Final Report

Aeronautical Impact Assessment

and

Glare Analysis

Mangalore Solar Farm

CCP35M

Report to:

c/o Energy Forms

16 June 2021

Chiron Aviation Consultants
Essendon Vic 3040
Australia

DOCUMENT RELEASE APPROVAL

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EXECUTIVE SUMMARY

Energy Forms on behalf of Tetris Energy has requested Chiron Aviation Consultants undertake an Aeronautical Impact Assessment and Glare and Glint Analysis for the Mangalore Solar Farm located at Mangalore, Victoria.

The Aeronautical Impact Assessment considered three aerodromes within 20km of the Mangalore Solar Farm boundary. The two Unregulated Aerodromes at Puckapunyal and Locksley Field are sufficiently distant from the Mangalore Solar Farm boundary for there to be no impact on aircraft operations and no hazard to aircraft safety at these aerodromes.

The proposed solar farm will utilise low reflectivity single axis tracking photovoltaic panels mounted no more than 3m above ground level (AGL). The tracking axis is north/south with the panels rotating through 120º from east to west following the sun. Consequently, the panels do not face and therefore do not reflect toward, the runway centreline flight paths.

The Mangalore aerodrome is Regulated (Certified), has runway lighting for night operations and five published Instrument Approach Procedures allowing operations during inclement weather. These instrument approach procedures are used extensively for advanced pilot training. The Mangalore Solar Farm is 2nm (3.6km) south of the Runway 18/36 (north/south) southern (RWY 36) threshold. Aircraft taking off to the south on Runway 18 will pass over the solar farm on climb. The orientation of the solar panels is such that geometrically, the possibility of glare and glint is negligible. Aircraft landing to the north on Runway 36 will pass over the solar farm at a minimum of 500ft above it. Aircraft on the *base leg* of a standard arrival pattern will be approaching the solar farm from the west and, in the late afternoon, facing the solar panels. Due to the height and speed of the aircraft, glint and glare will not be a safety hazard.

Stakeholder interviews with the aerodrome operator and the two major aviation organisations based there, confirm that they are satisfied that the Mangalore Solar Farm will not be a safety hazard for aircraft operations at Mangalore.

The Glint and Glare Analysis utilised the *Sandia National Laboratories Solar Glare Hazard Analysis Tool (SGHAT).* This tool provides results that comply with the United States of America Federal Aviation Administration (FAA) requirements. The Australian Civil Aviation Safety Authority (CASA) accepts these results.

The SGHAT analysis for Mangalore shows that there is no glint or glare predicted for operations on Runway 18/36.

The glint and glare analysis for nearby roads and dwellings shows that there is no glare predicted.

The Mangalore Solar Farm is **not a hazard** to aviation safety.

The analysis demonstrates that there is **No Impact** to road or rail traffic nor nearby dwellings.

1. INTRODUCTION

Energy Forms on behalf of Tetris Energy has requested Chiron Aviation Consultants undertake an Aeronautical Impact Assessment and Glare and Glint Analysis for the Mangalore Solar Farm located northeast of Mangalore, Victoria.

1.1 Location

The proposed Mangalore Solar Farm (MSF) is located at the junction of Station Road and the Seymour ï Avenal Road, northeast of Mangalore.

