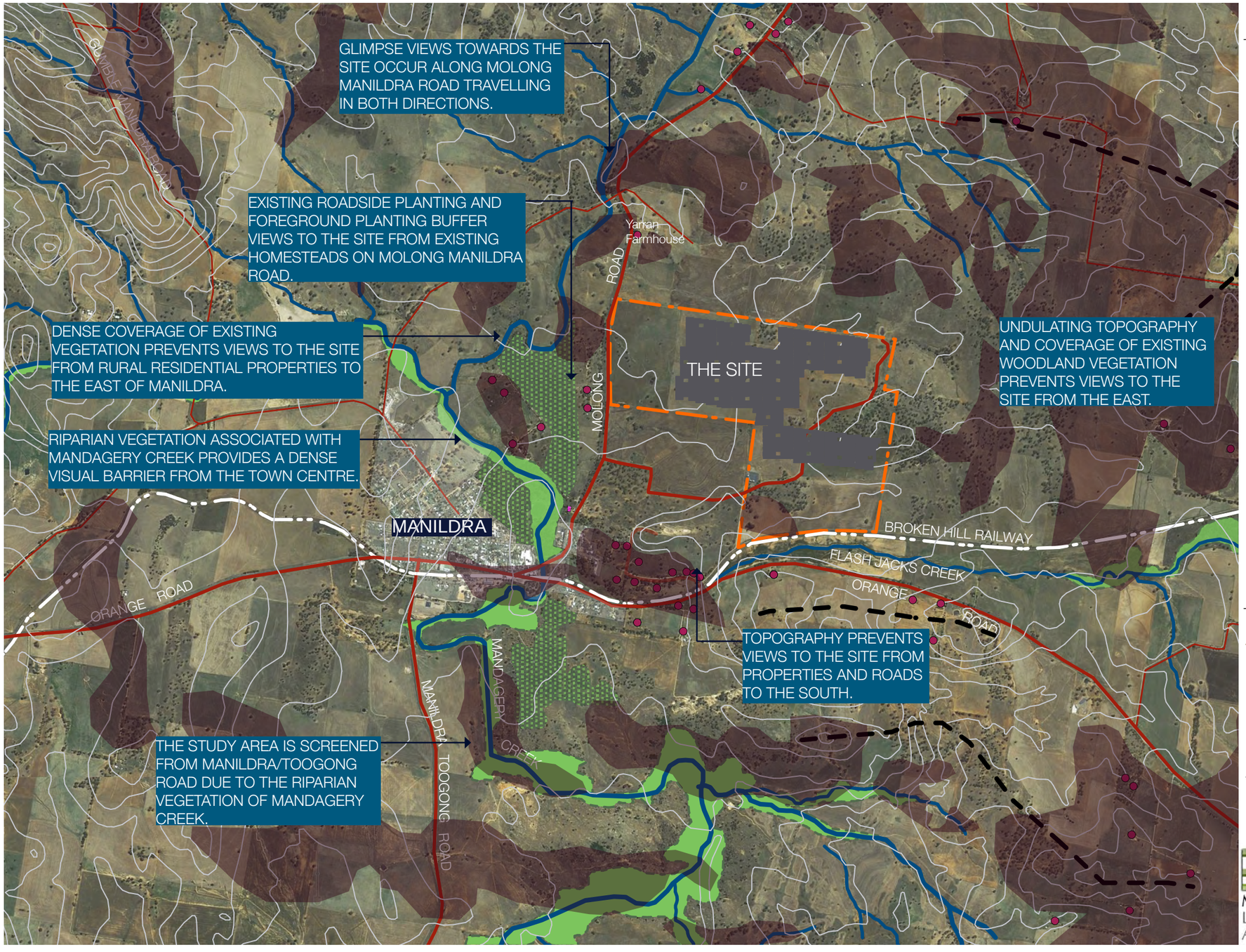
Molong Manildra Road:

Traveling in a southern direction along the Molong Manildra Road towards Manildra Road, glimpse views towards the Study Site will be visible along a 500m stretch of road approximately 2.6km from the manildra town centre. Views to the Study Site in all other sections are restricted due to topography, roadside planting and the distance to the Site.

