



TAPPAS AVIATION CONSULTANT (PTY) LTD
Reg:2019/104563/07
Tobie du Toit
Telephone Number: 082 603 5033
Email Address: tappastobie@gmail.com

AGES Limpopo (Pty) Ltd
120 Marshall Street
Polokwane, 0699

Attention Me Engela Grobler

**AVIATION ASSESMENT FOR PROPOSED RENEWABLE ENERGY GENERATION PROJECT AND
POWERLINE - LICHTENBURG SOLAR PARK, NORTH WEST PROVINCE**

- Appendix 1: TAC/AGES/021/ dd 2022/04/29 – Lichtenburg Airport
- Appendix 2: TAC/AGES/022/ dd 2022/04/29 – Orientation Map
- Appendix 3: TAC/AGES/023/ dd 2022/04/29 – Elevation Map
- Appendix 4: TAC/AGES/024/ dd 2022/04/29 – Planview of Lichtenburg Airport Runways
- Appendix 5: TAC/AGES/025/ dd 2022/04/29 – Sideview of Flight Path Runway 36

INTRODUCTION

The development of solar developments throughout South Africa means that new renewable energy plants and overhead transmission lines are sometimes developed near existing civil and military airbases. The aviation assessment is done to determine if a proposed renewable energy generation project will interfere with the Obstacle Limitation Surfaces of airports in the vicinity of the project.

Matrigenix (Pty) Ltd is proposing the establishment of a renewable energy generation facility (Photovoltaic Power Plant) with associated infrastructure and structures, and power line on Portion 25 of the Farm Houthaalboomen 31 IP and Portion 10 of the Farm Lichtenburg Town and Townlands 27 IP, Ditsobotla Local Municipality, Ngaka Modiri Molema District Municipality in the North West province.

The Lichtenburg Solar Park will deliver the electrical energy to the Eskom Watershed Substation, located on the Remainder Portion of the farm Lichtenburg Town and Townlands 27 IP.

The name of the facility will be the "LICHTENBURG SOLAR PARK".

ASSESSMENT METHODOLOGY

The applicant intends to undertake an activity identified in the scope of the Protocol for the Specialist Assessment and minimum Report Content Requirements for Environmental Impacts on Civil and Military Aviation Installations. A specialist assessment has been identified on the screening tool on a site identified as being of "low" sensitivity.

Although a "low" sensitivity has been identified, Tappas Aviation Consultant undertook a safeguarding assessment for the proposed new solar park and new transmission line in the North West Province in the vicinity of Lichtenburg Airport (FALI).

FALI is the ICAO (International Civil Aviation Organization) code for the Lichtenburg Airport.

There are no Military installations and also no promulgated Danger, Restricted and Prohibited areas according to the SACAA (South African Civil Aviation Authority) list in the vicinity of the Lichtenburg Solar Park.

It was decided to assess the development using the methodology of the assessment of the Obstacle Limited Surfaces as well as the Approach/Departure Surfaces of Lichtenburg Airport. This will be done in accordance with the ICAO and SACAA safeguarding rules and regulations.

According to the SACAA, Lichtenburg Airport is not a certified airport under Instrument Flight Rules. However, the possibility exists that the Lichtenburg Airport could become an Instrument Flight Rules airport in the future, therefore both the Obstacle Limited Surfaces as well as the Approach/Departure Surfaces will be assessed.

ASSESSMENT

A master drawing, TAC/AGES/020 dd 2022/04/25 was done in AutoCAD with distances, angles, and co-ordinates as on the Earth (WGS 84). Drawing TAC/AGES/026 dd 2022/04/29 was also done in AutoCAD to calculate the climb gradients and descent angle accurately. These drawings were used as master drawings to draw the technical drawing to be able to determine if there are any interferences to the obstacle limited surfaces of civilian airports and also promulgated danger, prohibited, and restricted areas as promulgated in the SACAA AIP. These two master drawings are available from TAC.

