Appendix H.11

VISUAL ASSESSMENT

Public

PROPOSED KOMATI POWER STATION SOLAR PHOTOVOLTAIC (PV) AND BATTERY ENERGY STORAGE SYSTEM (BESS), MPUMALANGA PROVINCE

VISUAL IMPACT ASSESSMENT

Produced for:

Eskom Holdings SOC (Ltd)

On behalf of:

WSP Group Africa (Pty) Ltd

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- MAY 2023 -

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DECLARATION

I, **Lourens du Plessis**, as an independent consultant who compiled this Visual Impact Assessment, declare that it correctly reflects the findings made at the time of the report's compilation. I further declare that I, act as an independent consultant in terms of the following:

- Do not have any financial interest in the undertaking of the activity, other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act107 of 1998);
- Undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act,1998 (Act 107 of 1998);
- Based on information provided to me by the project proponent, and in addition to information obtained during the course of this study, will present the results and conclusion within the associated document to the best of my professional judgement.

____

Lourens du Plessis
Professional GISc Practitioner

1. STUDY APPROACH

1.1. Qualification and experience of the practitioner

Lourens du Plessis (t/a LOGIS) is a Professional Geographical Information Sciences (GISc) Practitioner registered with The South African Geomatics Council (SAGC), and specialises in Environmental GIS and Visual Impact Assessments (VIA).

Lourens has been involved in the application of Geographical Information Systems (GIS) in Environmental Planning and Management since 1990. He has extensive practical knowledge in spatial analysis, environmental modelling, and digital mapping, and applies this knowledge in various scientific fields and disciplines. His GIS expertise are often utilised in Environmental Impact Assessments, Environmental Management Frameworks, State of the Environment Reports, Environmental Management Plans, tourism development and environmental awareness projects.

He holds a BA degree in Geography and Anthropology from the University of Pretoria and worked at the GisLAB (Department of Landscape Architecture) from 1990 to 1997. He later became a member of the GisLAB and in 1997, when Q-Data Consulting acquired the GisLAB, worked for GIS Business Solutions for two years as project manager and senior consultant. In 1999 he joined MetroGIS (Pty) Ltd as director and equal partner until December 2015. From January 2016 he worked for SMEC South Africa (Pty) Ltd as a technical specialist until he went independent and began trading as LOGIS in April 2017.

Lourens has received various awards for his work over the past two decades, including EPPIC Awards for ENPAT, a Q-Data Consulting Performance Award and two ESRI (Environmental Systems Research Institute) awards for Most Analytical and Best Cartographic Maps, at Annual International ESRI User Conferences. He is a co-author of the ENPAT atlas and has had several of his maps published in various tourism, educational and environmental publications.

He is familiar with the "Guidelines for Involving Visual and Aesthetic Specialists in EIA Processes" (Provincial Government of the Western Cape: Department of Environmental Affairs and Development Planning) and utilises the principles and recommendations stated therein to successfully undertake visual impact assessments.

1.2. Information Base

This assessment was based on information from the following sources:

- Topographical maps and GIS generated data were sourced from the Surveyor General, Surveys and Mapping in Mowbray, Cape Town;
- Chief Directorate National (CDN) Geo-Spatial Information, varying dates. *1:50 000 Topographical Maps and Data.*
- DFFE, 2018/2020. *National Land-cover Database 2018/2020 (NLC2018/2020).*
- DFFE, 2022. *South African Protected Areas Database (SAPAD_OR_2022_Q2).*
- JAXA, 2021. Earth Observation Research Centre. *ALOS Global Digital Surface Model (AW3D30).*
- Google Earth Pro. *Up to date and recent satellite images.*
- Professional judgement based on experience gained from similar projects;
- Literature research on similar projects;
- Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of NEMA

Quality of the above information bases are rated as Good.

1.3. Assumptions and limitations

To prepare this Report, LoGis utilised only the documents and information provided by WSP or any third parties directed to provide information and documents by WSP. LoGis has not consulted any other documents or information in relation to this Report, except where otherwise indicated. The findings, recommendations and conclusions given in this report are based on the author’s best scientific and professional knowledge, as well as, the available information.

This report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken. LoGis and its staff reserve the right to modify aspects of the report including the recommendations if and when new information may become available from on-going research or further work in this field, or pertaining to this investigation.

This assessment was undertaken during the planning stage of the project and is based on information available at that time. It is assumed that all information regarding the project details provided by WSP and the Applicant is correct and relevant to the proposed project. This Visual Impact Assessment and all associated mapping has been undertaken according to the worst-case scenario with the layout provided.

1.4. Legal framework

The following legislation and guidelines have been considered in the preparation of this report:

- **The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA):** This report is in line with Appendix 6 of NEMA: Environmental Impact Assessment (EIA) Regulations (2014, as amended) which details the minimum requirements a specialist report must contain for an Environmental Impact Assessment.
- **Guideline for Involving Visual and Aesthetic Specialists in EIA Processes (DEADP, Provincial Government of the Western Cape, 2005):** This guideline was developed for use in the Western Cape, however in the absence of the development of any other guideline, this provides input for the preparation of visual specialist input into EIA processes. The guideline documents the requirements for visual impact assessment, typical issues that trigger the need for specialist visual input, the scope and extent of a visual assessment, information required, as well as the assessment ad reporting of visual impacts and management actions.
- **Screening Tool as per Regulation 16 (1)(v) of the Environmental Impact Assessment Regulations, 2014 as amended:** a Screening report was generated for this proposed project, whereby a visual impact assessment was identified as one of the specialist studies that would be required.

1.5. Level of confidence

Level of confidence[1] is determined as a function of:

- The information available, and understanding of the study area by the practitioner:
  - **3**: A high level of information is available of the study area and a thorough knowledge base could be established during site visits, surveys etc. The study area was readily accessible.
  - **2**: A moderate level of information is available of the study area and a moderate knowledge base could be established during site visits, surveys etc. Accessibility to the study area was acceptable for the level of assessment.
  - **1**: Limited information is available of the study area and a poor knowledge base could be established during site visits and/or surveys, or no site visit and/or surveys were carried out.

- The information available, understanding of the project and experience of this type of project by the practitioner:
  - **3**: A high level of information and knowledge is available of the project and the visual impact assessor is well experienced in this type of project and level of assessment.
  - **2**: A moderate level of information and knowledge is available of the project and the visual impact assessor is moderately experienced in this type of project and level of assessment.

[1] Adapted from Oberholzer (2005).

- **1**: Limited information and knowledge is available of the project and the visual impact assessor has a low experience level in this type of project and level of assessment.

These values are applied as follows:

Table 1: Level of confidence

	Information on the project & experience of the practitioner			
Information on the study area		**3**	**2**	**1**
	3	9	6	3
	2	6	4	2
	1	3	2	1

The level of confidence for this assessment is determined to be **9** and indicates that the author's confidence in the accuracy of the findings is Moderate to High:

- The information available, and understanding of the study area by the practitioner is rated as **3**
- The information available, understanding and experience of this type of project by the practitioner is rated as **3**

1.6. EIA Requirements for Specialist Reports

Appendix 6 of the 2014 NEMA EIA Regulations, as amended, stipulates and prescribes the content of the Specialist Reports. Table 2 below details these requirements and refers the reader to relevant pages where specific information can be found for ease of reference:

Table 2: EIA Specialist requirements

EIA Regulations, 2014 Requirements, as amended	Page Reference
(a) Details of-	
(i) The specialist who prepared the report	Section 1.1
(ii) Expertise of that specialist to compile a specialist report including a CV	Section 1.1. and Appendix A
(b) Declaration that the specialist is independent in a form as may be specified by the competent authority	Page iii
(c) An indication of the scope of, and purpose for which, the report was prepared	Section 3
(cA) an indication of the quality and age of base data used for the specialist report	Section 1.2
(cB) a description of the existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change	Section 4, Section 6 and Section 8
(d) The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 1.7
(e) A description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Section 1.7
(f) Details of an assessment of the specific identified sensitivity of the site related	Section 5

to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternative	
(g) An identification of any areas to be avoided, including buffers	Section 5
(h) A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers	Page 32, Map 7
(i) A description of any assumptions made and any uncertainties or gaps in knowledge	Section 1.3
(j) A description of the findings and potential implications of such findings on the impact of the proposed activity or activities	Section 6
(k) Any mitigation measures for inclusion in the EMPr	Section 6.5
(l) Any conditions for inclusion in the EA	Section 6.5
(m) Any monitoring requirements for inclusion in the EMPr or EA	Section 9
(n) A reasoned opinion-	
(i) Whether the proposed activity or portions thereof should be authorized	Section 7 and 8
(iA) regarding the acceptability of the proposed activity	
(ii) If the opinion is that the proposed activity or portions thereof should be authorized, any avoidance, management and mitigation measures that should be included in the EMPr and where applicable, the closure plan	Section 6.5 and Section 9
(o) A description of any consultation process that was undertaken during the course of preparing the specialist report	N/A
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto	N/A
(q) Any other information requested by the competent authority	N/A

1.7. Methodology

The study was undertaken using Geographical Information Systems (GIS) software as a tool to generate viewshed analyses and to apply relevant spatial criteria to the proposed facility. A detailed Digital Terrain Model (DTM) for the study area was created from topographical data provided by the Japan Aerospace Exploration Agency (JAXA), Earth Observation Research Centre, in the form of the ALOS Global Digital Surface Model "ALOS World 3D - 30m" (AW3D30) elevation model.

Visual Impact Assessment (VIA)

The VIA will be determined according to the nature, extent, duration, intensity or magnitude, probability and significance of the potential visual impacts, and will propose management actions and/or monitoring programs, and may include recommendations related to the facility layout/position.

The visual impact will be determined for the highest impact-operating scenario (worst-case scenario) and varying climatic conditions (i.e. different seasons, weather conditions, etc.) will not be considered.

The VIA will consider potential cumulative visual impacts, or alternatively the potential to concentrate visual exposure/impact within the region (if applicable).

The following VIA-specific tasks have been undertaken:

- **Determine potential visual exposure**

The visibility or visual exposure of any structure or activity is the point of departure for the visual impact assessment. It stands to reason that if (or where) the proposed facility and associated infrastructure were not visible, no impact would occur.

The viewshed analyses of the proposed facility and the related infrastructure are based on a 30m SRTM digital terrain model of the study area.

The first step in determining the visual impact of the proposed facility is to identify the areas from which the structures would be visible. The type of structures, the dimensions, the extent of operations and their support infrastructure are taken into account.

- **Determine visual distance/observer proximity to the facility**

In order to refine the visual exposure of the facility on surrounding areas/receptors, the principle of reduced impact over distance is applied in order to determine the core area of visual influence for this type of structure.

Proximity radii for the proposed infrastructure are created in order to indicate the scale and viewing distance of the facility and to determine the prominence of the structures in relation to their environment.

The visual distance theory and the observer's proximity to the facility are closely related, and especially relevant, when considered from areas with a high viewer incidence and a predominantly negative visual perception of the proposed facility.

- **Determine viewer incidence/viewer perception (sensitive visual receptors)**

The next layer of information is the identification of areas of high viewer incidence (i.e. main roads, residential areas, settlements, etc.) that would be exposed to the project infrastructure.

This is done in order to focus the attention on areas where the perceived visual impact of the facility will be the highest and where the perception of affected observers will be negative.

Related to this dataset, is a land use character map, that further aids in identifying sensitive areas and possible critical features (i.e. tourist facilities, national parks, etc. – if applicable), that should be addressed.

- **Determine the visual absorption capacity (VAC) of the landscape**

This is the capacity of the receiving environment to absorb the potential visual impact of the proposed facility. The VAC is primarily a function of the vegetation, and will be high if the vegetation is tall, dense and continuous. Conversely, low growing sparse and patchy vegetation will have a low VAC.

The VAC would also be high where the environment can readily absorb the structure in terms of texture, colour, form and light / shade characteristics of the structure. On the other hand, the VAC for a structure contrasting markedly with one or more of the characteristics of the environment would be low.

The VAC also generally increases with distance, where discernible detail in visual characteristics of both environment and structure decreases.

- **Calculate the visual impact index**

The results of the above analyses are merged in order to determine the areas of likely visual impact and where the viewer perception would be negative. An area with short distance visual exposure to the proposed infrastructure, a high viewer incidence and a predominantly negative perception would therefore have a higher value (greater impact) on the index. This focusses the attention to the critical areas of potential impact and determines the potential **magnitude** of the visual impact.

Geographical Information Systems (GIS) software will be used to perform all the analyses and to overlay relevant geographical data sets in order to generate a visual impact index.

- **Determine impact significance**

The potential visual impacts are quantified in their respective geographical locations in order to determine the significance of the anticipated impact on identified receptors. Significance is determined as a function of extent, duration, magnitude (derived from the visual impact index) and probability. Potential cumulative and residual visual impacts are also addressed. The results of this section are displayed in impact tables and summarised in an impact statement.

- **Propose mitigation measures**

The preferred alternative (or a possible permutation of the alternatives) will be based on its potential to reduce the visual impact. Additional general mitigation measures will be proposed in terms of the planning, construction, operation and decommissioning phases of the project.

- **Reporting and map display**

All the data categories, used to calculate the visual impact index, and the results of the analyses will be displayed as maps in the accompanying report. The methodology of the analyses, the results of the visual impact assessment and the conclusion of the assessment will be addressed in this VIA report.

- **Site visit**

A site visit was undertaken on the 03 May 2023 for a full day in order to verify the results of the spatial analyses and to identify any additional site-specific issues that may need to be addressed in the VIA report. It should be noted that, from a visual perspective, the different seasons do not influence the results of the impact assessment, and as such regardless of the timing of the site visit, the level of confidence for the assessment and findings is high.

2. PROJECT DESCRIPTION

Eskom Holdings SOC (Ltd) (Eskom) is a South African utility that generates, transmits, and distributes electricity and supplies approximately 95% of the country's electricity. Eskom's 2035 strategy encompasses the journey that Eskom intends to take in response to the changing energy environment and the impact this has towards a sustainable power utility. This strategy is necessitated by the challenges that Eskom faces as a business as well as the global and local shifts occurring in the energy sector particularly with respect to environmental and climate change challenges, difficulties in accessing financing and changes to the macro industry environment significantly altering the energy supply industry. The road to 2035, includes the shutting down of a number of coal-fired power stations, repurposing and repowering, delivering new clean generation projects, expanding the Transmission grid, and rolling out micro grid solutions.