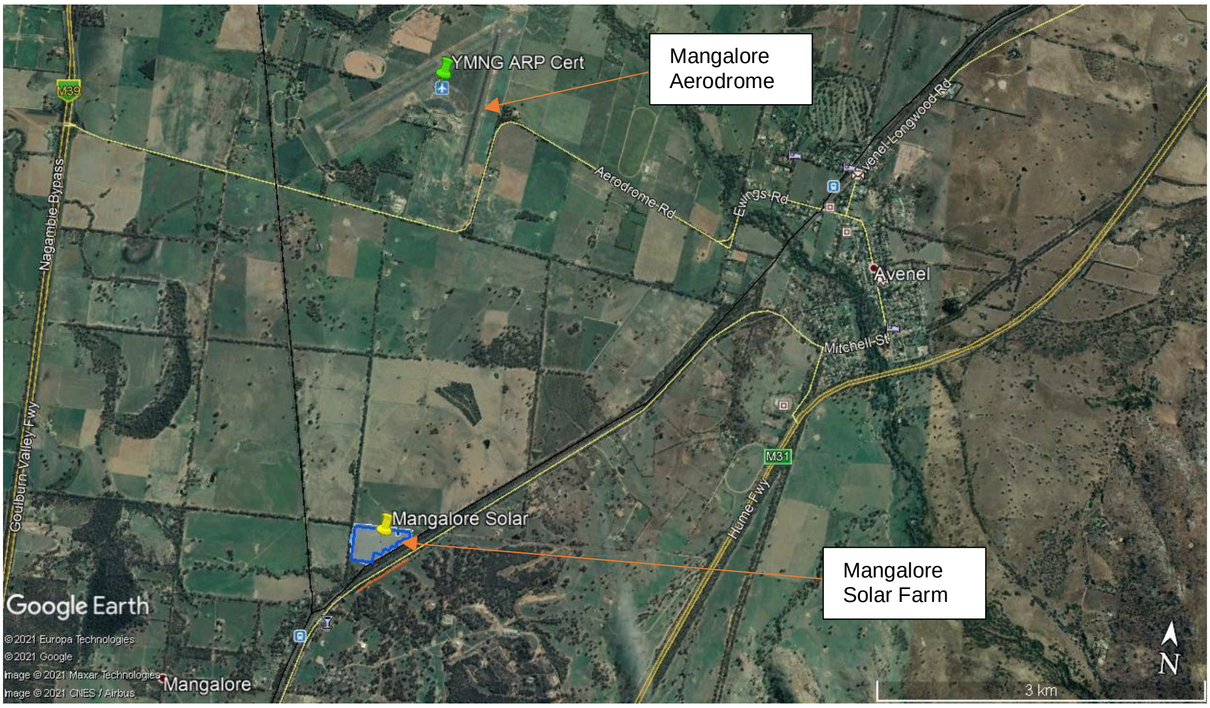

Figure 1 – Mangalore Solar Farm Location

The solar farm is 2nm (3.6km) south of the threshold of Runway 36 at Mangalore aerodrome (YMNG).

1.2 Aerodromes and Airstrips

Aerodromes fall into three categories:

- Military or Joint (combined military and civilian);
- Regulated (Certified); and
- Unregulated or Aeroplane Landing Areas

A Military aerodrome is operated by the Department of Defence and is suitable for the operation of military aircraft. A Joint User aerodrome is a Military aerodrome used by both military and A Regulated (Certified) Aerodrome is regulated under Civil Aviation Safety Regulation (CASR) 139.030. An aerodrome with a published instrument flight procedure must be regulated.

An Unregulated (Uncertified) Aerodrome is any other aerodrome or airstrip. These range in capability and size from having a sealed runway with lighting capable of accommodating corporate jet aircraft to a grass paddock that is smooth enough to land a single engine light aircraft or a purpose built aerial agricultural aircraft.

Military, Joint and Regulated aerodromes are listed in the Aeronautical Information Publication[1] (AIP) and are subject to a NOTAM[2] service that provides the aviation industry with current information on the status of the aerodrome facilities. This information is held in the public domain, is available through aeronautical publications and charts and is kept current by mandatory reporting requirements.

Unregulated Aerodromes are not required to be listed in the AIP, although many are, so information about them is not necessarily held in the public domain, may not be available through aeronautical publications and charts and is not required to be reported. Where Unregulated aerodrome information is published in the AIP EnRoute Supplement Australia (ERSA)[3] it is clearly annotated that a *full NOTAM service is not available*.

The AIP Designated Airspace Handbook (DAH)[4], at Section 20, lists *Aircraft Landing Areas (ALA) without an ERSA entry – verified*. This listing of verified ALA indicates that Airservices Australia have a registered responsible person providing verified information about the ALA. These verified ALA are also depicted on AIP Charts.