Technical drawing 1 of the Lichtenburg Solar Park project (TAC/AGES/021 dd 2022/04/29), was drawn on Google Earth. The Lichtenburg Airport and its runways as well as its position next to the Lichtenburg town are shown (Appendix 1).

Technical drawing 2 of the Lichtenburg Solar Park project (TAC/AGES/022 dd 2022/04/29), was drawn, using data from AGES Background Information Document – March 2022, on Google Earth. This is an orientation drawing to show the location of the Lichtenburg Solar Park and the Eskom Watershed Substation from Lichtenburg Airport. There are no SACAA promulgated areas in the vicinity of the project or the airport (Appendix 2).

Technical drawing 3 of the Lichtenburg Solar Park project (TAC/AGES/023 dd 2022/04/29), was also drawn, using data from AGES Limpopo Background Information Document – March 2022, on Google Earth to determine elevations for the different sites. Elevations of Lichtenburg Airport, Eskom Watershed Substation and Lichtenburg Solar Park are shown. There is an increase in elevation from the Lichtenburg Airport (1 486m) to the Eskom Watershed Substation (1 508m) and a continued increase to the Lichtenburg Solar Park (1 513m) (Appendix 3).

Technical drawing 4 of the Lichtenburg Solar Park project (TAC/AGES/024 dd 2022/04/29), was drawn using data from drawing TAC/AGES/020 and 022. Technical drawing 4 was drawn to determine if the Lichtenburg Solar Park project interferes with the flight paths of the runways of Lichtenburg Airport (Appendix 4).

It can be seen in Appendix 4 that the proposed Lichtenburg Solar Park and Powerline are located within the standard departure and approach flight path of runway 36. Therefore the safeguarding of the Obstacle Identification Surfaces of runway 36 must be investigated to be able to see if the departure and approach paths will be safe for aircraft departing and approaching from and to Lichtenburg airport. This will be done in Technical drawing 5.

The proposed Lichtenburg Solar Park is location is outside the flight paths of runway 06/24 and runway 18 and will therefore not interfere with the standard departures and arrivals flight paths on these runways. It will not be necessary to investigate the Obstacle Identification Surfaces of these runways.

Technical drawing 5 of the Lichtenburg Solar Park project (TAC/AGES/024 dd 2022/04/29), was drawn using data from TAC/AGES/020, 023, 024 and 026. Technical drawing 5 was drawn to determine if the Obstacle Limitation Surfaces of the Approach/Departure Surfaces of the Lichtenburg Solar Park project interferes with runway 18/36 of the Lichtenburg Airport. The approach angle and departure gradient surfaces of runway 18/36 were drawn in two different scales on TAC/AGES/026 to determine the correct angles to be drawn on TAC/AGES/025 for better detail and visual impact (Appendix 5).

The Produce Design Gradient (PDG) of 3.3% (200FT/NM), is the minimum climb gradient for departures and is the standard climb gradient that is used for departures of normal flights. The PDG of 3.3% from runway 36 clear the powerline at the Eskom Watershed Substation along the flight path by 112.29 meters and clear the powerlines at the Lichtenburg Solar Park by 151.48 meters.

The Obstacle Identification Surface (OIS) of 2.5% (152FT/NM) must clear all obstacles on the departure flight path. The OIS of 2.5% from runway 36 clear the powerline at the Eskom Watershed Substation along the flight path by 77.01 meters and clear the powerlines at the Lichtenburg Solar Park by 105.18 meters.

The 3° Approach Angle is the recommended descent angle for all approaches, if it differs from 3° it will be published for that specific airport. The 3° Approach Angle for runway 18 clear the powerline at the Lichtenburg Solar Park by 274.55 meters and at the end of the powerline at Eskom Watershed Substation at 205.39 meters.