Several power stations are reaching the end-of-life. These stations will go into extended cold reserve and are most likely to be fully decommissioned in the future. Eskom is considering a shutdown, dismantling, and repurposing of some of its fleet as it reaches its end-of-life. Komati Power Station, located near Middelburg in the Mpumalanga Province, reached its end-of-life in

September 2022. Eskom has developed a Just Energy Transition Project (EJETP) aimed at mitigating the negative social impacts resulting from the shutting down of the plant and to implement projects for the repowering and repurposing related to the Komati Power Station. This is one of several initiatives in which Eskom proposes to establish a solar energy generating facility which will include the installation of a 100 MW SEF as well as 150MW BESS facilities.

The proposed project will comprise the following key components:

- Solar Energy Facility;
- Grid Connection (i.e. powerlines);
- Site Substation and BESS; and
- Associated infrastructure.

These items are summarised in **Table 3** and discussed in more detail below. The project infrastructure is located in **Figure 1**. The SEF is intended to evacuate power to the grid. Part of the design development will be to determine the best option to charge the BESS, either with grid power or power generated from PV.

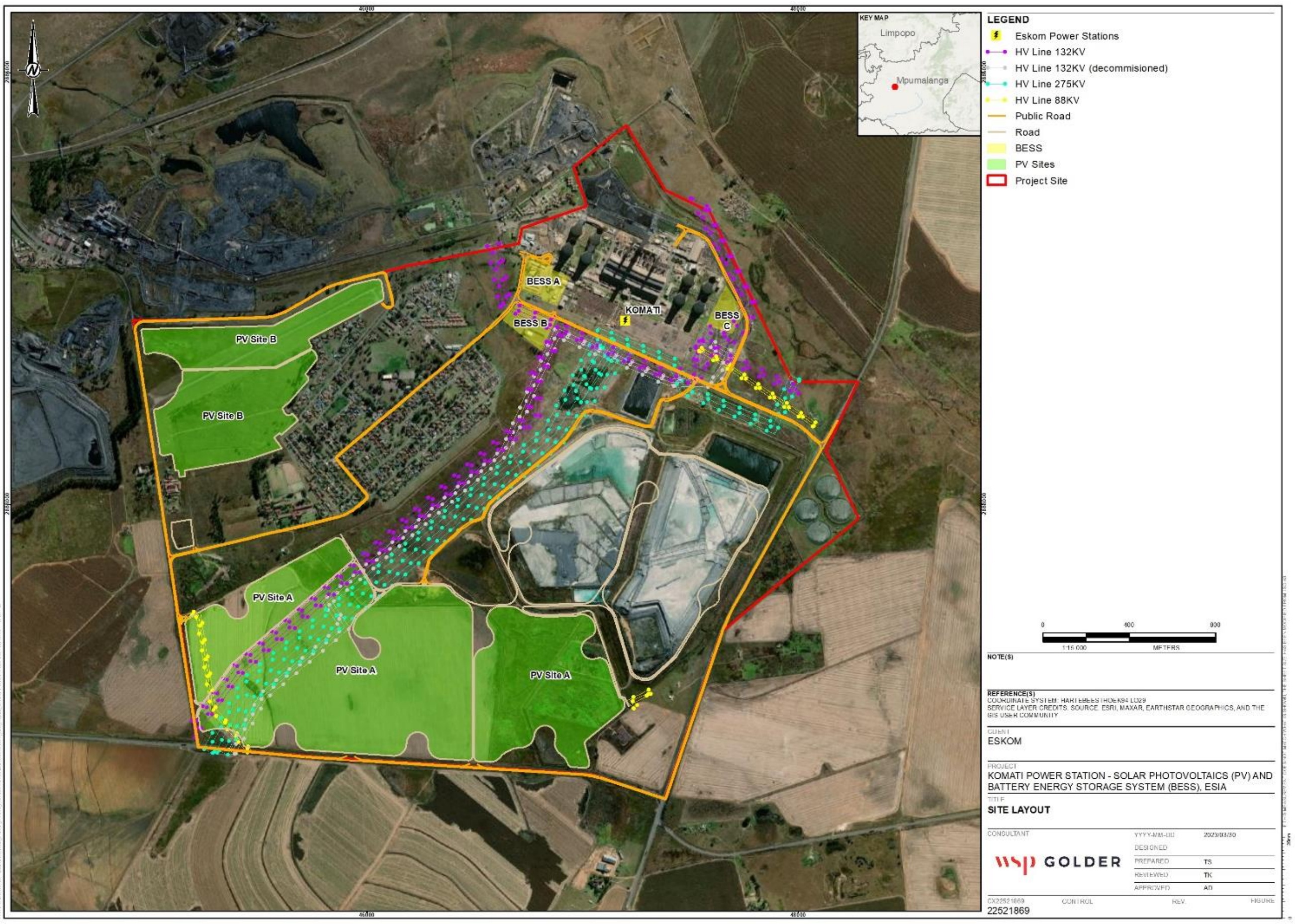


Figure 1: Project Infrastructure

Table 3: Key Project Infrastructure

INFRASTRUCTURE	DESCRIPTION
Solar Energy Facility	— Solar Farm A: — Extent: 156 Ha — Buildable Area: 127 Ha — Capacity: Up to 71.5 MW — Solar Farm B: — Extent: 54 Ha Ha — Buildable Area: 50 Ha — Capacity: Up to 28.5 MW — Solar modules will be elevated above the ground, and will be mounted on either fixed tilt systems or tracking system
Grid Connection (i.e. powerlines)	— Point of connection of Solar Panels will be to the Komati High Voltage (HV) yard. — Power routed via a medium voltage overhead line (OHL) or underground cabling. — Servitude of powerlines: — Between 36 and 40m — Area will be approximately 26ha — Substations: — Each of the Solar Sites will be equipped with collector substations. — Infrastructure associated with the substations includes: — O&M buildings housing the control and communication equipment — Access road infrastructure within the substation sites — Site substations and collector substations — Site Access: — New access roads or tracks may be required to provide access to sections of the powerline route. — Access roads will be mostly a two-track gravel road under the OHPL in order to access pylons for construction and maintenance purposes.
Site Substation and BESS	— Three BESS facilities — Footprints: Range from 2 ha up to 6 ha. — BESS capacity: 150 MW with four hours standby time. — Lithium Battery Technologies, such as Lithium Iron Phosphate, Lithium Nickel Manganese Cobalt oxides or Vanadium Redox flow technologies are being considered
Associated infrastructure	— Access roads; — Perimeter roads; — Below ground electrical cables; — Above ground overhead lines; — Meteorological Station; — Operations and Maintenance (O&M) Building including control room, server room, security equipment room, offices, boardroom, kitchen, and ablution facilities); — Spares Warehouse and Workshop; — Hazardous Chemical Store; — Security Building; — Parking areas and roads; — Temporary laydown areas; — Temporary concrete batching plant — Construction camps and temporary laydown areas; and — Onsite substations.

Solar Energy Facility

The total site area for PV installation is approximately 200-250 hectares to allow for the construction of a PV facility with capacity up to 100 MW. Solar PV modules which convert solar radiation directly into electricity, will occupy a space of up to a total of approximately 720,000 m^2. The solar PV modules will be elevated above the ground, and will be mounted on either fixed tilt systems or tracking systems (comprised of galvanised steel and aluminium). The Solar PV modules will be placed in rows in such a way that there is allowance for a perimeter road and security fencing along the boundaries, and O&M access roads in between the PV module rows. **Table 4**: High-level Project Summary – Renewable Energy Facilities

provides a high-level project summary of the proposed Facilities.

Table 4: High-level Project Summary – Renewable Energy Facilities

	SOLAR PV SITE A	SOLAR PV SITE B
Extent	156 Ha	54 Ha
Buildable Area	127 Ha	50 Ha
Capacity	71.5 MW	28.5 MW

Grid Connection

The Solar Facilities will be allocated a point of connection to the Komati High Voltage (HV) yard. Each of the Solar Sites will be equipped with collector substations that will the route the power output to the point of connection via a medium voltage overhead line (OHL) or underground cabling. The method and final route to the points of connection will form part of the final designs. The existing Komati points of connections will be used with the existing infrastructure to connect to the Komati 275kV HV yard. The existing power evacuation infrastructure consist of step-up transformers (140 megavolt Amperes (MVA)), surge arrestors, transmission lines, HV breakers and links to the 275kV busbar.

Servitude

The registered servitude will likely between 36 and 40m. The length of the transmission will be determined during the design stage. The servitude area will be approximately 26ha. The servitude is required to ensure safe construction, maintenance and operation of the powerline.

Substations

On site substations will be established within the extent of the Solar Site A and Solar Site B. The site itself is very homogenous and there are no significant features in the immediate vicinity of the substation location that might be affected by the development. The following infrastructure is proposed but will be confirmed during the design stage:

- O&M buildings housing the control and communication equipment;
- All the access road infrastructure within the substation sites; and
- Site substations and collector substations to consolidate and distribute power to the connection points.

Site Access

The project area and surrounding areas are already easily accessible due to existing access roads. New access roads or tracks may be required to provide access to sections of the powerline route. Access roads will be mostly a two-track gravel road under the OHPL in order to access pylons for construction and maintenance purposes. The width of the access roads will be determined during the design phase.

BESS.

Eskom proposes to establish three BESS facilities with the existing footprint of the Komati Power Station. The BESS footprints will range from 2 ha up to 6 ha, depending on design and optimisation of the site and technology selected. The BESS capacity is envisaged to be 150 MW with four hours standby time.

It is proposed that Lithium Battery Technologies, such as Lithium Iron Phosphate, Lithium Nickel Manganese Cobalt oxides or Vanadium Redox flow technologies will be considered as the preferred battery technology however the specific technology will only be determined following Engineering, Procurement, and Construction (EPC) procurement. The main components of the BESS include the batteries, power conversion system and transformer which will all be stored in various rows of containers. The BESS components will arrive on site pre-assembled. Error! Reference source not found. shows the approximate middle point coordinates of the BESS facilities.

The specifics of the technology to be used (i.e. brand and country of origin) will be provided in the EIA.

Ancillary Infrastructure

The additional ancillary infrastructure will be confirmed once the Conceptual Design is complete, however, it is anticipated that the following will be applicable:

- Access roads;
- Perimeter roads;
- Below ground electrical cables;
- Above ground overhead lines;
- Meteorological Station;
- Operations and Maintenance (O&M) Building including control room, server room, security equipment room, offices, boardroom, kitchen, and ablution facilities);
- Spares Warehouse and Workshop;
- Hazardous Chemical Store;
- Security Building;
- Parking areas and roads;
- Temporary laydown areas;
- Temporary concrete batching plant
- Construction camps and temporary laydown areas; and
- Onsite substations.

The proposed development sites identified for the Solar PV Energy Facility and associated infrastructure are indicated on the maps within this report. Sample images of similar PV technology and Battery Energy Storage System (BESS) facilities are provided below.

Figure 2: Photovoltaic (PV) solar panels. (Photo: SunPower Solar Power Plant- Prieska)

Figure 3: Aerial view of PV arrays. (Photo: Scatec Solar South Africa)

Figure 4: Aerial view of a BESS (Photo: Power Engineering International)

Figure 5: Close up view of a BESS (Photo: Greenbiz.com)

3. SCOPE OF WORK

This report is the Visual Impact Assessment (VIA) of the proposed **Komati Solar PV and BESS** as described above.

The determination of the potential visual impacts is undertaken in terms of nature, extent, duration, magnitude, probability and significance of the construction and operation of the proposed infrastructure.

The study area for the visual assessment encompasses a geographical area of approximately 220km² (the extent of the full-page maps displayed in this report) and includes a minimum 6km buffer zone (area of potential visual influence) from the proposed project site.

Anticipated issues related to the potential visual impact of the proposed Facility include the following:

- The visibility of the facility to, and potential visual impact on, observers travelling along the national, arterial or secondary roads within the study area.
- The visibility of the facility to, and visual impact on residents of homesteads within the study area.

- The potential visual impact of the facility on the visual character or sense of place of the region.
- The potential visual impact of the facility on tourist routes or tourist destinations (if present).
- The potential visual impact of the construction of ancillary infrastructure (i.e. powerlines, substations, etc.) on observers in close proximity to the facility.
- The visual absorption capacity of the natural vegetation (if applicable).
- The potential cumulative visual impact of the proposed facility and associated infrastructure in context of the other PV facilities within the region.
- The potential visual impact of operational, safety and security lighting of the facility at night on observers residing in close proximity of the facility.
- Potential visual impact of solar glint and glare as a visual distraction and possible air/road travel hazard.
- Potential visual impact of solar glint and glare on static ground-based receptors (residents of homesteads) in close proximity to the PV facility.
- Potential visual impacts associated with the construction phase.
- The potential to mitigate visual impacts and inform the design process.

It is envisaged that the issues listed above may constitute a visual impact at a local and/or regional scale.

4. THE AFFECTED ENVIRONMENT

The Komati Power Station is situated about 37km from Middelburg, 43km from Bethal and 40km from Emalahleni within the Highveld region of the Mpumalanga Province. It falls within the Steve Tshwete Local Municipality of the Nkangala District Municipality. The larger region is considered as the power generation hub of South Africa with extensive coal fields that cover almost all of the area, numerous large coal mines and an additional seven coal-fired power stations located within a 60km radius of the Komati Power Station. These Power Stations are Kusile, Kendal, Duvha, Hendrina, Arnot, Kriel and Matla.

The study area for the VIA is centred on the Komati Power Station and includes a 6km buffer zone (zone of potential visual influence) from the Eskom PV project area. Two PV plant development sites are being considered for the Komati Power Station Solar Facility. Site A is located immediately north of the R542 arterial road, approximately 1.6km south-west of the power station. Site B is located immediately west of the Komati residential area, approximately 1.2km west of the power station. This site includes the Komati airstrip. Both sites are considered for development and they are not considered as alternative developments sites.

Figure 6: Regional locality of the study area.