ALA can come into use and fall out of use without any formal notification to CASA or any other authority. Airstrips that appear on survey maps often no longer exist; others exist but do not feature on maps. Similarly, a grass paddock used as an ALA is not usually discernable on satellite mapping services such as Google Earth.

Military, Joint and Regulated aerodromes usually have Obstacle Limitation Surfaces (OLS) and Procedures for Air Navigation ï Operations (PANS-OPS) surfaces prescribed to protect the airspace associated with published instrument approach and landing procedures. An Unregulated aerodrome or ALA cannot have a published instrument approach and landing procedure so does not have associated prescribed airspace protected by OLS or PANS-OPS. All operations into ALA, therefore, must be conducted in accordance with the Visual Flight Rules (VFR) and in Visual Meteorological Conditions (VMC).

[1] AIP; a mandatory worldwide distribution system for the promulgation of aviation rules, procedures and information

[2] NOTAM (Notice to Airmen); a mandatory reporting service to keep aerodrome and airways information current and available to the aviation industry worldwide

[3] ERSA, part of the AIP that lists aerodrome information in accordance with standards and legislative requirements to ensure integrity.

[4] DAH, part of the AIP that lists the pertinent details of Australian airspace

1.3 Aerodromes in the Area

There are three aerodromes within 20km of the MSF boundary. These are:

- Mangalore (YMNG) - Regulated
  - 2.0nm (3.6km) north
- Puckapunyal (YPKL) ï Uncertified (Military aerodrome)
  - 6.6nm (12.25km) southwest
- Locksley Field (YLCS) ï Uncertified
  - 10.3nm (19km) northeast

The relative locations of these aerodromes are shown below at Figure 2.

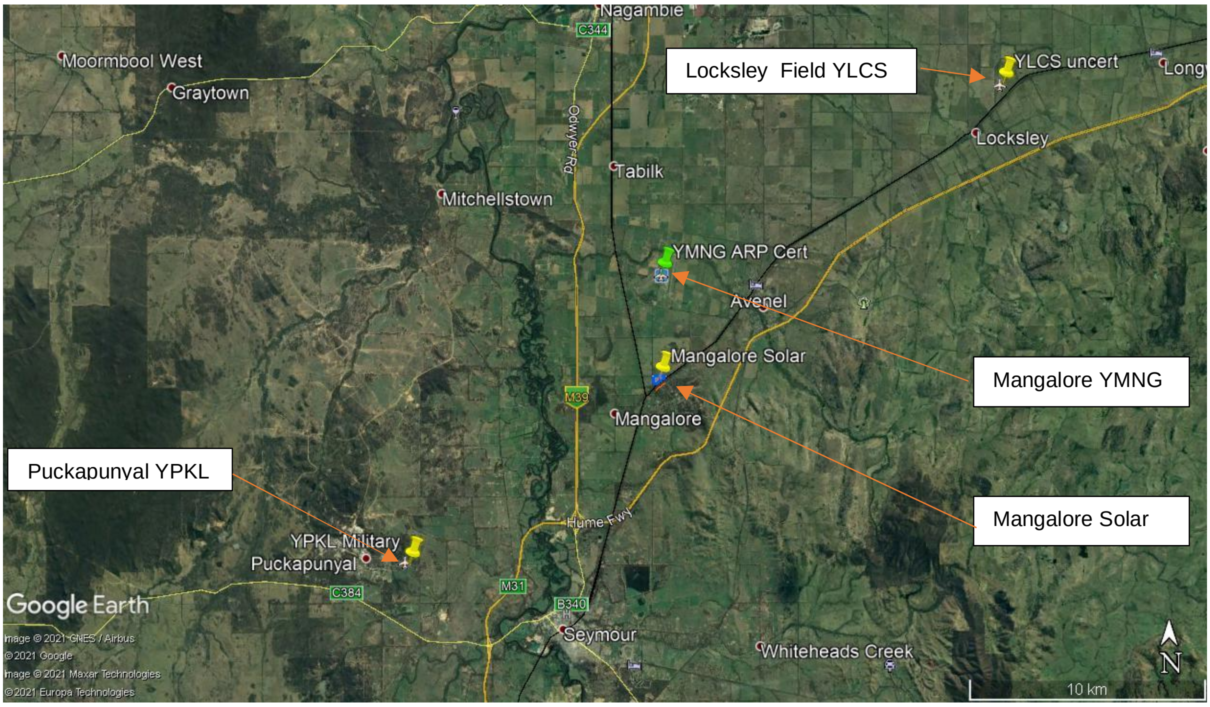

Figure 2 – Aerodrome locations near Mangalore Solar Farm.