Manildra Toogong Road:

The Manildra Toogong Road runs in a north-south direction towards Manildra. Traveling along this road in a northerly direction views to the Site are obscured by the dense riparian vegetation associated with Mandagery Creek.

5.0 Visual Impact (contd.)



LEGEND

- Extent of the Site
- River/Creekline
- Railway Line
- Major Road
- Existing Substation
- Riparian Vegetation
- Existing Woodland Vegetation
- Areas from which the proposed solar farm will not be visible, based on topography.
- Ridgeline

N

0 0.5 1.0 1.5km

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Figure 10: Visual Impact Analysis

5.0 Visual Impact (contd.)

5.5 Reflectivity

There is a perceived issue of glint and glare surrounding the reflectivity of the proposed PV solar panels. As a result of the perceived reflection levels, there is a concern of possible distractions to motorists, aircraft and the hazard of eye damage.

The Poly-Crystalline Solar Panels proposed for the installation (see figure 12) are designed to absorb the suns energy and directly convert it to electricity. The PV modules being used in the installation for the Manildra Solar Farm absorb approximately 82-90% of the light received. The SunTech Solar Panels proposed for the Manlidra Solar Farm have been designed using two anti-reflective coatings which effectively reduces the reflectivity. Innovative methods of developing the required metal contact on the face of the solar panel reduces the metal surface area and further reduces any potential glare..

PV Solar Panels have been installed at a number of airports in the USA, including Denver and the Oakland FedEx International Airport Hub. These precedents and further studies have found that the reflection created would not cause problems for aircraft, particularly at the critical take off and landing stage.

The level of glare and reflectance from the PV solar panels are considerably lower than the level of glare and reflectance of in common surfaces and those surrounding the proposed Solar Farm. The PV panels would reflect approximately 10-18% of energy which is less than typical rural environments which have a reflectivity of approximately 15-30%. Figure 11 compares the percentage of reflected energy from common reflective surfaces to that of a PV Solar Panel.

Denver International Airport Solar Farm
http://www.oureverydayearth.com

Nellis Air Force Base
http://www.seqsoftware.com.au

Figure 12: Suntech VD 280 PV Solar Panel
http://am.suntech-power.com/

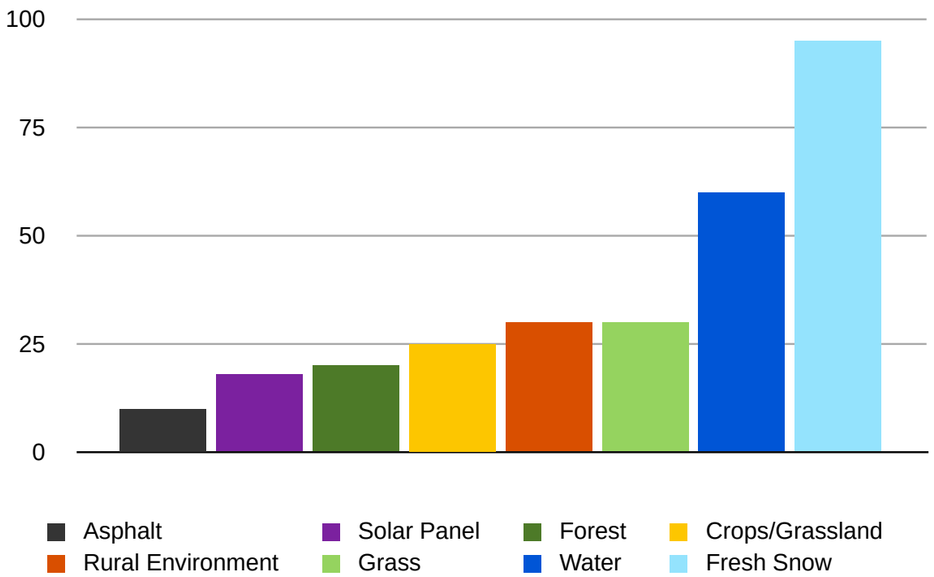

Figure 11: Comparative reflection analysis.