The BESS development sites are located within the power station property; in very close proximity to the existing power station infrastructure i.e. the core power plant, cooling towers and substations.

Figure 7: General view of the existing Komati Power Station

Topography, hydrology and vegetation

The study area is situated on land that ranges in elevation from approximately 1,530m above sea level (asl) in the south-west of the study area to 1,700m asl in the east. The project site itself is located at an average elevation of approximately 1,626m above sea level. Refer to **Map 1**. The terrain morphological unit identified for the entire study area is described as *flat to undulating plains*. The most prominent elevated topographical units are the ash dumps, slimes dams and mine dumps surrounding the power station and the Goedehoop Colliery located west of the power station.

Figure 8: Typical topography of the surrounding area with the Komati Power Station in the background

There are two perennial rivers in the study area, the Koringspruit River (traversing north of the project site) and the Olifants River to the far south-west. Besides these rivers there are a number of non-perennial rivers or streams feeding into the previously mentioned rivers. The study area is characterised by flat or gently undulating terrain, grasslands and has a tropical or subtropical climate. This area also contains pans. A pan is defined as a large, shallow, flat-floored depression found in arid and semi-arid regions and may be flooded seasonally or permanently. There are also a number of man-made dams either related to the agricultural or mining activities of the region.

Figure 9: Example of grassland vegetation and waterbodies found scattered throughout the general study area

The vegetation type for the entire study area is *Eastern Highveld Grassland* within the *Mesic Highveld Grassland Bioregion* of the *Grassland Biome*. It should be noted that most of the natural grassland has been transformed by either agricultural or mining activities. Wetlands occur along the rivers and drainage lines mentioned above. Other than the natural grassland and wetlands there are very limited additional land cover types, such as woodland in places. There are also very limited exotic plantations. These planted trees are generally associated with farm residences or homesteads throughout the region. Refer to **Map 2** for the land cover types and broad land use patterns.

Land use and settlement patterns

The majority of the study area is relatively sparsely populated with a population density of less than approximately 33 people per km^2. Most of these people are located within the towns of Komati (at the power station) or at Blinkpan just north of the Goedehoop Colliery. Other than these towns, or residential areas, the rest of the study area is dotted with farm residences or homesteads. These residences are inhabited by the farmers producing mainly maize crops (dryland agriculture) within the region. Besides the agricultural activities the most prominent land use within the area is the mining and the associated power generation activities at the power station.

Figure 10: The town of Komati located adjacent to the proposed sites

Figure 11: The town of Blinkpan just north of the Goedehoop Colliery

Figure 12: View over the Goedehoop Colliery

Some of the homesteads within the study area include[2]:

- Rooiblom
- Welverdiend (1, 2 and 3)
- Broodsnyersplaas
- Blinkpan
- Geluk
- Bultfontein (1 – 8)
- Willmansrust
- Goedehoop (1, 2 and 3)
- Koornfontein

It is uncertain whether all of these farmsteads are inhabited or not. It stands to reason that farmsteads that are not currently inhabited will not be visually impacted upon at present. These farmsteads do, however retain the potential to be affected visually should they ever become inhabited again in the future. For this reason, the author of this document operates under the assumption that they are all inhabited.

Figure 13: Example of a typical homestead located within the study area

The R35 and R542 arterial roads provide motorised access to the project site from respectively the N4 and N12 national roads traversing north and north-west of the larger region.

Figure 14: View from the R542 towards the site from the west

There are no identified tourist attractions of designated protected areas within the study area.[3]

[2] The names listed below are of the homestead or farm dwelling as indicated on the SA 1: 50 000 topographical maps and do not refer to the registered farm name.
[3] Sources: DEAT (ENPAT Mpumalanga), NBI (Vegetation Map of South Africa, Lesotho and Swaziland), NLC2018 (ARC/CSIR), REEA_OR_2021_Q1 and SAPAD2021 (DFFE).

Figure 15: View from the R35 towards the site from the south

In spite of the overall rural character of the region, there are a large number of power lines and substations in the study area, mostly associated with the Komati Power Station, the coal mines and the railway lines traversing the study area. These include:

- Camden-Duvha 400kV
- Komati-Matla 275kV
- Arnot-Kruispunt 275kV
- Camden-Komati 275kV
- Komati-Kruispunt 275kV
- Halfgewonnen-Kudu 88kV
- Kudu-Export 132kV
- Broodsnyersplaas-Spoornet 132kV
- Aberdeen-Gloria Colliery 132kV
- Export-Duvha Colliery 132kV
- Kudu-Nasarete 132kV
- Hendrina-Aberdeen 132kV
- Aberdeen-Kudu 132kV
- Aberdeen-Ysterkop 132kV
- Duvha Colliery-Kudu 132kV
- Abina 132kV Overhead Line
- Kudu-Dorstfontein 88kV
- Komati-Kudu 1 and 2 132kV
- Aberdeen-Spoornet 132kV
- Klicoal-Kudu 132kV
- Aberdeen-Gloria Shaft 132kV

Figure 16: Existing power line infrastructure within the study area

Figure 17: Railway infrastructure used to transport coal in the region

Figure 18: Typical land use within the study area includes agriculture and mining activities

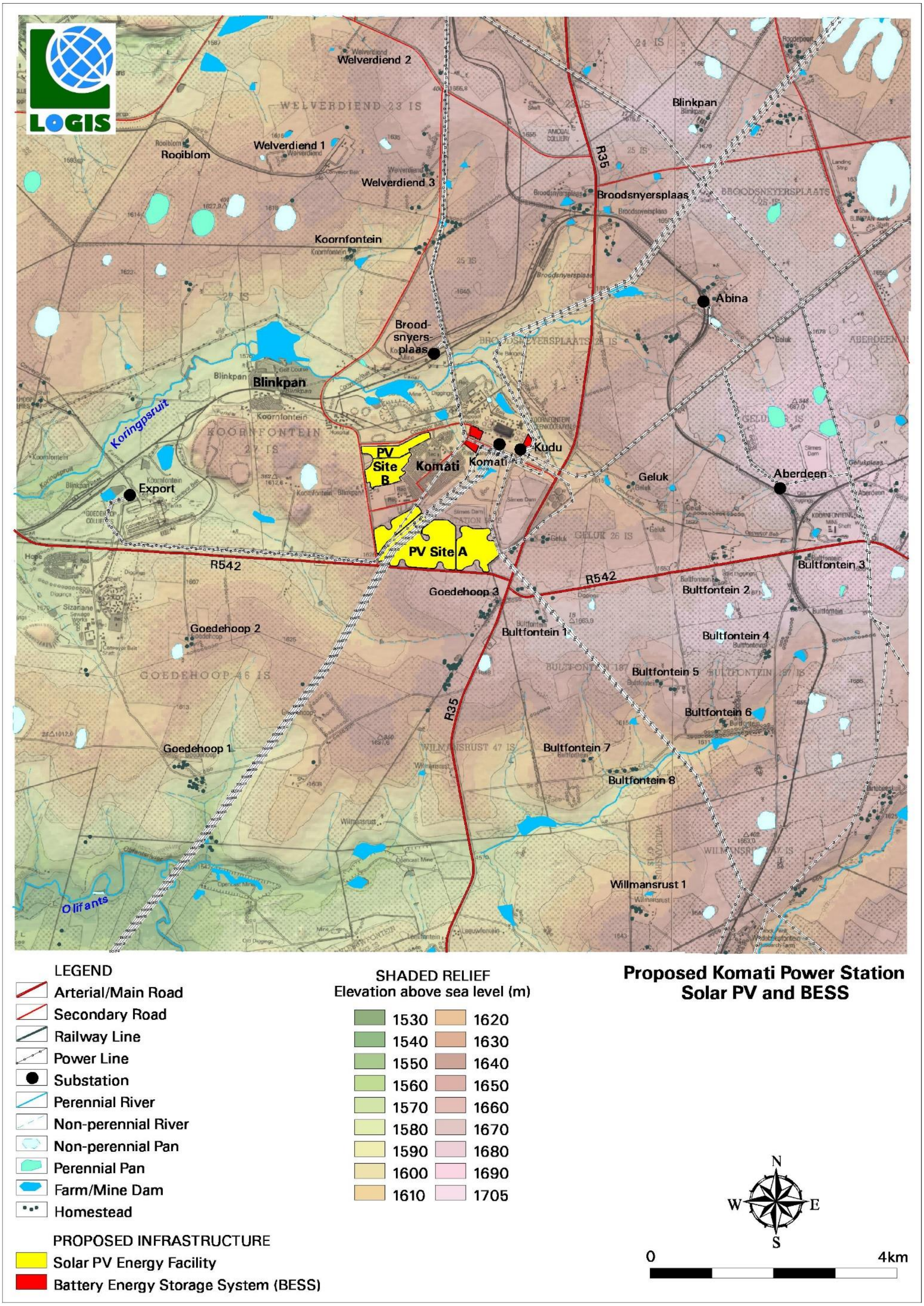
There are no additional solar energy generation plants (or applications) within the study area (as seen in the extent of the maps below). The closest approved application is the proposed installation of a solar photovoltaic power plant at the Eskom Duvha Power Station, some 18km north-west of the project site.

Figure 19: View over PV Site A from the R542

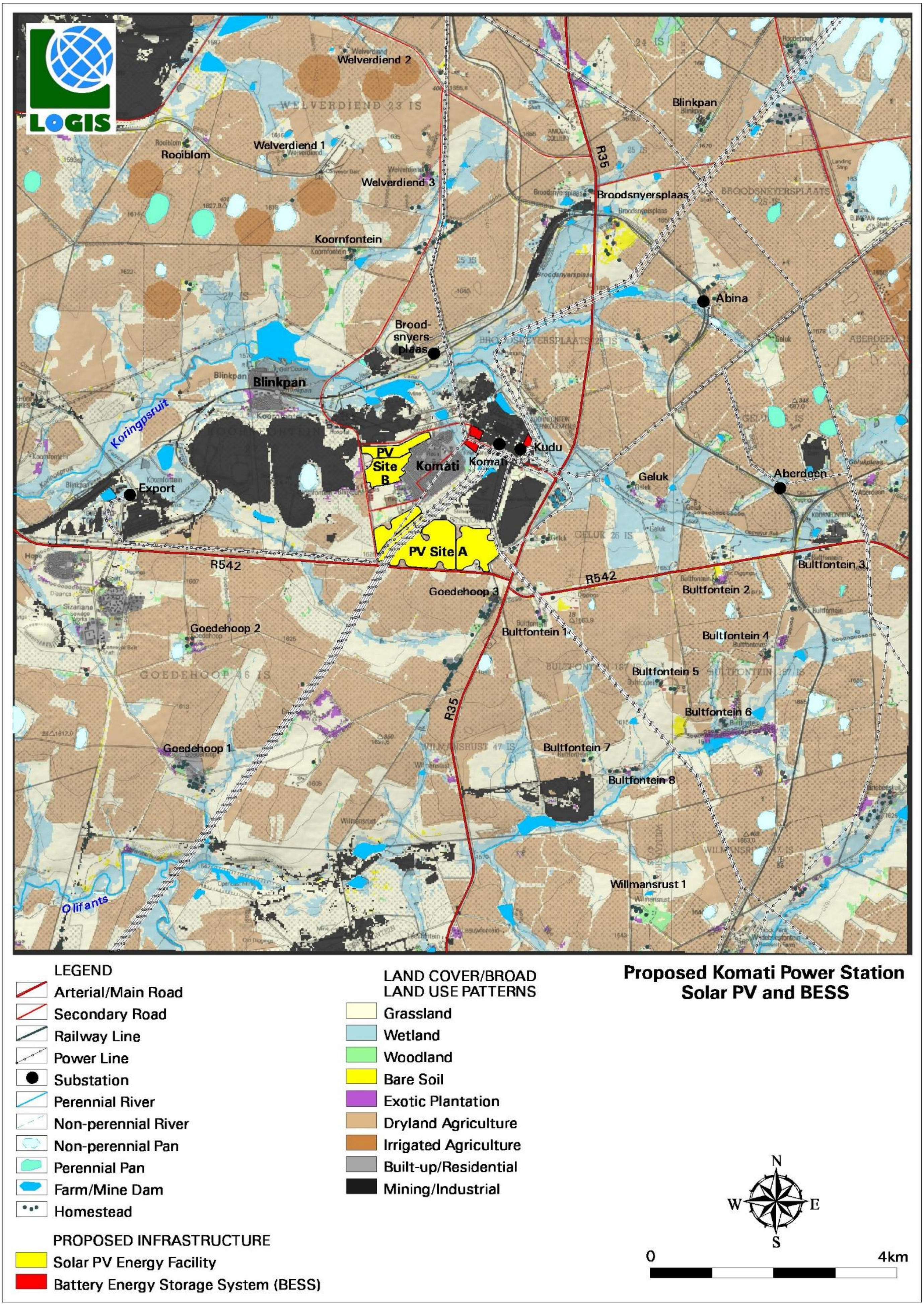
Figure 20: View over PV Site A from the outskirts of the town of Komati

Figure 21: View over PV Site B from the adjacent secondary road

Figure 22: Airstrip noted within PV Site B



Map 1: Shaded relief map of the study area



Map 2: Land cover/ broad land uses patterns

5. RESULTS

5.1. Site Sensitivity Verification

In accordance with GN 320 and GN 1150 (20 March 2020) of the NEMA EIA Regulations of 2014 (as amended), prior to commencing with a specialist assessment, a site sensitivity verification must be undertaken to confirm the current land use and environmental sensitivity of the proposed project areas as identified by the National Web-Based Environmental Screening Tool (i.e., Screening Tool).

A screening report was compiled using the Department of Forestry, Fisheries and the Environment (DFFE) Screening Tool based on the assessed area for all the solar PV facilities and BESS. The Screening Report includes a 'Map of Relative Landscape (Solar) Theme Sensitivity', indicated in **Figure 23** below.

The Screening Tool shows that the site for the proposed Komati Solar PV and BESS facility contains sensitivities ranging from medium to very high owing to the fact that the site is located between 500 - 1000m of a town or village, between a and 2km of a town or village, within 500m of a town or village and located on mountain tops and high ridges.