1.4 Airspace above the Solar Farm

The proposed Mangalore Solar Farm is in Class G airspace below Class E airspace with a lower limit of 8500ft above the Australian Height Datum (AHD).

Class G airspace is non-controlled airspace where aircraft may operate without an Air

Traffic Control (ATC) clearance. Aircraft may operate in accordance with either Instrument Flight Rules (IFR) and Visual Flight Rules (VFR) within Class G airspace.

Class E airspace is controlled airspace open to both IFR and VFR flights. All aircraft must communicate with the ATC Centre and IFR aircraft require an ATC clearance.

A Control Area (CTA) is defined as a ñcontrolled airspace extending upwards from a specified limit above the earth.[5]ò

Within Class G airspace an aircraft flying in accordance with the Visual Flight Rules (VFR) away from a populous area is, when flying below 3000ft, required by Civil Aviation Regulation (CAR) 157[6] to remain at least 500ft above the highest point of the terrain **and any obstacle on it** within a radius of 600m [300m for a helicopter] from a point on the terrain directly below the aircraft. Over a populous area the requirement is 1000ft for the same aircraft.

1.5 Solar Farm Infrastructure

The proposed solar farm will utilise low reflectivity single axis tracking photovoltaic panels mounted no more than 3m above ground level (AGL). The tracking axis is north/south with the panels rotating through 120° from east to west following the sun.

The MSF will connect to the existing transmission line near the solar farm.

[5] AIP Enroute, ENR 1.4 ï 7, sec 3 dated 28 February 2019, available at http://www.airservicesaustralia.com/aip/current/aip/enroute.pdf last accessed 9 March 2020

[6] Civil Aviation Regulation (1988) 157 *Low Flying* available at https://www.legislation.gov.au/Details/F2019C00622

2. SCOPE

To meet the requirements of the Tetris Energy planning application, the study required Chiron Aviation Consultants to examine the proposed Mangalore Solar Farm in relation to solar reflection impacts on aviation activity, vehicular traffic and dwellings in the area and undertake the following tasks.

2.1 Aeronautical Impact Assessment

The Aeronautical Impact Assessment (AIA) investigates the impact of the Mangalore Solar Farm (MSF) on aviation activity in the area. Tasks undertaken include:

- Identifying aerodromes within 20km of the MSF boundary
- The identification and assessment of potential aviation risk elements through
  - Reference to Civil Aviation Safety Authority (CASA) publications
  - Reference to the Aeronautical Information Publication (AIP)
- Assessment of the perceived impacts of the solar farm on the operation of nearby aerodromes.

2.2 Glint and Glare Analysis

The Glint and Glare Analysis investigates, using Federal Aviation Administration (FAA) approved software, the likely occurrence of glare and glint and its impact on aerodromes and aviation activity in the area. Additionally, the glint and glare analysis investigates possible impact on nearby roads and dwellings.

3. METHODOLOGY

The following methodology was used to complete the tasks outlined in the scope.

3.1 Aeronautical Impact Assessment

The methodology for the Aeronautical Impact Assessment (AIA) was as follows:

- Review of the Aeronautical Information Publication (AIP) and Civil Aviation Safety Authority (CASA) documents to identify relevant physical and operational aviation issues that may be impacted by the solar farm
- Current aeronautical and topographical charts and maps were studied to assess the local terrain and identify any local aerodromes and other relevant features

3.2 Glint and Glare Analysis

The Glint and Glare Analysis utilises the *Sandia National Laboratories Solar Glare Hazard Analysis Tool (SGHAT).* This tool meets the United States of America, Federal Aviation Administration glare analysis requirements (78 FR 63276). These requirements are accepted by CASA.