From the drawings the Lichtenburg it can be verified that the Solar Park & Power Line project will not interfere or affect Lichtenburg Airport's Obstacle Limitation Surfaces or the Approach/Departure Surfaces due to the distance from the project plant site and powerline's location. Lichtenburg Airport reference point is 10.20Km (5.5NM) from the Eskom Watershed Substation and 12.98Km (7NM) from the Lichtenburg Solar Plant.

The location of the Lichtenburg Solar Plant and the powerline's location are safe for aircraft approaches and landings at Lichtenburg Airport as they are outside the limitations of the Obstacle Limitation Surfaces for the Approach on runway 18 and Departure on runway 36. Refer TAC/AGES/024 and 025 dd 2022/04/29 (Appendixes 4 & 5).

These drawings were constructed according to laid down regulations, manuals, and procedures by the International Civil Aviation Organization (ICAO) and the South African Civil Aviation Authority (SACAA).

CONCLUSION

Evidence from the assessment and the technical drawings show clearly that the Lichtenburg Solar Park will not interfere with the safeguarding of the Obstacle Limit Surfaces and the Approach/Departure Surfaces of Lichtenburg Airport (FALI).

Sincerely,



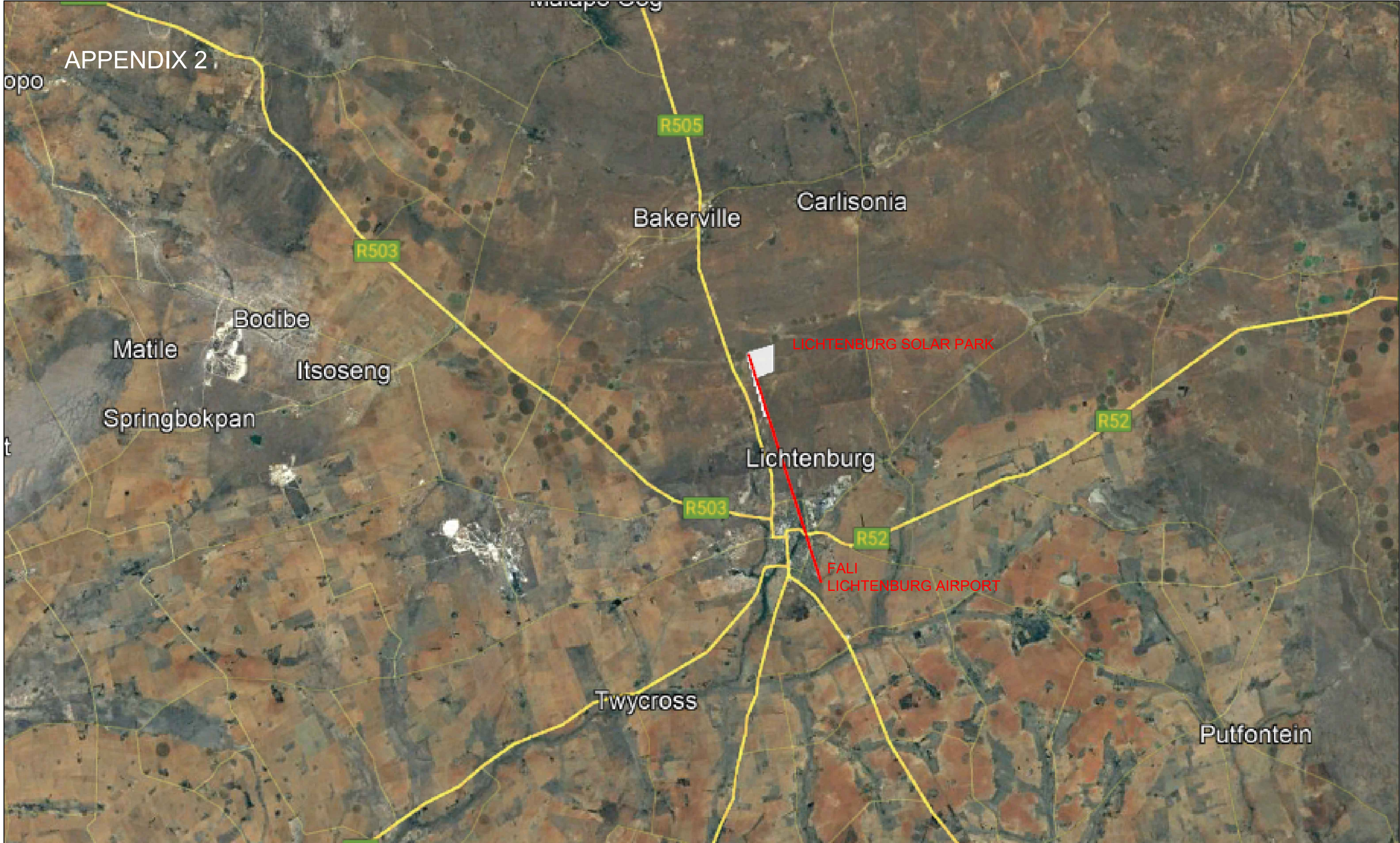
T.P. du Toit

T.P. du Toit



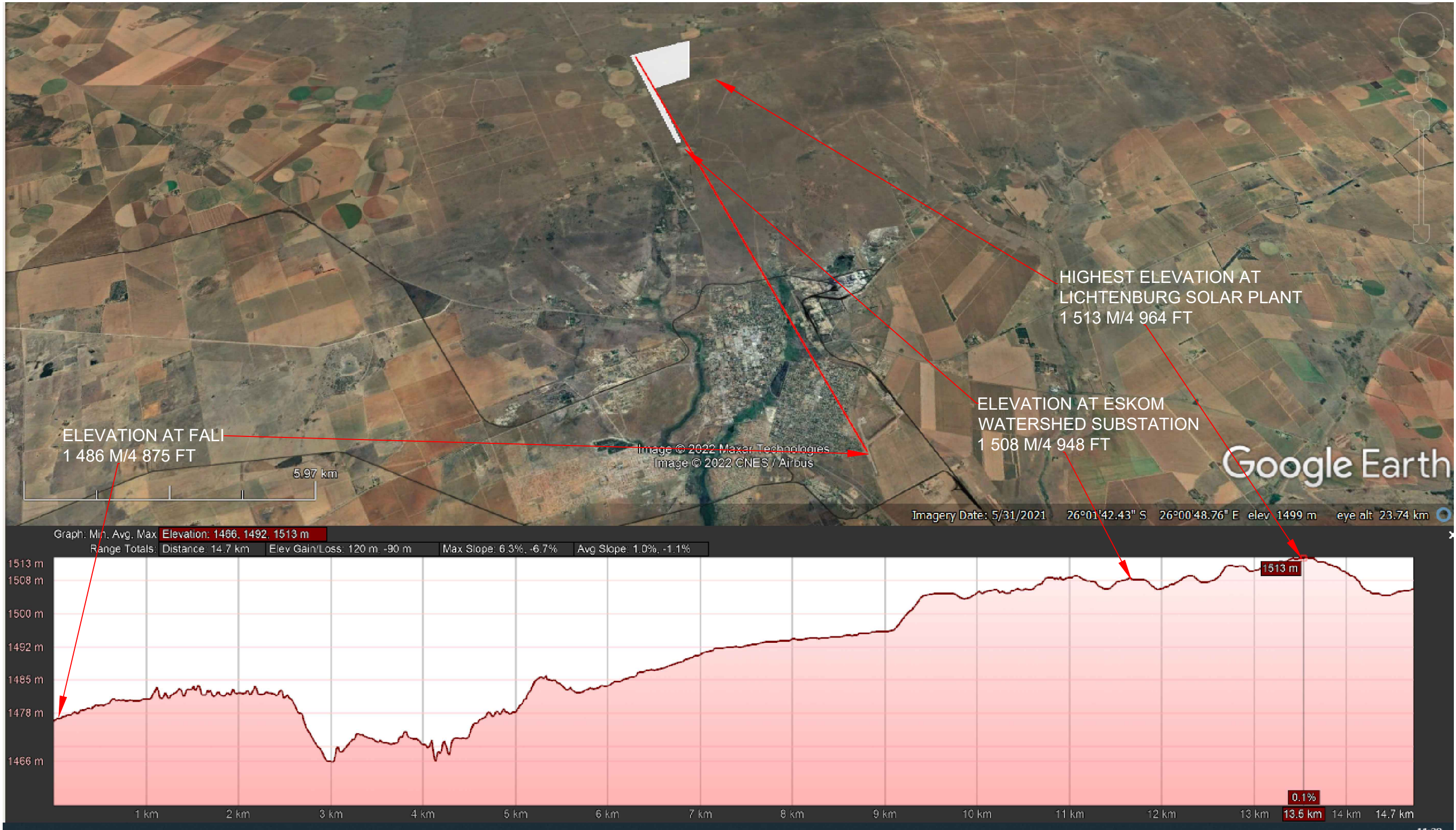
APPENDIX 1





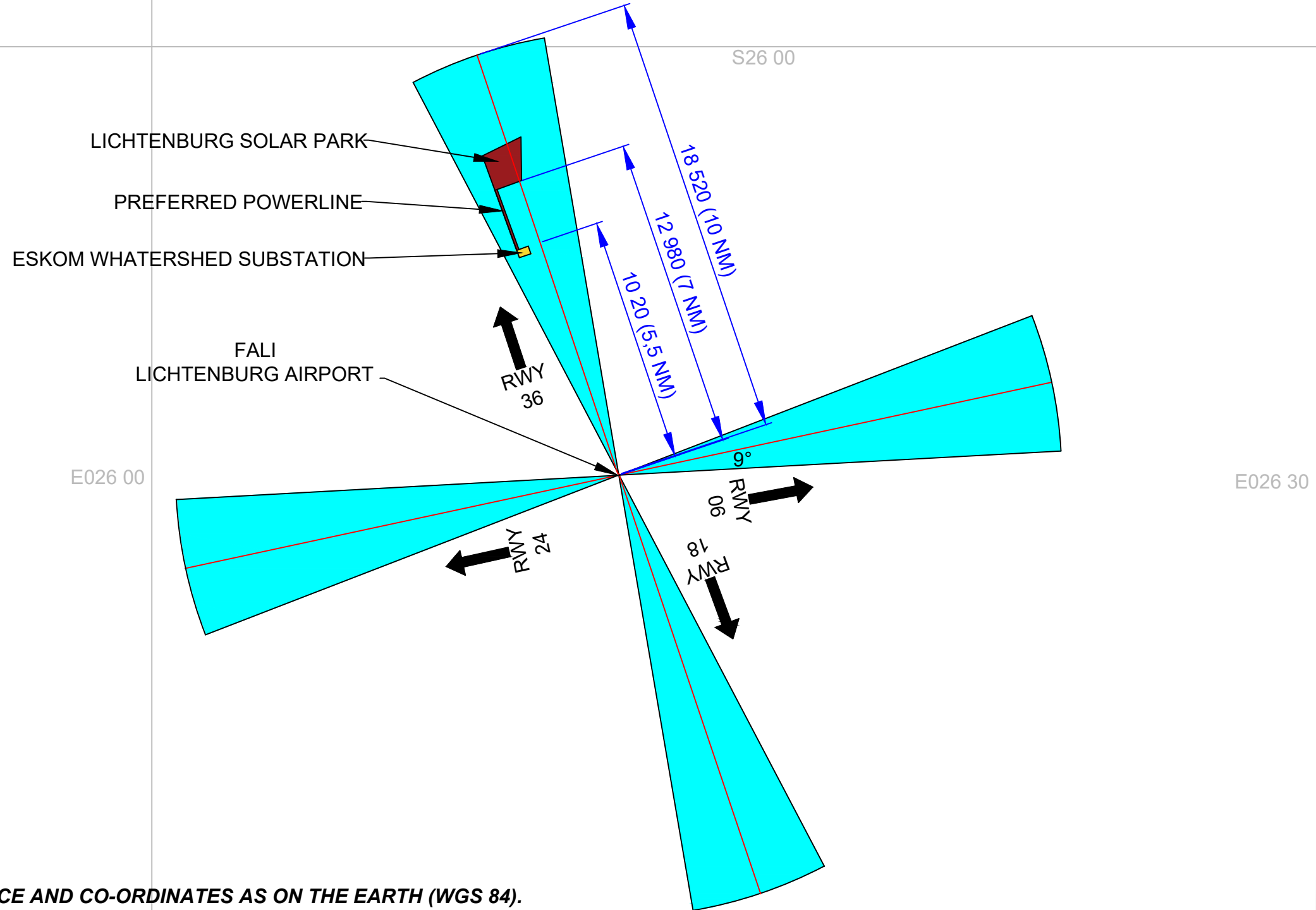
AGES PROJECT L22 026 E	LICHTENBURG PV SOLAR PARK & POWER LINE PROJECT TAC/AGES/022 dd 2022/04/29	NOTES: ORIENTATION MAP	SCALE: 30:1 TAC TP DU TOIT
---------------------------	---	------------------------	----------------------------------