The current visual sensitivity mapping undertaken in this VIA is in greater detail at the site scale for the proposed solar PV facilities and BESS infrastructure, and takes into account detailed viewshed mapping and local site conditions**.**

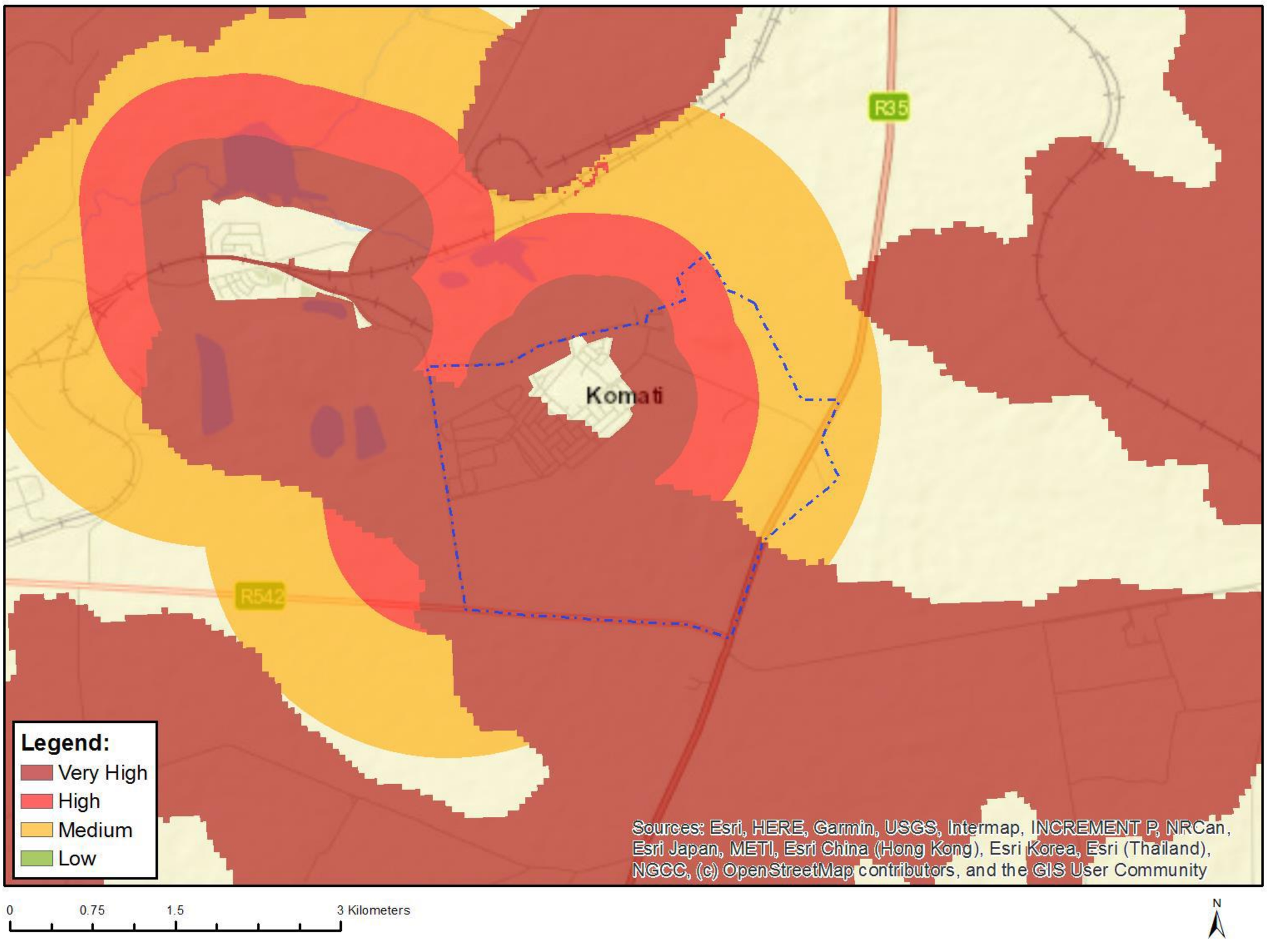


Figure 23: Relative landscape (solar) theme sensitivity as per the DFFE Screening Tool for the proposed Komati Solar PV and BESS Facility

In order to determine the overall visual sensitivity of the proposed sites in the absence of any mitigation, the following matrix was utilized:

Table 5: Matrix to determine overall visual sensitivity for the proposed Komati Solar PV and BESS Facility

	Sensitive Receptor	Very High Sensitivity (4)	High Sensitivity (3)	Moderate Sensitivity (2)	Low Sensitivity (1)
1.	**Topographic features incl mountain ridges**	Within 250m	Within 250-500m	Within 500m – 1km	>1km
2.	**Steep slopes**	Slopes with more than 1:4	Slopes between 1:4 and 1:10	-	-
3.	**Major rivers, water bodies, perennial rivers and wetlands with scenic value**	Within 250m	Within 250-500m	Within 500m – 1km	>1km
4.	**Coastal zone**	Within 1km	Within 1-2km	Within 2-3km	>3km
5.	**Protected area: National Parks**	Within 2km	Within 2-4km	Within 4-6km	>6km
6.	**Protected areas: Nature Reserves**	Within 1km	Within 1-2km	Within 2-3km	>3km
7.	**Private reserves and game farms**	Within 500m	Within 500m - 1km	Within 1-2km	>2km
8.	**Cultural landscape**	On the site itself	Within 500m	Within 500m – 1km	>1km
9.	**Heritage Sites Grades I, ii and iii**	On the site itself	Within 500m	Within 500m – 1km	>1km
10.	**Towns and Villages**	Within 500m	Within 500m - 1km	Within 1-2km	>2km
11.	**Home/farmsteads**	Within 500m	Within 500m - 1km	Within 1-2km	>2km
12.	**National Roads**	Within 500m	Within 500m – 1km	Within 1-2km	>2km
13.	**Provincial/arterial roads**	Within 1km	Within 1-3km	Within 3-6km	>6km
14.	**Scenic routes**	Within 500m	Within 500m – 1km	Within 1-2km	>2km
15.	**Passenger rail lines**	Within 250m	Within 250 - 500m	Within 500m – 1km	>1km
16.	**Located with Renewable energy development zone**	No	-	-	Yes
17.	**VAC**	Low VAC	Moderate VAC	High VAC	Very High VAC
18.	**Glint and Glare**	YES – Major Road, airfield, or static ground-based receptors within 1km	YES – Major Road, airfield, or static ground-based receptors within 1 - 2km	YES – Major Road, airfield, or static ground-based receptors within 2 - 3km	No
19.	**Visual Quality**	Natural environment intact with no built infrastructure	Natural environment intact with limited built infrastructure	Natural environment somewhat intact with fair amount of built infrastructure	Built infrastructure is dominant with little to no natural environment remaining
20.	**Presence of existing infrastructure**	Absent	Very low densities	Present in moderate quantities	High densities
	Total	**Moderate (40)**			

Overall visual sensitivity rating:

- Low (0-20)
- Moderate (21-40)
- High (41-60)
- Very High (61-80)

The greater environment has been transformed owing mainly to dryland agriculture, as well as mining and other industrial activities (i.e. power stations, substations, etc.). Additionally, there are numerous existing powerlines that lie in close proximity to the site and traverse the study area, resulting in an overall low to moderate visual quality.

Visual Absorption Capacity (VAC) of the receiving environment is deemed to be low owing to the low growing vegetation, predominant land use (dryland agriculture) and the high contrast of the proposed PV panels within the surrounding environment.

The immediate area surrounding the proposed sites are the most populated with the study area with majority of the people residing in the residential areas of the towns of Komati, located directly adjacent to the proposed sites and Blinkpan to the north east. The R542, which is located along the southern boundary of PV Site A, is a provincial route that connects Emalahleni to Hendrina. Additionally, the R35, located further afield to the east of the proposed sites, is also a provincial route that connects Middelburg to the town of Bethal. Other than these arterial roads, a number of secondary roads also cross the study area. One airstrip, presumed to service the Komati Power Station was noted within the proposed development area of PV Site B. It is therefore assumed that this airstrip will no longer be in use following the development of PV Site B.

Homesteads and farmsteads, by virtue of their visually exposed nature, are considered to be sensitive visual receptors. Residential receptors in natural contexts are more sensitive than those in more built-up contexts, due to the absence of visual clutter in these undeveloped and undisturbed areas. Commuters and possible tourists using the main arterial and secondary roads may also be negatively impacted upon by the visual exposure to the proposed facilities, however, this intrusion would be fleeting.

The DFFE screening tool generated for the proposed Komati Solar PV and BESS Facility indicated that the Facility has an **overall very high sensitivity** owing to the fact that the site is located between 500 - 1000m of a town or village, between a and 2km of a town or village, within 500m of a town or village and located on mountain tops and high ridges.

Based on the above findings, it can be found that the sensitivity of the visual environment for the proposed Komati Solar PV and BESS Facility is confirmed to be **moderate** due to:

- High potential for solar glint and glare on users of the R542 and R34 arterial routes, as well as residents (static ground-based receptors) located on the outskirts of the town of Komati
- Town dwellings located within 1km away from the proposed sites
- No natural mountain tops and ridges were noted to be located within 1km from the nearest site. Main topographical features of any elevation noted within the immediate vicinity of the site were man-made elements of an industrial nature (i.e. mine dumps, slime dams, ash ponds, etc.)
- No PV panels are located on steep slopes, mountain tops or ridges
- Not located within a Renewable Energy Development Zone (REDZ)
- Low VAC of the receiving environment
- The already disturbed nature of the receiving environment (i.e. mining / industrial activities)

5.2. Potential visual exposure

The result of the viewshed analysis for the proposed Komati Solar PV and BESS Facility is shown on the map below (Error! Reference source not found.). The viewshed analysis was undertaken from a representative number of vantage points within the development footprints (i.e. PV Site A, PV Site B and the BESS sites) at an offset of 5m above ground level. This was done in order to determine the general visual exposure (visibility) of the area under investigation, simulating the maximum height of the proposed structures (PV panels, inverters, BESS, etc.) associated with the proposed project.

Error! Reference source not found. also indicates proximity radii from the development footprint in order to show the viewing distance (scale of observation) of the facility in relation to its surrounds.

The viewshed analysis includes the effect of vegetation cover and existing structures on the exposure of the proposed infrastructure.

The proposed Komati Solar PV and BESS Facility is expected to be visible for up to 6km from the development sites. The visual exposure is relatively scattered due to the undulating nature of the topography, with lower-lying land (e.g. along the Koringspruit and Olifants Rivers) shielded from the infrastructure, and only higher-lying terrain being exposed. It should be noted that the potential visual exposure will not occur in isolation, but rather in conjunction with the existing mining, power line and power station infrastructure in closer proximity to the sites.

The homesteads and roads expected to be visually influenced are listed below. The identification of these homesteads or farm dwellings are based on their locations as per the SA 1: 50 000 topographical maps[4]. Should a homestead / residence / institution not be listed in terms of the SA 1: 50 000 topographical maps, then it is assumed that the impacts will be similar to the other identified residences within the same proximity radii. It should also be noted that this section of the report focusses only on the potential visual exposure at varying distances and it does not yet refer to visual impact significance or any correlation thereto. The following is evident from the viewshed analyses:

0 – 1km

It is expected that the facility would be highly visible within this zone. A visually screened areas are scattered along the outskirts of the zone beyond the various higher mining and industrial features within this zone such as mine dumps and slime dams. The potential sensitive visual receptors within this zone include the town of Komati where visual exposure is expected from the outlying edges of the built-up areas, observers travelling along the R542 and R35 arterial roads, as well as the secondary road that runs along the western boundary of both the sites (PV Site A and PV Site B). It is expected that the PV facility would be highly visible to observers travelling along these roads. There are a number of homesteads located within a 1km radius of PV Site A, namely Goedehoop 3 and Geluk 1.

1 – 3km

This zone predominantly falls within mining land, vacant farmland and open space, but does contain sections of visual exposure to the abovementioned roads, some unknown homesteads further south along the R35, as well as the Geluk 2 homestead located to the east of the Komati Power Station and development sites.