A glare and glint analysis was also conducted for the roads adjoining the solar farm site as well as nearby dwellings.

4. AERONAUTICAL IMPACT ASSESSMENT

4.1 Aerodromes

A review of the appropriate aeronautical charts, the AIP and associated CASA documents identified one Regulated and two Unregulated Aerodromes in the vicinity of the MSF. Because this AIA is for a solar farm, which does not have tall structures (>40m), only aerodromes within 20km of the solar farm boundary were considered. The 20km distance was used, rather than the usual 15km, because of the proximity of published aircraft arrival and departure paths associated with Mangalore aerodrome.

4.1.1 Mangalore Aerodrome (YMNG)

Mangalore is a Regulated (Certified) aerodrome listed in the En-Route Supplement Australia (ERSA)[7]. YMNG has two sealed runways, Runway 18/36 (north/south) and Runway 05/23 (northeast/southwest). Both runways are equipped with runway and taxiway lighting for night operations.

YMNG has five Instrument Approach Procedures (IAP) including a ground based VHF Omni Range (VOR) approach for Runway 23. The other approaches are RNAV-Z GNSS satellite (GPS) based and service Runways 18, 36 and 23. The Runway 36 RNAV-Z (GNSS) approach passes overhead the Mangalore Solar Farm.

Aircraft taking-off to the south on Runway 18 pass directly overhead the MSF. Similarly, aircraft approaching to land on Runway 36 will track from the west and turn left to track north to the runway. This turn, depending on the aircraft size, will occur between 3nm and 2nm from the runway threshold. That is, the turn will be over or south of the MSF.

In all cases the aircraft will be between 500 and 1000 feet above the MSF when passing overhead.

[7] AIP, ERSA, FAC YMNG, Airservices Australia, dated 25 March 2021, https://www.airservicesaustralia.com/aip/pending/ersa/FAC_YMNG_25MAR2021.pdf