APPENDIX 3

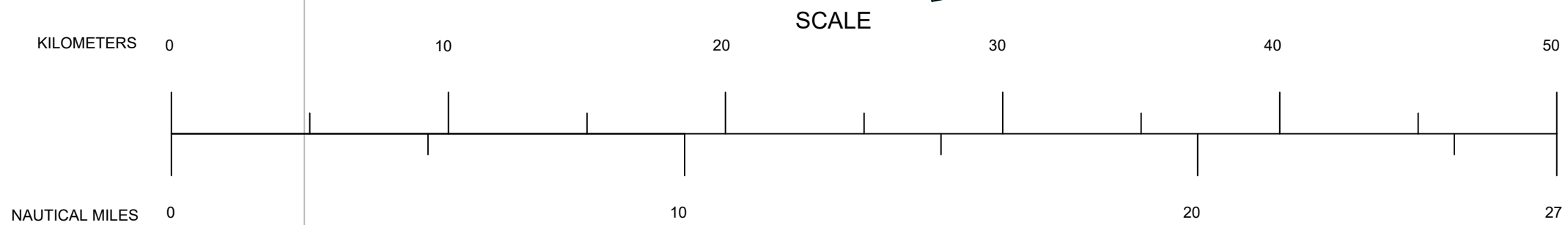


APPENDIX 4

PLANVIEW OF FLIGHT PATHS OF RUNWAYS FROM LICHTENBURG AIRPORT



DISTANCE AND CO-ORDINATES AS ON THE EARTH (WGS 84).