3 - 6km

Within a 3 – 6km radius, the visual exposure will be significantly reduced, especially in the southern portion of this zone. Residences of the following homestead may be visually exposed:

- Bultfontein 2
- Goedehoop 2
- Koornfontein
- Welverdiend 3
- Broodsnyersplaas
- Bultfontein 3
- Five (5) unknown homesteads scattered throughout the zone

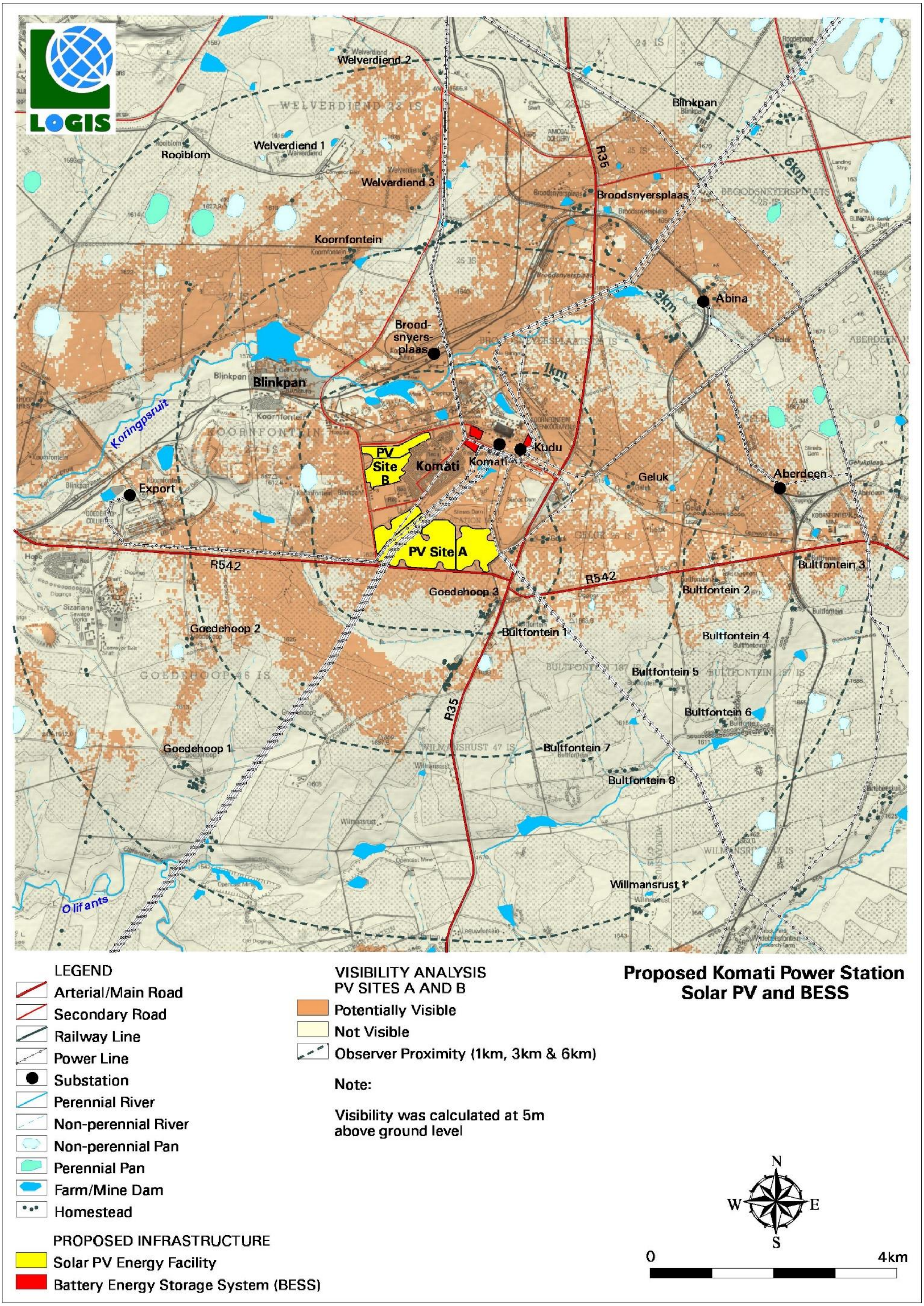
> 6km

Beyond the 6km radius, the intensity of visual exposure is expected to be very low and highly unlikely due to the distance between the object (Solar PV and BESS Facility) and the observer, especially when taking into consideration the developed and industrial nature of the area in closer proximity to the proposed infrastructure.

Conclusion

[4] The names listed here are of the homestead or farm dwelling as indicated on the SA 1: 50 000 topographical maps and do not refer to the registered farm name.

In general terms, it is envisaged that the structures, where visible from shorter distances (e.g. less than 1km and potentially up to 3km), and where sensitive visual receptors may find themselves within this zone, may constitute a high visual prominence, potentially resulting in a visual impact. This may include observers travelling along the R542 and R35 arterial roads, residents along the outskirts of the Komati residential area, and the homesteads mentioned above. It should once again be stressed that the visual exposure of the PV and BESS structures will be in conjunction with the existing visual clutter (power lines, power station and mining infrastructure) within the region.



Map 3: Potential visual exposure (visibility analysis) for Komati Solar PV and BESS Facility

5.3. Cumulative visual assessment

Cumulative visual impacts can be defined as the additional changes caused by a proposed development in conjunction with other similar developments or as the combined effect of a set of developments. In this case the 'development' would the proposed Komati Solar PV and BESS Facility as seen in conjunction with the existing (or proposed/authorised) renewable energy projects within the region. Refer to **Map 4.**

Cumulative visual impacts may be:

- Combined, where several PV facilities are within the observer's arc of vision at the same time;
- Successive, where the observer has to turn his or her head to see the various PV facilities; and
- Sequential, when the observer has to move to another viewpoint to see different developments, or different views of the same development (such as when travelling along a route).

The visual impact assessor is required (by the competent authority) to identify and quantify the cumulative visual impacts and to propose potential mitigating measures. This is often problematic as most regulatory bodies do not have specific rules, regulations or standards for completing a cumulative visual assessment, nor do they offer meaningful guidance regarding appropriate assessment methods. There are also not any authoritative thresholds or restrictions related to the capacity of certain landscapes to absorb the cumulative visual impacts of PV facilities.

To complicate matters even further, cumulative visual impact is not just the sum of the impacts of two developments. The combined effect of both may be much greater than the sum of the two individual effects, or even less.

The cumulative impact of the proposed solar PV and BESS infrastructure on the landscape and visual amenity is a product of:

- The distance between the PV facilities;
- The distance over which the structures are visible;
- The overall character of the landscape and its sensitivity to the structures;
- The siting and design of the facilities; and
- The way in which the landscape is experienced.

The specialist is required to conclude if the proposed development will result in any unacceptable loss of visual resource considering the industrial infrastructure proposed in the area.

The approach for this assessment includes all renewable energy projects within 30 km that have received an EA, as well as the proposed project. The information was collected from the National DFFE Renewable Energy EIA Application (REEA) database, 2022 Quarter 3.

This is the most accurate and up-to-date data available to the project team. There may be some projects with "in-process" applications for which data is not yet publicly available. This is the data found to be available and efforts were made to determine recent amendments. The REEA database contains land parcels, and not the footprints. In most cases the actual development footprint of the nearby Renewable Energy developments could not be easily quantified or accessed spatially. Hence the land parcels considered, are larger than the land the PV will occupy. It is important to note that the existence of an approved EA does not directly equate to actual development of the project. For these reasons this data tends towards a worst-case scenario.

Map 4 below details the approved (Environmentally Authorised) Renewable Energy Environmental Applications (REEA) within the study area (as of 2022 3rd quarter) within a 30 km radius from the proposed Komati Solar PV and BESS Facility. Applications that have been approved include the following PV facilities:

Table 6: List of renewable energy projects within 30 km from the proposed Komati Solar PV and BESS Facility

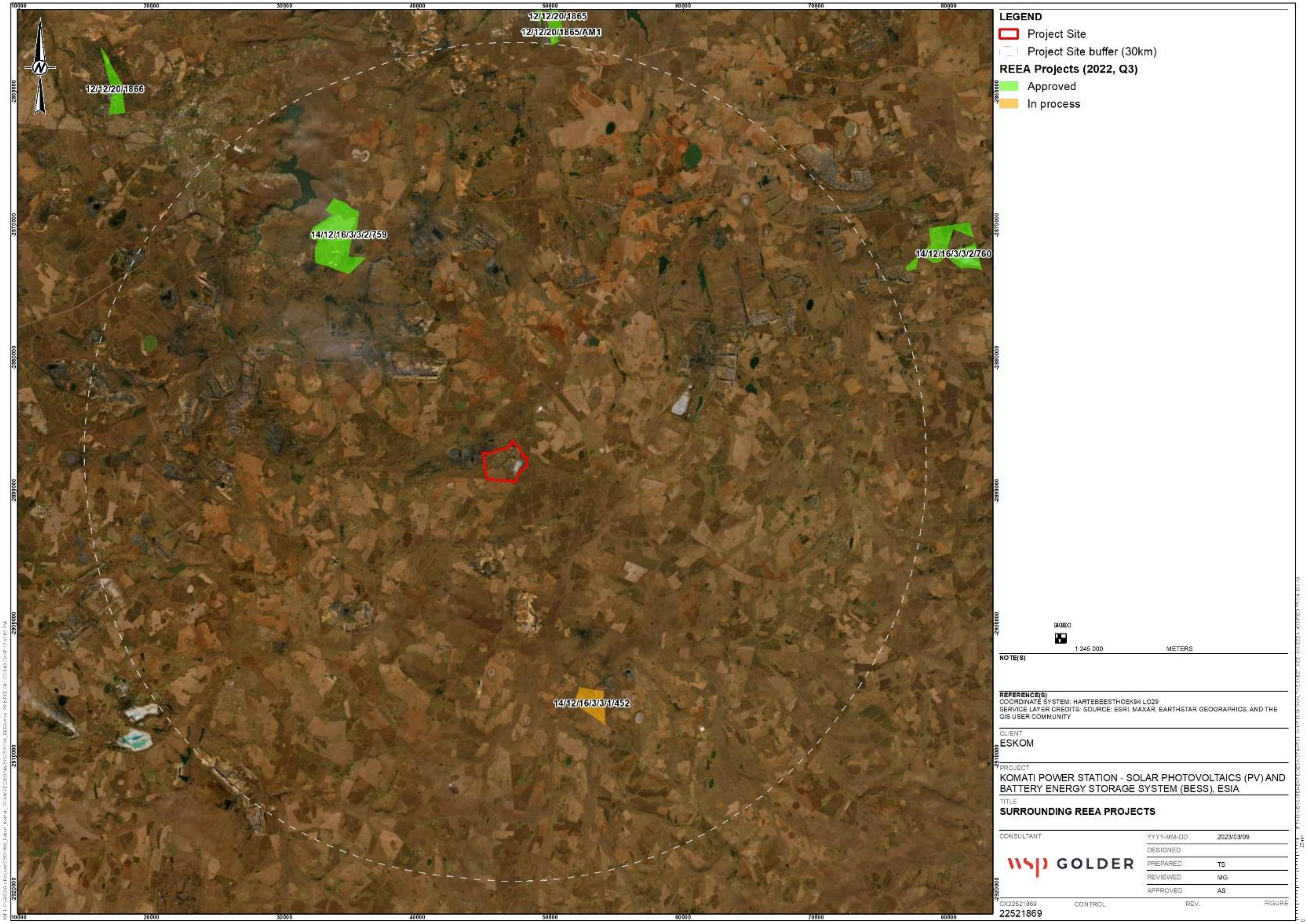
PROJECT TITLE	DFFE REFERENCE	STATUS
Proposed installation of a Solar photovoltaic power plant at ESKOM Duvha power station	14/12/16/3/3/2/759	Approved
Proposed Forzando North Coal Mine photovoltaic solar facility in Emalahleni Local Municipality, Mpumalanga Province	14/12/16/3/3/1/452	In process

Conclusion

The proposed Komati Solar PV and BESS Facility is located within an area where a limited number of other PV facilities have been authorized within 30km of the site, as seen in the table above and Map 4 below. There are no additional solar energy generation plants (or applications) within the study area itself and the closest approved application is the proposed installation of a solar photovoltaic power plant at the Eskom Duvha Power Station, some 18km north-west of the project site. Since both facilities identified above are located more than 15km away from the proposed Komati Solar PV and BESS Facility it is not expected that a cumulative visual impact of significance will be experienced by sensitive receptors within the region (within 30km).

Of note is that the proposed site is located within an area where a large network of power lines traverses the study area and congregate at the existing Komati Power Station, as well as in an area where mining and other industrial activities are already one of the dominant industries. It is generally acceptable, from a visual impact point of view, to place industrial infrastructure within existing industrial areas. Therefore, the existing visual disturbances brought about by the Komati Power Station and the various mines in close proximity of the proposed Komati Solar PV and BESS Facility to these, somewhat mitigates the visual impact of the structures and activities. Ironically this will also contribute to the potential cumulative visual impact of industrial infrastructure within the region. It is however still preferable to consolidate the proposed infrastructure in areas of existing visual disturbance, rather than to spread it over larger areas.

Considering the above, and the generally disturbed nature of the area surrounding the site itself, the potential cumulative visual impact is considered to be within acceptable limits.



Map 4: Renewable Energy Projects within 30km of the proposed Komati Solar PV

5.4. Visual distance / observer proximity to the PV facility

The proximity radii are based on the anticipated visual experience of the observer over varying distances. The distances are adjusted upwards for larger energy facilities/technologies (e.g. more extensive infrastructure associated with power plants) and downwards for smaller plants (e.g. smaller infrastructure associated with power plants with less generating capacity). This methodology was developed in the absence of any known and/or accepted standards for South African solar energy facilities.

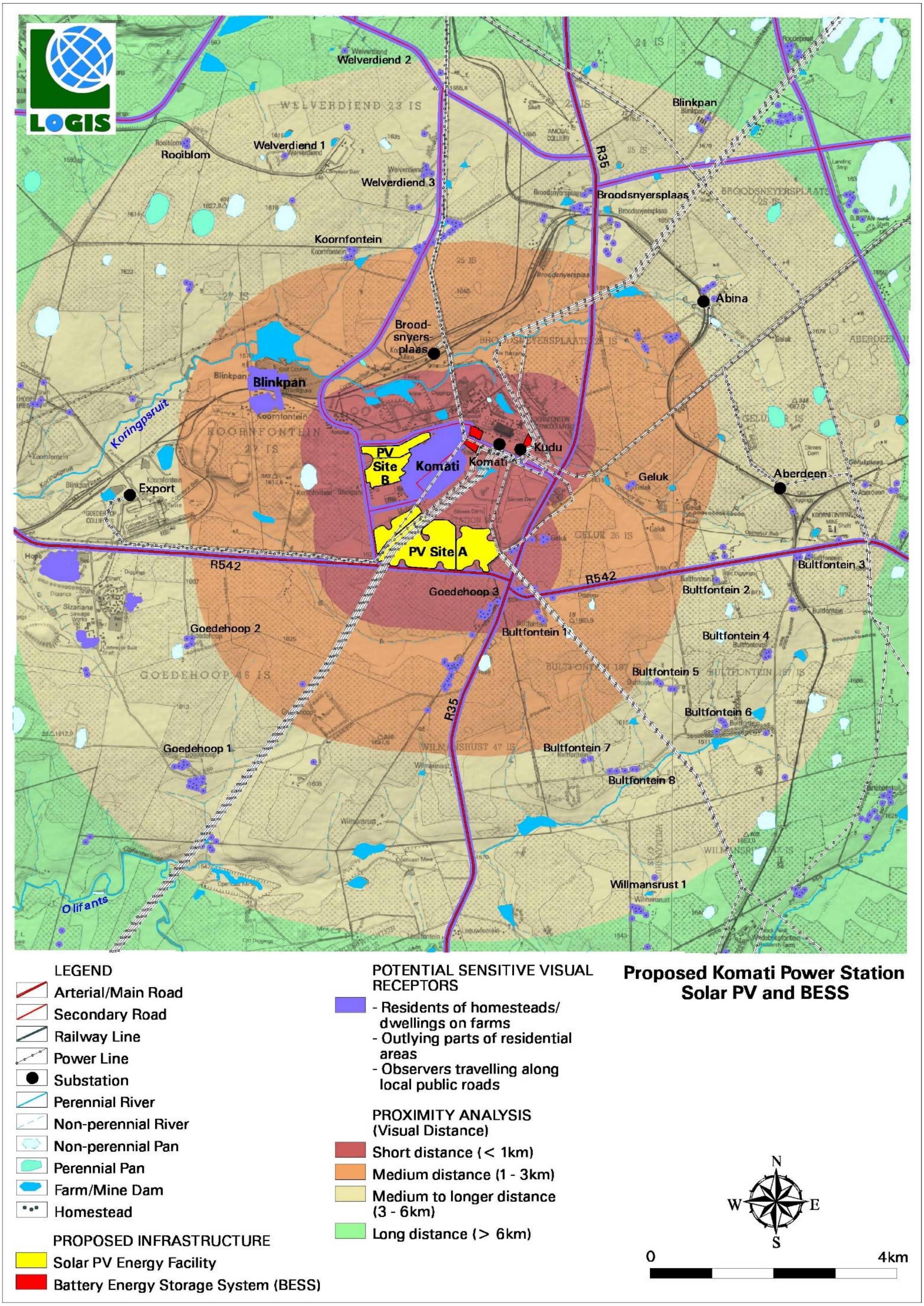
The principle of reduced impact over distance is applied in order to determine the core area of visual influence for these types of structures. It is envisaged that the nature of the structures and the predominantly rural and natural character of the study area would create a significant contrast that would make the facility visible and recognisable from greater distances.