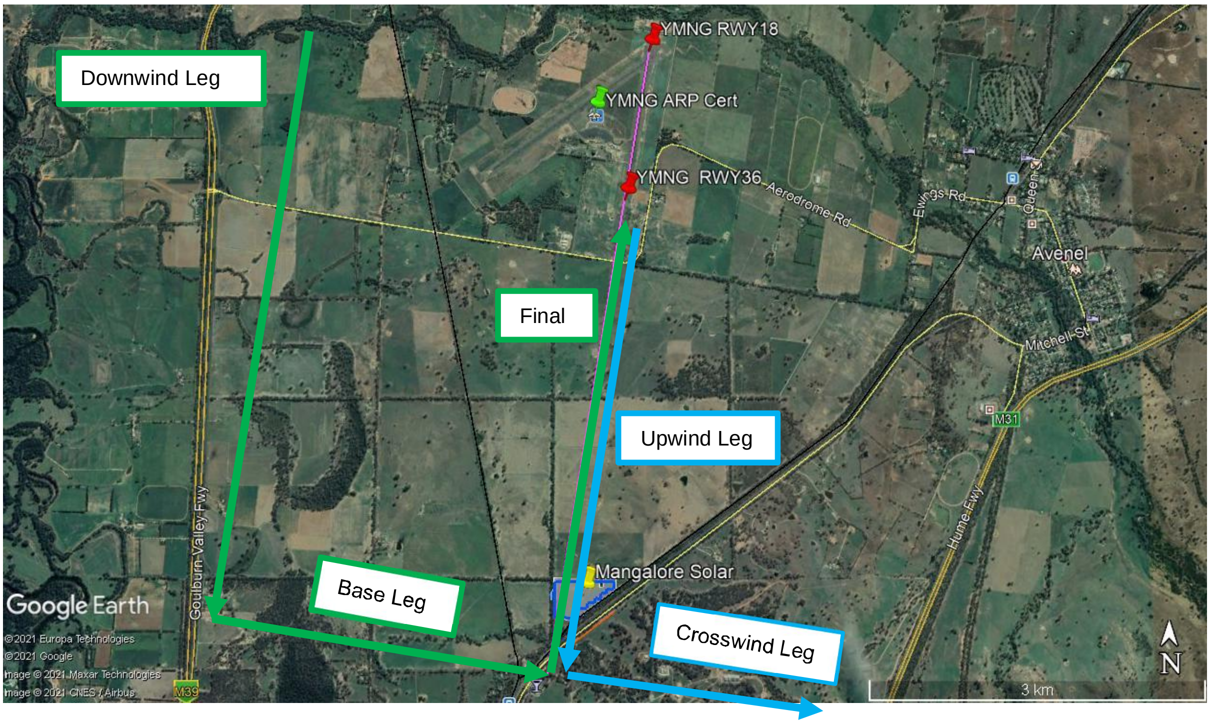

Figure 3 – YMNG Runway 36 Circuit Path (green)
YMNG Runway 18 Circuit Path Take-off (blue)

The Mangalore aerodrome operator and the two locally based aircraft operators, MAS Mangalore flying training school and Kestrel Aviation were interviewed. The flying training school was interested in possible glare and glint for aircraft operating in the Mangalore circuit, where they would be flying toward and over the MSF when using RWY 36.

The aircraft path flown for a landing on Runway 36 (to the north) is shown in green in figure 3. The aircraft flies the *downwind leg* parallel to the runway and then turns onto the *base leg* to turn onto *final* when lined up with the runway. Dependant on the aircraft size and speed the turn from *base* to *final* will occur between 2nm and 3nm from the runway threshold. If the turn from *base* to *final* occurs at 2nm from the runway threshold the aircraft will be tracking toward the MSF panels. In the late afternoon, when the panels are facing west, is the likely time for glint. The aircraft will be a minimum 500ft above the MSF for this turn. At that height, the likelihood of glint or glare is minimal and will not be a safety hazard to aircraft. As a mitigator, the chief instructor at the flying school advised that pilots would extend the downwind leg and turn onto base beyond the MSF.

Aircraft taking off on Runway 18 (to the south) will climb out straight ahead on runway heading toward the MSF. On this track the MSF solar panels are flat and there will be no glare or glint. The MSF uses single axis tracking for the solar panels, meaning they are flat in the north/south axis and rotate from the east over centre to the west.

The results of the glare and glint analysis are shown in section 5.1.1.

4.1.2 Puckapunyal (YPKL)

Puckapunyal is an Unregulated Military aerodrome not available for public use. There is a helicopter landing site (HLS) near the airstrip. YPKL is listed in ERSA.[8]

YPKL has one sealed runway, RWY 04/22 (northeast/southwest).

At 6.6nm (12.25km) southwest of the MSF this aerodrome is considered sufficiently distant for there to be no safety hazard to aircraft operations from glare or glint.

4.1.3 Locksley Field (YLCS)

Locksley Field is an Unregulated aerodrome listed in ERSA[9].

YLCS has one unrated gravel runway, RWY 01/19 (north/south). It is not equipped with runway lights and therefore not available for night operations.

At 10.3nm (19km) northeast of the MSF this airstrip is considered sufficiently distant for there to be no safety hazard to aircraft operations from glare or glint.

5. GLARE AND GLINT ASSESSMENT

Glint and glare are momentary and continuous excessive brightness that may affect nearby sensitive land uses, such as, road users and aviation.

The impacts of solar reflection vary for each type of receptor. The following criteria for glint and glare effects are a guide for glint and glare assessment.[10]

- **No Impact** a solar reflection is not geometrically possible, or it will not be visible from the assessed receptor. No mitigation required.
- **Low Impact** a solar reflection is geometrically possible, but the intensity and duration of an impact is considered to be small and can be mitigated with screening or other measure.
- **Moderate Impact** a solar reflection is geometrically possible and visible, but the intensity and duration of an impact varies according to conditions. Mitigation measures (such as through design, orientation, landscaping, or other screening method) to reduce impacts to an acceptable level will be required.
- **Major Impact** a solar reflection is geometrically possible and visible under a range of conditions that will produce impacts with significant intensity and duration. Significant mitigation measures are required if the proposed development is to proceed.