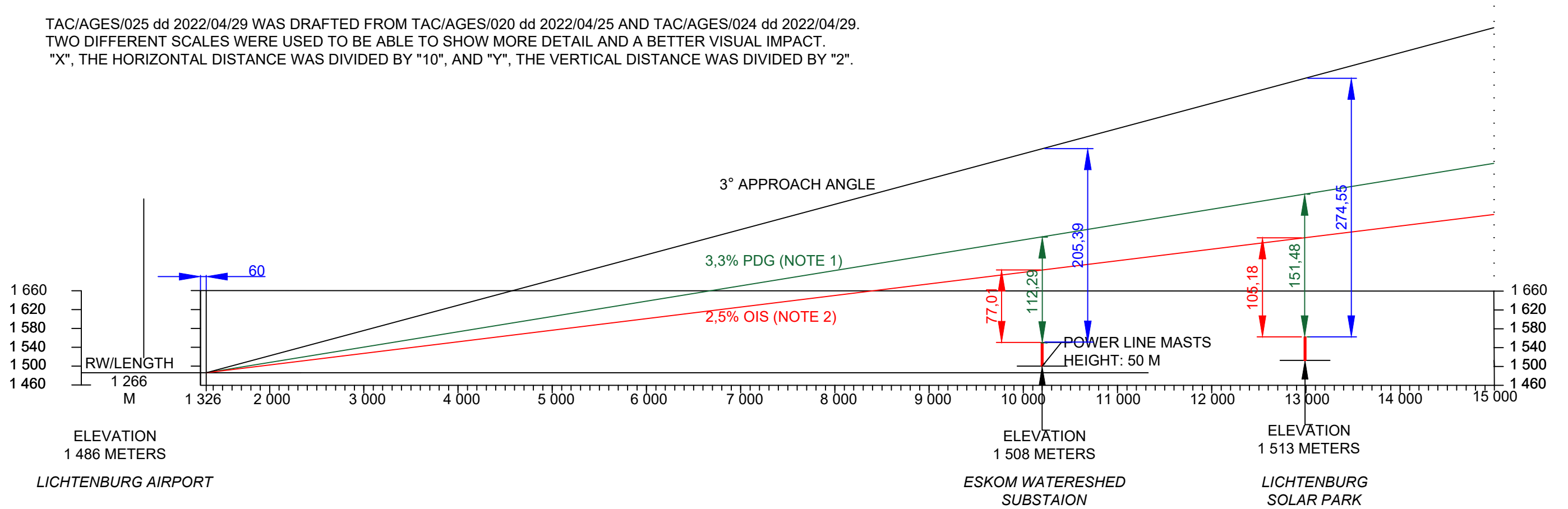


SIDEVIEW OF FLIGHT PATH RUNWAY 36 FROM LICHTENBURG AIRPORT

DIMENSIONS AND ELEVATIONS IN METERS

DISTANCE AND CO-ORDINATES AS ON THE EARTH (WGS 84).

TAC/AGES/025 dd 2022/04/29 WAS DRAFTED FROM TAC/AGES/020 dd 2022/04/25 AND TAC/AGES/024 dd 2022/04/29.
 TWO DIFFERENT SCALES WERE USED TO BE ABLE TO SHOW MORE DETAIL AND A BETTER VISUAL IMPACT.
 "X", THE HORIZONTAL DISTANCE WAS DIVIDED BY "10", AND "Y", THE VERTICAL DISTANCE WAS DIVIDED BY "2".



NOTE 1; 3.3% PDG (PRODUCE DESIGN GRADIENT). UNLESS OTHERWISE PUBLISHED, A PDG OF 3.3% IS ASSUMED.

NOTE 2: OIS (OBSTACLE IDENTIFICATION SURFACE). OIS STARTS AT A 2,5% GRADIENT.

PROPOSED SOLAR PARK AND POWER LINE CONSTRUCTIONS DO NOT INTERFERE WITH THE OBSTACLE LIMIT SURFACES OF LICHTENBURG AIRPORT.

AGES PROJECT L22 026 E	LICHTENBURG PV SOLAR PLANT & POWER LINE PROJECT- TAC/AGES/025 dd 2022/04/29	REFERENCES: ICAO ANNEX 14 VOLUME 1, AERODROME DESIGN AN OPERATIONS. ICAO PANS OPS VOLUME 1 & 2 SACAA REGULATIONS, TECHNICAL STANDARDS & AIP	PUBLISHED IN GOVERNMENT NOTICE NO: 320, GOVERNMENT GAZETTE 43110 dd 20 MARCH 2010 (PROTOCOL FOR THE SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS FOR ENVIRONMENTAL IMPACTS ON CIVIL & MILITARY INSTALLATIONS)	SCALE: 1:4.5 TAC TP DU TOIT
---------------------------	---	---	---	-----------------------------------