The proximity radii for the proposed PV facility were created in order to indicate the scale and viewing distance of the facility and to determine the prominence of the structures in relation to their environment.

The proximity radii, based on the dimensions of the proposed development footprint are indicated on **Map 5**, and include the following:

- 0 - 1km. Very short distance view where the PV facility would dominate the frame of vision and constitute a very high visual prominence.
- 1 – 3km. Short distance view where the structures would be easily and comfortably visible and constitute a high visual prominence.
- 3 - 6km. Medium to longer distance view where the facility would become part of the visual environment, but would still be visible and recognisable. This zone constitutes a moderate visual prominence.
- > 6km. Long distance view of the facility where the structures are not expected to be immediately visible and not easily recognisable. This zone constitutes a lower visual prominence for the facility.

The visual distance theory and the observer's proximity to the facility are closely related, and especially relevant, when considered from areas with a high viewer incidence and a potentially negative visual perception of the proposed facility.



Map 5: Proximity analysis and potential sensitive visual receptors

5.5. Viewer incidence / viewer perception

The number of observers and their perception of a structure determine the concept of visual impact. If there are no observers or if the visual perception of the structure is favourable to all the observers, there would be no visual impact.

It is necessary to identify areas of high viewer incidence and to classify certain areas according to the observer's visual sensitivity towards the proposed Komati Solar PV and BESS Facility. It would be impossible not to generalise the viewer incidence and sensitivity to some degree, as there are many variables when trying to determine the perception of the observer: regularity of sighting, cultural background, state of mind, purpose of sighting, etc. which would create a myriad of options.

Viewer incidence is calculated to be the highest along the public roads within the study area (i.e. R542, R34 and various secondary roads). Travellers using these roads may be negatively impacted upon by visual exposure to the facility. Additional sensitive visual receptors are located at the farm residences (homesteads) and town / villages (i.e. Komati and Blink pan) scattered throughout the study area. It is expected that the viewer's perception, unless the observer is associated with (or supportive of) the PV facility, would generally be negative.

These potentially affected sensitive visual receptors are listed in **Section 5.2**. It is expected that these landowners may experience visual impacts ranging from moderate to high significance, depending on their proximity to the facility. Refer to **Map 5** for the location of the potential sensitive visual receptors discussed above.

The author (at the time of the compilation of this report) is not aware of any objections raised against the proposed Komati Solar PV and BESS Facility.

5.6. Visual absorption capacity

Visual Absorption Capacity (VAC) is the capacity of the receiving environment to absorb the potential visual impact of the proposed development. VAC is primarily a function of the vegetation and will be high if the vegetation is tall, dense and continuous. Conversely, low growing sparse and patchy vegetation will have a low VAC. The VAC also generally increases with distance, where discernible detail in visual characteristics of both environment and development decreases.

The broader study areas land cover is primarily *dryland agriculture and grassland* which is defined as an area dominated by nearly continuous planted field or grasses often devoid of taller plants such as trees. Refer to **Figure 24**.

Figure 24: Grassland and agricultural fields devoid of large trees

It is clear that the natural vegetation within the study area has a low visual absorption capacity (VAC). Where planted trees occur, the VAC is higher (see Figure 25 below). This may be a common occurrence at homesteads and settlements, but does not apply as a rule. Similar high VAC may be found along maize fields, although that is strictly dependent on the time of the growing season. Within built-up areas (e.g. residential or industrial areas) the VAC is high due to the presence of built structures and visual clutter.

Figure 25: Example of where vegetation and trees have been planted around homesteads

Overall, the Visual Absorption Capacity (VAC) of the receiving environment is moderate to high on the site itself and low in areas where transformation has occurred due to mining, agricultural activities or naturally occurring grasslands. In addition, the scale and form of the proposed PV structures mean that it is likely that the environment will visually absorb them in terms of texture, colour, form and light/shade characteristics. The PV structures should be absorbed by the visual clutter in the built up and industrial areas. Therefore, within this area the VAC will be taken into account.

Figure 26: Example of visual clutter in built up areas

Where homesteads and settlements occur, some more significant vegetation and trees may have been planted, which would contribute to the visual absorption capacity (i.e. shielding the observers from the infrastructure). As this is not a consistent occurrence, however, VAC will not be taken into account for any of the homesteads or settlements, thus assuming a worst-case scenario in the impact assessment.

5.7. Visual impact index

The combined results of the visual exposure, viewer incidence/perception and visual distance of the proposed Komati Solar PV and BESS Facility are displayed on Error! Reference source not found.. Here the weighted impact and the likely areas of impact have been indicated as a visual impact index. Values have been assigned for each potential visual impact per data category and merged in order to calculate the visual impact index.

The criteria (previously discussed in this report) which inform the visual impact index are:

- Visibility or visual exposure of the structures
- Observer proximity or visual distance from the structures
- The presence of sensitive visual receptors
- The perceived negative perception or objections to the structures (if applicable)
- The visual absorption capacity of the vegetation cover or built structures (if applicable)

An area with short distance visual exposure to the proposed infrastructure, a high viewer incidence and a potentially negative perception (i.e. a sensitive visual receptor) would therefore have a **higher** value (greater impact) on the index. This helps in focussing the attention to the critical areas of potential impact and determining the potential **magnitude** of the visual impact.

The index indicates that **potentially sensitive visual receptors**[5] within a 1km radius of the proposed facility may experience a **very high** visual impact. The magnitude of visual impact on sensitive visual receptors subsequently subsides with distance to; **high** within a 1–3km radius (where/if sensitive receptors are present) and **moderate** within a 3–6km radius (where/if sensitive receptors are present). Receptors beyond 6km are expected to have a **low** potential visual impact.

Likely areas of potential visual impact and potential sensitive visual receptors located within a 6km radius of the proposed Komati Solar PV and BESS are displayed on **Map 7**.

Magnitude of the potential visual impact

The PV facility may have a visual impact of **very high** magnitude on the following identified observers within a 0-1km radius:

Observers travelling along the:

- R542 arterial road in the south (Site 1)
- R35 arterial road in the east (Site 2)
- Secondary road running along the western boundary of the PV sites (Site 3)

Residents of/visitors to:

- Komati outlying areas (Site 4)
- Goedehoop 3 (Site 5)
- Geluk 1 (Site 6)

The PV Facility may have a visual impact of **high** magnitude on the following identified observers 1 – 3km radius:

Residents of/visitors to:

- Two (2) unknown homesteads (Sites 7 and 8)
- Geluk 2 (Site 9)

The PV facility may have a visual impact of **moderate** magnitude impact on the following identified observers located between a 3 – 6km radius of the PV facility:

Residents of/visitors to:

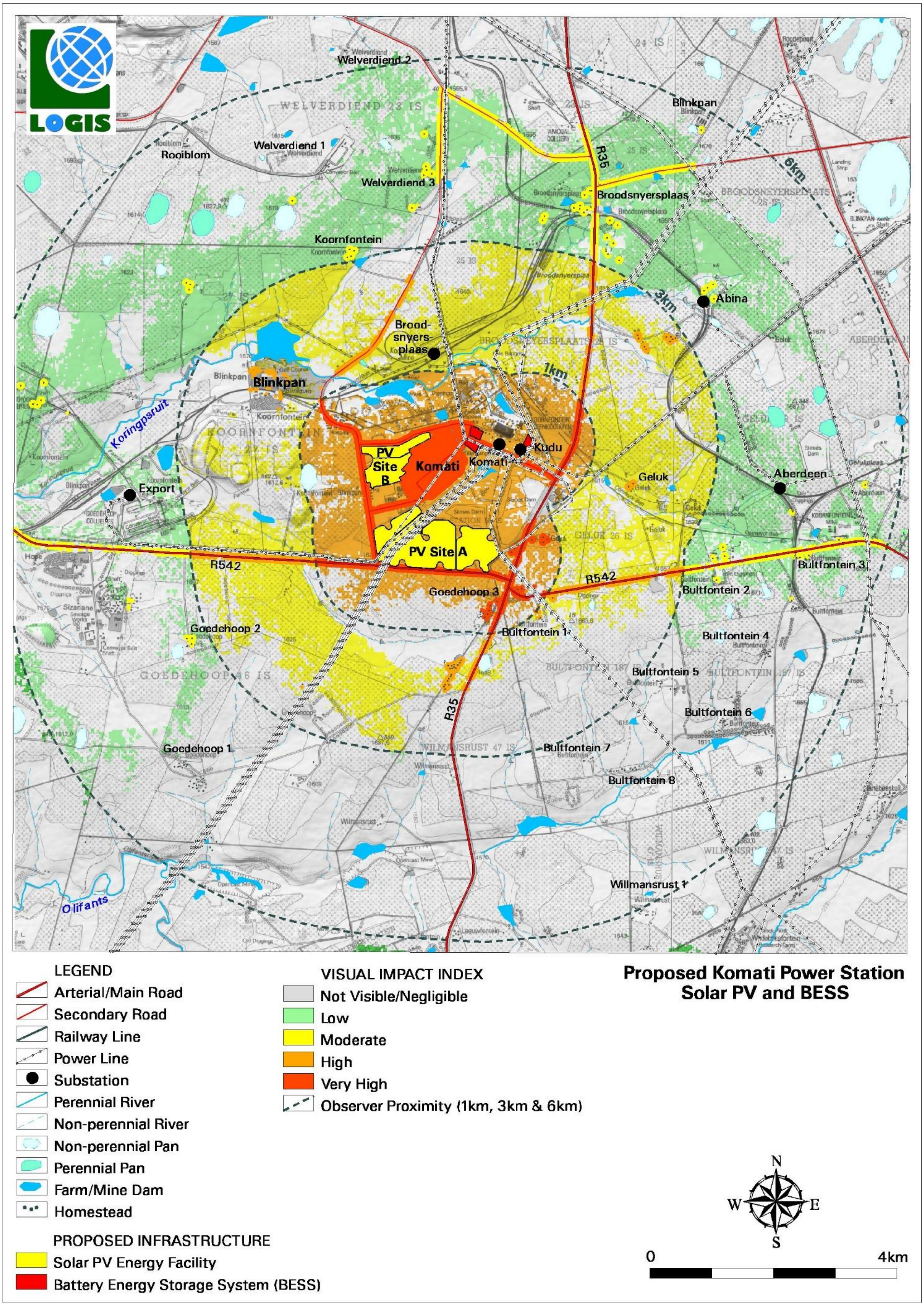
- Bultfontein 2 (Site 10)
- Goedehoop 2 (Site 11)
- Four (4) unknown homesteads (Sites 12, 13, 15 and 18)
- Koornfontein (Site 14)
- Welverdiend 3 (Site 16)
- Broodsnyersplaas (Site 17)
- An unknown homestead near Abina (Site 19)

[5] The names indicated on the map and listed below here are of the homestead or farm dwelling as indicated on the SA 1: 50 000 topographical maps and do not refer to the registered farm name. Should a homestead / residence / institution not be listed in terms of the SA 1: 50 000 topographical maps, then it is assumed that the impacts will be similar to the other identified residences within the same proximity radii.