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[8] AIP, ERSA, FAC YPKL, Airservices Australia, dated 25 March 2021, https://www.airservicesaustralia.com/aip/pending/ersa/FAC_YPKL_25MAR2021.pdf

[9] AIP, ERSA, FAC YPKL, Airservices Australia, dated 25 March 2021, https://www.airservicesaustralia.com/aip/pending/ersa/FAC_YLCS_25MAR2021.pdf

[10] *Solar Energy Facilities, Design and Development Guidelines*, Department of Environment, Land, Water and Planning, August 2019 page 23.

5.1 Aerodromes

As discussed in section 4, there are three aerodromes within 20km of the MSF.

5.1.1 Mangalore (YMNG)

As discussed in 4.1.1 the Mangalore Aerodrome is the closest to the MSF at 2nm (3.6km) north of the solar farm boundary. The Runway 18/36 extended centreline passes over the MSF at 2nm from the Runway 36 threshold (southern end of north/south runway).

The SGHAT analysis for Runway 18 at Mangalore shows that there is no glare or glint predicted out to 2nm from the southern end of the runway (Runway 36 threshold). The analysis also shows there is no glint or glare predicted for the Runway 36 circuit where the turn is over the MSF onto the final leg for landing.

The SGHAT analysis for Runway 18 take-off and Runway 36 landing at Mangalore shows there is no glare or glint predicted out to 2nm from the Runway 36 threshold.

Equates to **No Impact.**

5.1.2 Puckapunyal (YPKL)

At 6.6nm (12.25km) southwest of the MSF this aerodrome is considered sufficiently distant for there to be no safety hazard to aircraft operations due to glare or glint.

Equates to **No Impact.**

5.1.3 Locksley Field (YLCS)

At 10.3nm (19km) northeast of the MSF this airstrip is considered sufficiently distant for there to be no safety hazard to aircraft operations due to glare or glint.

Equates to **No Impact.**

5.2 Roads

There are two roads considered in this analysis. They are *Station Road* and the *Seymour – Avenal Road.* Both roads are shielded from possible solar reflection from the MSF by extensive tree lines along the road verges. The SGHAT analysis predicts no glare or glint.

Equates to **No Impact.**

5.3 Railway

The railway line runs parallel to the *Seymour – Avenal Road* and is shielded from possible solar reflection from the MSF by extensive tree lines along the railway and road verges.

Equate to **No Impact**.

5.4 Dwellings

All the nearby dwellings are shielded from possible solar reflection by the extensive tree lines along the road verges and other tree groves between the dwellings and the MSF. The SGHAT analysis predicts no glare or glint.

Equates to **No Impact.**

6. CONCLUSIONS

6.1 Aeronautical Impact Assessment

The AIA demonstrates that the MSF will not be a hazard to aircraft safety and does not impact the operations at Mangalore, Puckapunyal or Locksley Field aerodromes.

Whilst the MSF is 2nm from the Runway 36 threshold, aircraft operating on the base leg of the circuit and turning onto final overhead the MSF will not be affected by glare or glint due to their height above the solar panels. Stakeholder interviews confirm that the MSF will not be a hazard to aircraft safety.

6.2 Glint and Glare Analysis

The SGHAT demonstrates that there is no hazard to aircraft safety due to glare or glint from the MSF. This equates to **No Impact.**

The SGHAT analysis shows that there is no glare or glint hazard predicted for vehicular traffic. Both roads are shielded by extensive tree lined verges. This equates to **No Impact.**

Likewise, the railway line runs parallel to the road and is shielded by extensive tree lined verges. This equates to **No Impact.**

The analysis also shows that there is no glare and glint predicted for the dwellings proximate to the MSF. The nearby dwellings are on the other side of the road from the MSF and are therefore, shielded by the extensive tree lined verges. This equates to **No Impact.**

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APPENDIX A

SGHAT Analysis
Mangalore Solar Farm

APPENDIX A

ForgeSolar

Site Configuration: Mangalore 5

Project site configuration details and results.