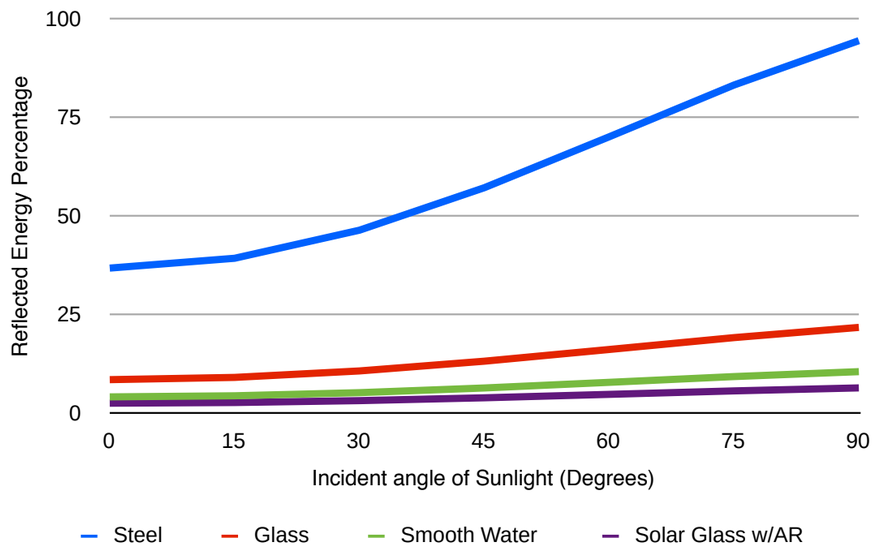

Figure 13: Analysis of typical material reflectivity.

6.0 Conclusion

The proposed Manildra Solar Farm is a renewable energy source which involves the installation of solar panels over 120ha of existing rural landscape.

With all visual impact assessments the objective is not to determine whether the proposed impact is visible or not visible, it is to determine how the proposal will impact on the existing visual amenity, landscape character and scenic quality. If there is a potential for a negative impact on these factors it must then be investigated if and how this impact can be mitigated to the extent that the impact is reduced to an acceptable level.

The characteristics which influence the visual impacts associated with the proposal include:
- the sensitivity of the viewing location;
- the visibility of the development for residence and general public;
- the layout of the solar farm and size of the panels;
- the visual appearance of solar panels and associated ancillary works.

Overall the proposed Manildra Solar Farm would result in impacts on the existing surrounding environment in terms of landscape and scenic values. The proposed solar farm contrasts with the existing landscape character of the region which is typically rural, pastoral land. The Site is situated upon currently uninhabited, undulating, open, pastoral land.

To assist in quantifying the visual impact of the solar farm, 9 viewpoints were selected from a range of distances and elevations. Of the 9 viewpoints assessed, the solar farm would be visible from 6 viewpoints, being assessed as having a moderate visual impact.

The proposed solar farm is relatively low lying, with the panels spanning to a height of approximately 2-3m. The panels are approximately north facing on an angle of approximately 30 degrees. As a result the highest visual impact of the solar panels is expected to occur from the north and south.

The undulating topography of the region in conjunction with the proximity of the proposed solar farm to Molong Manildra Road inevitably result in the visibility of the solar farm from a range of viewpoints. However as the only publicly accessible viewpoints are located on a relatively short stretch of the Molong Manildra Road views to the farm are likely to be fleeting and unlikely to detract from existing rural landscape significantly character in the broader view.

The highest visual impact will be felt from the Molong Manildra Road, being approximately 500m from the western edge of the solar farm. However the speed of travel along the road combined with the distance from the Site would mean views of the proposed development would be fleeting.

For many, solar panels are a symbol of sustainability through technology and subsequently are considered to be a positive and interesting addition to the landscape regardless of the fact they contrast with the agricultural setting.

In the context of the area, the proposed solar farm development will have a moderate visual impact. Once proposed impact mitigation principles have been employed the visual impact of the proposed development will be significantly reduced. Proposed methods of mitigation for areas assessed as having a visual impact have been outlined in section 7.0 of this report.

In our professional opinion the proposed Manildra Solar Farm will have a low visual impact within the context of the landscape character and scenic quality of the region. The greatest visual impact would be apparent within the immediate vicinity of the solar farm however once landscape mitigation methods have been implemented and the growth of screen planting surrounding the site has matured, the visual impact of the Solar Farm will be minimal.