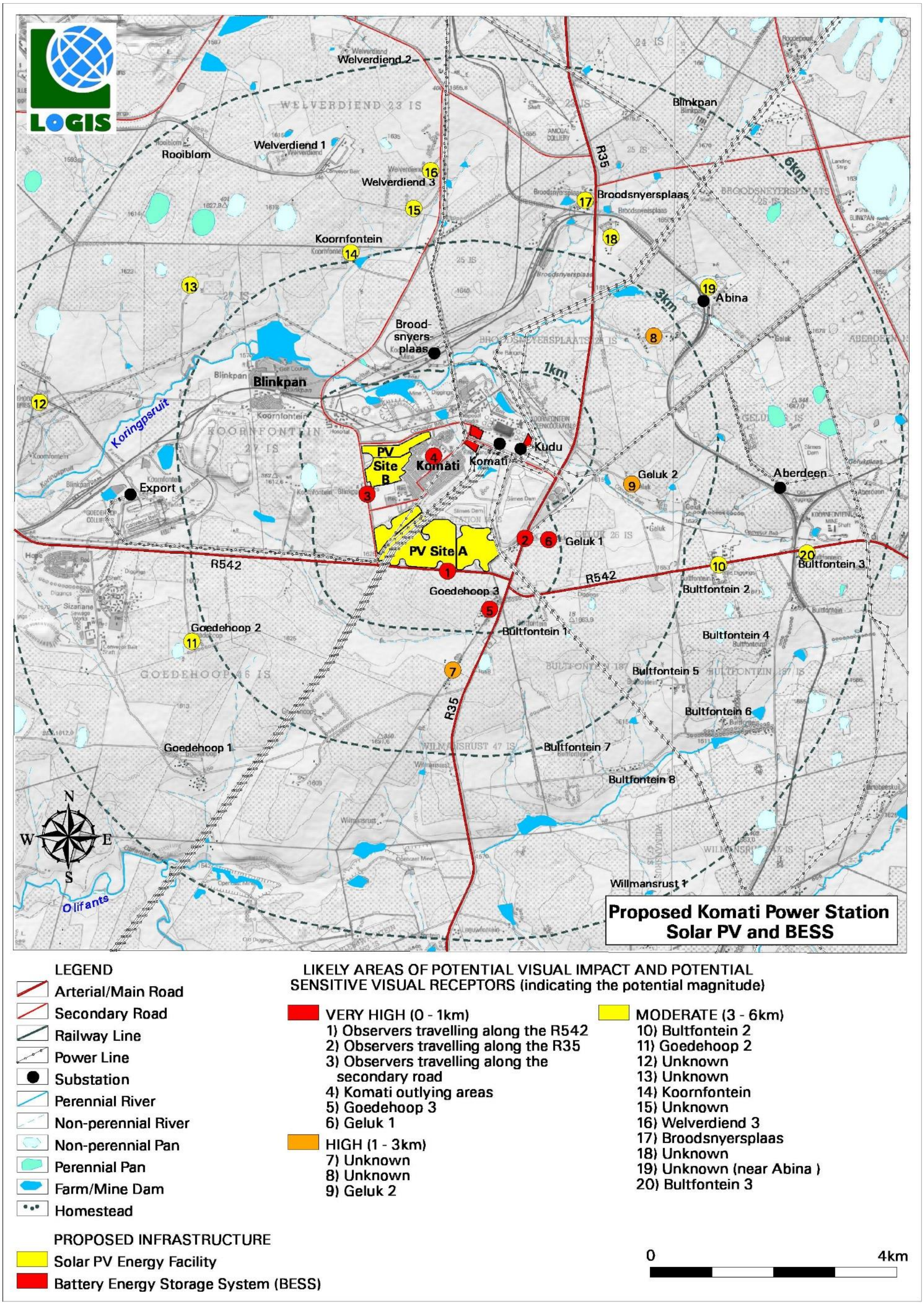
- Bultfontein 3 (Site 20)

The PV facility may have a visual impact of **low** magnitude impact on observers located beyond the 6km radius of the PV facility.

Note: *Where any of the above-mentioned homesteads are derelict or deserted, the visual impact will be non-existent, until such time as it is inhabited again.*



Map 6: Visual impact index for the proposed Komati Solar PV and BESS Facility



Map 7: Visibility index illustrating the frequency of exposure of the proposed Komati Solar PV and BESS Facility

6. VISUAL IMPACT ASSESSMENT

6.1. Impact rating methodology

The previous section of the report identified specific areas where likely visual impacts would occur. This section will attempt to quantify these potential visual impacts in their respective geographical locations and in terms of the identified issues (see **Section 3**) related to the visual impact.

The methodology for the assessment of potential visual impacts states the **nature** of the potential visual impact (e.g. the visual impact on users of major roads in the vicinity of the proposed infrastructure) and includes a table quantifying the potential visual impact according to the following criteria:

Extent – The distance the visual impact extends from the proposed development and to what extent it will have the highest impact. In the case of this type of development the extent of the visual impact is most likely to have a higher impact on receptors closer to the development and decrease as the distance increases[6].

- Long distance (very low = 1)
- Medium to longer distance (low = 2)
- Short distance (medium = 3)
- Very short distance (high = 4)

Duration – The timeframe in both the construction and operational phase over which the effects of the impact will be felt.

- Very short (0-1 yrs. = 1)
- Short (2-5 yrs. = 2)
- Medium (5-15 yrs. = 3)
- Long (>15 yrs. = 4)
- Permanent (= 5)

Magnitude – The severity or size of the impact. This value is read off the Visual Impact Index maps. Where more than one value is applicable, the higher of these will be used as a worst-case scenario[7].

- None (= 0)
- Minor (= 2)
- Low (= 4)
- Moderate (= 6)
- High (= 8)
- Very high (= 10)

Probability – The likelihood of the impact occurring.

- Very improbable (= 1) Less than 20% sure of the likelihood of an impact occurring
- Improbable (= 2) 20-40% sure of the likelihood of an impact occurring
- Probable (= 3) 40-60% sure of the likelihood of an impact occurring
- Highly probable (= 4) 60-80% sure of the likelihood of that impact occurring
- Definite (= 5) More than 80% sure of the likelihood of that impact occurring

Status - The perception of Interested and Affected Parties towards the proposed development.

- Positive
- Negative
- Neutral

Reversibility – The possibility of visual recovery of the impact following the decommissioning of the proposed development.

- Reversible (= 1)
- Recoverable (= 3)
- Irreversible (= 5)

[6] Long distance = > 6km. Medium to longer distance = 3 – 6km. Short distance = 1 – 3km. Very short distance = < 1km (refer to Section 6.3. Visual distance/observer proximity to the facility).

[7] This value is read from the visual impact index. Where more than one value is applicable, the higher of these will be used as a worst-case scenario.

Significance - The **significance** of the potential visual impact is equal to the **consequence** multiplied by the **probability** of the impact occurring, where the consequence is determined by the sum of the individual scores for magnitude, duration and extent (i.e. **significance = consequence (magnitude + duration + extent) x probability**).

The significance weighting for each potential visual impact (as calculated above) is as follows:

- <30 points: Low
  Where the impact would not have a direct influence on the decision to develop in the area.
- 30-60 points: Medium/moderate
  Where the impact could influence the decision to develop in the area.
- >60: High
  Where the impact must have an influence on the decision to develop in the area.

6.2. Direct Impacts

The direct visual impacts of the proposed Komati Solar PV and BESS Facility are assessed as follows:

6.2.1. Construction Phase Impacts

During the construction period it is expected that any visual impact of concern on sensitive visual receptors within the study area will be temporary and limited to a short-term period (2-5 years). The below direct construction visual impacts of the proposed Komati Solar PV and BESS Facility are assessed as follows:

6.2.1.1. Potential visual impact of construction activities on sensitive visual receptors in close proximity (within 1km) to the proposed PV facility.

During the construction period, there will be an increase in heavy vehicles utilising the roads to the construction sites that may cause, at the very least, a visual nuisance to other road users and landowners in the area in close proximity (within 1km). Additionally, dust as a result of the construction activities and construction equipment (i.e. cranes), temporary laydown areas, construction camps, etc. may also be visible at the site, resulting in a visual impact occurring during construction.

Construction activities may potentially result in a **high** (significance rating = 64) temporary visual impact, that may be mitigated to **moderate** (significance rating = 36).

A mitigating factor in this scenario is that observers travelling along the various roads (i.e. R542, R35, and secondary road) will only experience a visual impact for a brief period of time and it is expected the visual exposure of the PV facility structures will be in conjunction with the existing visual clutter (power lines, power station and mining infrastructure) within the region. This reduces the probability of this impact occurring.

Table 7: Visual impact of construction on sensitive visual receptors in close proximity (within 1km) to the proposed PV facility.

Nature of Impact: Visual impact of construction activities on sensitive visual receptors in close proximity to the proposed PV facility.		
	Without mitigation	***With mitigation***
Extent	Very Short distance **(4)**	Very Short **distance (4)**
Duration	Short term **(2)**	Short term **(2)**
Magnitude	Very high **(10)**	Moderate **(6)**
Probability	Highly Probable **(4)**	Probable **(3)**
Significance	High **(64)**	Moderate **(36)**
Status (positive or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)

Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	

Mitigation: Planning: ➢ Retain and maintain natural vegetation in all areas outside of the development footprint, but within the project site. Construction: ➢ Ensure that vegetation is not unnecessarily removed during the construction period. ➢ Plan the placement of laydown areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e. in already disturbed areas) where possible. ➢ Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads. ➢ Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed of regularly at licensed waste facilities. ➢ Reduce and control construction dust using approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent). ➢ Restrict construction activities to daylight hours whenever possible in order to reduce lighting impacts. ➢ Rehabilitate all disturbed areas immediately after the completion of construction works.
Residual impacts: None, provided that rehabilitation works are carried out as required.

6.2.2. Operational Phase Impacts

6.2.2.1. Potential visual impact on sensitive visual receptors located within a 1km radius of the PV Facility

The operation of the proposed PV facility is expected to have a **high** visual impact (significance rating = 72) pre-mitigation and a **moderate** visual impact (significance rating = 42) post mitigation on sensitive receptors (as per Section 5.7) within a 1km radius of the PV and BESS Facility.

A mitigating factor in this scenario is that observers travelling along the various roads (i.e. R542, R35, and secondary road) will only experience a visual impact for a brief period of time and it is expected the visual exposure of the PV facility structures will be in conjunction with the existing visual clutter (power lines, power station and mining infrastructure) within the region. This reduces the probability of this impact occurring.

Mitigation of this impact is possible and both specific measures as well as general "best practice" measures are recommended in order to reduce/mitigate the potential visual impact. The table below illustrates this impact assessment.

Table 8: Visual impact on observers (residents and visitors) in close proximity (within 1km) to the proposed PV facility

Nature of Impact: Visual impact on observers (residents at homesteads and visitors/tourists) in close proximity (i.e. within 1km) to the PV facility		
	Without mitigation	***With mitigation***
Extent	Very Short distance **(4)**	Very Short distance **(4)**
Duration	Long term **(4)**	Long term **(4)**
Magnitude	Very high **(10)**	Moderate **(6)**
Probability	Highly Probable **(4)**	Probable **(3)**
Significance	High **(72)**	Moderate **(42)**

Status (positive, neutral or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Generic best practise mitigation/management measures: Planning: ➢ Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude, but within the project site. ➢ Consult adjacent landowners (if present) in order to inform them of the development and to identify any (valid) visual impact concerns. Operations: ➢ Maintain the general appearance of the facility as a whole. ➢ Retain/re-establish and maintain natural vegetation (if present) immediately adjacent to the development footprint, where possible. ➢ Investigate the potential to screen affected receptor sites (if applicable and located within 1km of the facility) with planted vegetation cover.		
Residual impacts: The visual impact will be removed after decommissioning, provided the facility infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.		

6.2.2.2. Potential visual impact on sensitive visual receptors within the 1 – 3km radius

The operational facility could have a **moderate** visual impact (significance rating = 45) which may be mitigated to **low** (significance rating = 26) on residents/visitors to the homesteads as identified in Section 5.7 within 1 – 3km radius of the facility.

A mitigating factor in this scenario is that the visual exposure of the PV facility structures will be in conjunction with the existing visual clutter (power lines, power station and mining infrastructure) within the region. This reduces the probability of this impact occurring.

Mitigation of this impact is possible and both specific measures as well as general "best practice" measures are recommended in order to reduce/mitigate the potential visual impact. The table below illustrates this impact assessment.

Table 9: Visual impact of the proposed PV facility within 1 – 3km radius

Nature of Impact: Visual impact on residents at homesteads within a 1 – 3km radius of the facility		
	Without mitigation	***With mitigation***
Extent	Short distance **(3)**	Short distance **(3)**
Duration	Long term **(4)**	Long term **(4)**
Magnitude	High **(8)**	Moderate **(6)**
Probability	Probable **(3)**	Improbable **(2)**
Significance	Moderate **(45)**	Low **(26)**
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	

Generic best practise mitigation/management measures: <u>Planning:</u> ➢ Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude, but within the project site. <u>Operations:</u> ➢ Maintain the general appearance of the facility as a whole. ➢ Retain/re-establish and maintain natural vegetation (if present) immediately adjacent to the development footprint, where possible. ➢ Investigate the potential to screen affected receptor sites (if applicable and located within 1km of the facility) with planted vegetation cover.
Residual impacts: The visual impact will be removed after decommissioning, provided the facility infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.

6.2.2.3. Potential visual impact on sensitive visual receptors within the 3 – 6km radius

The operational facility could have a **low** visual impact both before (significance rating = 24) and after mitigation (significance rating = 20) on residents/visitors to the homesteads as identified in Section 5.7 within 3 – 6km radius of the facility.

A mitigating factor in this scenario is that the visual exposure of the PV facility structures will be in conjunction with the existing visual clutter (power lines, power station and mining infrastructure) within the region. This reduces the probability of this impact occurring.

Mitigation of this impact is possible and both specific measures as well as general "best practice" measures are recommended in order to reduce/mitigate the potential visual impact. The table below illustrates this impact assessment.

Table 10: Visual impact of the proposed PV facility within the 3 – 6km radius

Nature of Impact: Visual impact on observers travelling along the roads and residents at homesteads within a 3 – 6km radius of the facility		
	Without mitigation	***With mitigation***
Extent	Medium distance **(2)**	Medium distance **(2)**
Duration	Long term **(4)**	Long term **(4)**
Magnitude	Moderate **(6)**	Low **(4)**
Probability	Improbable **(2)**	Improbable **(2)**
Significance	Low **(24)**	Low **(20)**
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Generic best practise mitigation/management measures: <u>Planning:</u> ➢ Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude, but within the project site. <u>Operations:</u> ➢ Maintain the general appearance of the facility as a whole. ➢ Retain/re-establish and maintain natural vegetation (if present) immediately adjacent to the development footprint, where possible. ➢ Investigate the potential to screen affected receptor sites (if applicable and located within 1km of the facility) with planted vegetation cover.		
Residual impacts: The visual impact will be removed after decommissioning, provided the facility infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.		

6.2.2.4. Potential visual impact on sensitive visual receptors within the greater area (beyond 6km radius)

The operational facility could have a **low** visual impact both pre and post mitigation on sensitive receptors, as well as observers travelling along the various roads beyond the 6km radius of the facility.

A mitigating factor in this scenario is that observers travelling along the various roads (i.e. R542, R35, and various secondary roads) will only experience a visual impact for a brief period of time and it is expected the visual exposure of the PV facility structures will be in conjunction with the existing visual clutter (power lines, power station and mining infrastructure) within the region. This reduces the probability of this impact occurring.

Mitigation of this impact is possible and both specific measures as well as general "best practice" measures are recommended in order to reduce/mitigate the potential visual impact. The table below illustrates this impact assessment.