Created **Dec. 13, 2020 7:59 p.m.**
Updated **Jan. 31, 2021 8:51 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC10**
Site Configuration ID: 46996.8490

Summary of Results No glare predicted!

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
PV array 1	SA tracking	SA tracking	0	0	-

Component Data

PV Array(s)

Note: PV array encompasses a large surface area (greater than 25 acres). Accuracy of path receptor glare analysis may be affected by footprint size. Additional analyses of array sub-sections may provide more information on expected glare.

Name: PV array 1
Axis tracking: Single-axis rotation
Tracking axis orientation: 0.0 deg
Tracking axis tilt: 0.0 deg
Tracking axis panel offset: 0.0 deg
Maximum tracking angle: 60.0 deg
Resting angle: 60.0 deg
Rated power: -
Panel material: Light textured glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 9.16 mrad
Approx. area: 147,244 sq-m

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	m	m	m
1	-36.926837	145.180267	155.90	1.00	156.90
2	-36.929907	145.180331	160.57	1.00	161.57
3	-36.930113	145.180363	160.87	1.00	161.87
4	-36.930122	145.182724	159.27	1.00	160.27
5	-36.927978	145.186296	160.16	1.00	161.16
6	-36.926923	145.186302	153.87	1.00	154.87
7	-36.926940	145.185288	153.90	1.00	154.90
8	-36.927755	145.185256	156.82	1.00	157.82
9	-36.927720	145.184644	154.30	1.00	155.30
10	-36.926897	145.184591	154.15	1.00	155.15

2-Mile Flight Path Receptor(s)

Name: FP 1
Description:
Threshold height : 15 m
Direction: 6.6 deg
Glide slope: 3.0 deg
Pilot view restricted? Yes
Vertical view restriction: 30.0 deg
Azimuthal view restriction: 50.0 deg

Point	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	m	m	m
Threshold	-36.895716	145.187410	141.49	15.24	156.73
2-mile point	-36.924436	145.183238	153.56	171.85	325.42

Route Receptor(s)

Name: Route 1
Route type Two-way
View angle: 50.0 deg

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	m	m	m
1	-36.932930	145.179461	161.39	1.00	162.39
2	-36.926686	145.189654	165.95	1.00	166.95

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	m	m	m
OP 1	-36.926416	145.195512	181.29	1.00	182.29
OP 2	-36.933500	145.177571	157.11	1.00	158.11
OP 3	-36.933075	145.189529	168.37	1.00	169.37
OP 4	-36.928787	145.161613	151.68	300.00	451.68
OP 5	-36.945149	145.176634	152.94	304.00	456.94

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
PV array 1	SA tracking	SA tracking	0	0	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

PV array 1 no glare found

Component	Green glare (min)	Yellow glare (min)
FP: FP 1	0	0
OP: OP 1	0	0
OP: OP 2	0	0
OP: OP 3	0	0
OP: OP 4	0	0
OP: OP 5	0	0
OP: OP 6	0	0
Route: Route 1	0	0

No glare found

Assumptions

- Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
- Glare analyses do not account for physical obstructions between reflectors and receptors. This includes buildings, tree cover and geographic obstructions.
- Detailed system geometry is not rigorously simulated.
- The glare hazard determination relies on several approximations including observer eye characteristics, angle of view, and typical blink response time. Actual values and results may vary.
- The system output calculation is a DNI-based approximation that assumes clear, sunny skies year-round. It should not be used in place of more rigorous modeling methods.
- Several calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare.
- The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
- Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
- Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
- Glare vector plots are simplified representations of analysis data. Actual glare emanations and results may differ.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

APPENDIX B

Stakeholder List
Mangalore Solar Farm

APPENDIX B

The following organisations were consulted.

Stakeholder	Contact
MAS Mangalore Flying Training Academy	Operations Manager (Chief Flying Instructor)
Kestrel Aviation	Operations Manager
Mangalore Airport	Airport Manager