Table 11: Visual impact of the proposed PV facility within the greater area (beyond the 6km radius)

Nature of Impact: Visual impact on observers travelling along the roads, residents at homesteads and protected areas beyond the 6km radius of the facility		
	Without mitigation	***With mitigation***
Extent	Long distance **(1)**	Long distance **(1)**
Duration	Long term **(4)**	Long term **(4)**
Magnitude	Low **(4)**	Low **(4)**
Probability	Improbable **(2)**	Very improbable **(1)**
Significance	Low **(18)**	Low **(9)**
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Generic best practise mitigation/management measures: <u>Planning:</u> ➢ Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude, but within the project site. <u>Operations:</u> ➢ Maintain the general appearance of the facility as a whole. ➢ Retain/re-establish and maintain natural vegetation (if present) immediately adjacent to the development footprint, where possible. ➢ Investigate the potential to screen affected receptor sites (if applicable and located within 1km of the facility) with planted vegetation cover.		
Residual impacts: The visual impact will be removed after decommissioning, provided the PV infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.		

6.2.2.5. Potential visual impact of operational, safety and security lighting of the facility at night

The area immediately surrounding the proposed facility has a relatively high incidence of receptors and light sources (i.e exiting power station, towns and mines), so light trespass and glare from the security and after-hours operational lighting for the facility will likely not have a significant impact on visual receptors in the study area, especially those located in closer proximity to the PV Facility especially within 0-1km and potentially up to 3km.

Lighting impacts relate to the effects of glare and sky glow. The source of glare light is unshielded luminaries which emit light in all directions and which are visible over long distances.

Sky glow is the condition where the night sky is illuminated when light reflects off particles in the atmosphere such as moisture, dust or smog. The sky glow intensifies with the increase in the number of light sources. Each new light source, especially upwardly directed lighting, contribute to the increase in sky glow. It is possible that the PV facility may contribute to the already existing sky glow within the environment which is highly developed.

A mitigating factor in this scenario is that the expected lighting impacts of the PV and BESS Facility will be in conjunction with the existing sky-glow as a result of existing development (i.e. substations, power station, town and mining infrastructure) within the region. This reduces the probability of this impact occurring.

Mitigation of direct lighting impacts and sky glow entails the pro-active design, planning and specification of lighting for the facility. The correct specification and placement of lighting and light fixtures for the facility and the ancillary infrastructure will go far to contain rather than spread the light.

This anticipated lighting impact is likely to be of **moderate** significance (rating = 39), and may be mitigated to **low** (rating = 22) especially within 0-1km and potentially up to 3km radius of the PV and BESS Facility.

Table 12: Impact table summarising the significance of visual impact of lighting at night on visual receptors in close to medium proximity (within 0-1km and potentially up to 3km) to the proposed PV facility

<table>
<tr><td colspan="3">Nature of Impact:
Visual impact of lighting at night on sensitive visual receptors.</td></tr>
<tr><td></td><td>No mitigation</td><td>Mitigation considered</td></tr>
<tr><td>Extent</td><td>Short/Medium (3)</td><td>Short/Medium (3)</td></tr>
<tr><td>Duration</td><td>Long term (4)</td><td>Long term (4)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr>
<tr><td>Significance</td><td>Moderate (39)</td><td>Low (22)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
<tr><td>Reversibility</td><td>Reversible (1)</td><td>Reversible (1)</td></tr>
<tr><td>Irreplaceable loss of resources?</td><td>No</td><td>No</td></tr>
<tr><td>Can impacts be mitigated?</td><td colspan="2">Yes</td></tr>
<tr><td colspan="3">Mitigation:
<u>Planning & operation</u>:
➢ Shield the sources of light by physical barriers (walls, vegetation, or the structure itself).
➢ Limit mounting heights of lighting fixtures, or alternatively use foot-lights or bollard level lights.
➢ Make use of minimum lumen or wattage in fixtures.
➢ Make use of down-lighters, or shielded fixtures.
➢ Make use of Low-Pressure Sodium lighting or other types of low impact lighting.
➢ Make use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.</td></tr>
<tr><td colspan="3">Cumulative impacts:
The expected lighting impacts of the PV and BESS Facility will be in conjunction with the existing sky-glow as a result of existing development (i.e. substations, power station, town and mining infrastructure) within the region. There it is not expected that the additional lightning at night will contribute to a local and regional increase in lighting impact.</td></tr>
</table>

Residual impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.

6.2.2.6. Solar glint and glare

6.2.2.6.1. Potential visual impact of solar glint and glare as a visual distraction and possible air/road travel hazard

Glint and glare occurs when the sun reflects off surfaces with specular (mirror-like) properties. Examples of these include glass windows, water bodies and potentially some solar energy generation technologies (e.g. parabolic troughs and CSP heliostats). Glint is generally of shorter duration and is described as "a momentary flash of bright light", whilst glare is the reflection of bright light for a longer duration.

The visual impact of glint and glare relates to the potential it has to negatively affect sensitive visual receptors in relatively close proximity to the source (e.g. users of the secondary road), or aviation safety risk for pilots (especially where the source interferes with the approach angle to the runway). The Federal Aviation Administration (FAA) of the United States of America have researched glare as a hazard for aviation pilots on final approach and may prescribe specific glint and glare studies for solar energy facilities in close proximity to aerodromes (airports, airfields, military airbases, etc.). It is generally possible to mitigate the potential glint and glare impacts through the design and careful placement of the infrastructure.

PV panels are designed to generate electricity by absorbing the rays of the sun and are therefore constructed of dark-coloured materials, and are covered by anti-reflective coatings. Indications are that as little as 2% of the incoming sunlight is reflected from the surface of modern PV panels especially where the incidence angle (angle of incoming light) is smaller i.e. the panel is facing the sun directly. This is particularly true for tracker arrays that are designed to track the sun and keep the incidence angle as low as possible.[8]

There are two (2) major roads within a 1km radius of the proposed PV facility, namely the R542 and R35. This approximate distance is recommended as a threshold within which the visual impact of glint and glare (if there is visual line of sight from the road) may influence road users.[9]

The potential visual impact related to solar glint and glare as a road travel hazard is therefore expected to be of **moderate** significance both before and after mitigation for users of the R542 and R35.

One airstrip, presumed to service the Komati Power Station was noted within the proposed development area of PV Site B. It is therefore assumed that this airstrip will no longer be in use following the development of PV Site B. However, should this airstrip still intend to be used then it is recommended that that a Glint and Glare Assessment be undertaken and that the impacts as assessed in the Table below are amended.

Table 13: Impact table summarising the significance of the visual impact of solar glint and glare as a visual distraction to users of the secondary road

Nature of Impact: The visual impact of solar glint and glare as a visual distraction and possible road travel hazard		
	Without mitigation	***With mitigation***
Extent	Very short distance **(4)**	Very short distance **(4)**
Duration	Long term **(4)**	Long term **(4)**
Magnitude	Very High **(10)**	Moderate **(6)**
Probability	Probable **(3)**	Improbable **(3)**
Significance	Moderate **(54)**	Moderate **(42)**

[8] Sources: Blue Oak Energy, FAA and Meister Consultants Group.

[9] December 2020, Solar Photovoltaic Glint and Glare Guidance Third Edition.

Status (positive or negative)	Negative	Negative
Reversibility	Reversible **(1)**	Reversible **(1)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: <u>Planning & operation</u>: ➢ Retain/re-establish and maintain natural vegetation (if present) immediately adjacent to the development footprint. ➢ Use anti-reflective panels and dull polishing on structures, where possible and industry standard. ➢ Adjust tilt angles of the panels if glint and glare issues become evident, where possible. ➢ If specific sensitive visual receptors are identified during operation, investigate screening at the receptor site, where possible. ➢ Recommended that a Glint and Glare Assessment be undertaken if the airstrip noted on PV Site B will be retained and used during the operational phase of the development.		
Residual impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.		

6.2.2.6.2. Potential visual impact of solar glint and glare on static ground-based receptors (residents of homesteads) in close proximity (within 1km) to the PV facility

Residences located on the outskirts of the town of Komati, as well as residents of Goedehoop 3 and Geluk 1 are all located within a 1km radius of the proposed PV facility. The potential visual impact related to solar glint and glare on static ground-based receptors (residents of homesteads) is therefore expected to be of a **high** visual impact (significance rating = 64) which may be mitigated to **moderate** (significance rating = 42)

Mitigation of this impact is possible and both specific measures as well as general "best practice" measures are recommended in order to reduce/mitigate the potential visual impact. The table below illustrates this impact assessment.

Table 14: Impact table summarising the significance of the visual impact of solar glint and glare on static ground receptors

Nature of Impact: The visual impact of solar glint and glare on residents of homesteads in closer proximity (within 1km) to the PV facility		
	Without mitigation	***With mitigation***
Extent	Very short distance **(4)**	Very short distance **(4)**
Duration	Long term **(4)**	Long term **(4)**
Magnitude	High **(8)**	Moderate **(6)**
Probability	Highly Probable **(4)**	Probable **(3)**
Significance	High **(64)**	Moderate **(42)**
Status (positive or negative)	Negative	Negative
Reversibility	Reversible **(1)**	Reversible **(1)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: <u>Planning & operation</u>:		

➢ Use anti-reflective panels and dull polishing on structures, where possible and industry standard. ➢ If specific sensitive visual receptors are identified during operation, investigate screening at the receptor site, where possible.
Residual impacts: The visual impact will be removed after decommissioning, provided the PV facility infrastructure is removed. Failing this, the visual impact will remain.

6.2.3. Ancillary infrastructure

On-site ancillary infrastructure associated with the PV and BESS Facility includes a onsite substation, Operations and Maintenance building, Security building, etc. No dedicated viewshed analyses have been generated for the ancillary infrastructure, as the range of visual exposure will fall within that of the PV and BESS Facility.

The anticipated visual impact resulting from this infrastructure is likely to be of **low** significance both before and after mitigation.

Table 15: Visual impact of the ancillary infrastructure

Nature of Impact: Visual impact of the ancillary infrastructure on observers in close proximity to the structures.		
	Without mitigation	***With mitigation***
Extent	Very Short distance **(4)**	Very Short distance **(4)**
Duration	Long term **(4)**	Long term **(4)**
Magnitude	Low **(4)**	Low **(4)**
Probability	Improbable **(2)**	Improbable **(2)**
Significance	Low **(24)**	Low **(24)**
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Generic best practise mitigation/management measures: Planning: ➢ Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude, but within the project site. Operations: ➢ Maintain the general appearance of the facility as a whole. ➢ Retain/re-establish and maintain natural vegetation (if present) immediately adjacent to the development footprint, where possible. ➢ Investigate the potential to screen affected receptor sites (if applicable and located within 1km of the facility) with planted vegetation cover.		
Residual impacts: The visual impact will be removed after decommissioning, provided the ancillary infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.		

6.2.4. Decommissioning Impacts

During decommissioning there may be a noticeable increase in heavy vehicles utilising the roads to the site that may cause, at the very least, a visual nuisance to other road users and landowners in closer proximity (< 1km) to the decommissioning activities.

Decommissioning activities may potentially result in a **moderate** (significance rating = 52), temporary visual impact, that may be mitigated to **moderate** (significance rating = 33).

A mitigating factor in this scenario is that observers travelling along the various roads (i.e. R542, R35, and secondary road) will only experience a visual impact for a brief period of time and it is expected the visual exposure of the PV facility structures will be in conjunction with the existing visual clutter (power lines, power station and mining infrastructure) within the region. This reduces the probability of this impact occurring.

Table 16: Visual impact of decommissioning activities on sensitive visual receptors in close proximity (within 1km) to the proposed facility

Nature of Impact: Visual impact of construction activities on sensitive visual receptors in close proximity (within 1km) to the proposed facility.		
	Without mitigation	***With mitigation***
Extent	Very short distance **(4)**	Very short distance **(4)**
Duration	Very Short term **(1)**	Very Short term **(1)**
Magnitude	High **(8)**	Moderate **(6)**
Probability	Highly probable **(4)**	Probable **(3)**
Significance	Moderate **(52)**	Moderate **(33)**
Status (positive or negative)	Negative	Negative
Reversibility	Reversible **(1)**	Reversible **(1)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: Decommissioning: ➢ Remove infrastructure not required for the post-decommissioning use of the site. ➢ Rehabilitate all areas as per the rehabilitation plan undertaken. Consult an ecologist regarding rehabilitation specifications. ➢ Monitor rehabilitated areas post-decommissioning and implement remedial actions as required.		
Residual impacts: None, provided rehabilitation works are carried out as specified.		

6.3. Indirect Impacts

The indirect visual impacts of the proposed Komati Solar PV and BESS Facility are assessed as follows:

6.3.1. Operational Phase

6.3.1.1. The potential impact on the sense of place of the region

Sense of place refers to a unique experience of an environment by a user, based on his or her cognitive experience of the place. Visual criteria, specifically the visual character of an area (informed by a combination of aspects such as topography, level of development, vegetation, noteworthy features, cultural / historical features, etc.), play a significant role.

An impact on the sense of place is one that alters the visual landscape to such an extent that the user experiences the environment differently, and more specifically, in a less appealing or less positive light.

Since the greater environment has a strong mining and industrial character, interspersed with agricultural activities (maize crop production) and human settlements this highly developed landscape is not considered to have a high visual quality.

The anticipated visual impact of the proposed PV facility on the regional visual quality (i.e. beyond 6km of the proposed infrastructure and within the greater region), and by implication, on the sense of place, is difficult to quantify, but is generally expected to be of **low** significance (significance rating = 26).

Table 17: The potential impact on the sense of place of the region

Nature of Impact: The potential impact on the sense of place of the region.		
	No Mitigation	***Mitigation considered***
Extent	Long distance **(1)**	Long distance **(1)**
Duration	Long term **(4)**	Long term **(4)**
Magnitude	High **(8)**	High **(8)**
Probability	Improbable **(2)**	Improbable **(2)**
Significance	Low **(26)**	Low **(26)**
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No, only best practise measures can be implemented	
Generic best practise mitigation/management measures: Planning: ➢ Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude, but within the project site. Operations: ➢ Maintain the general appearance of the facility as a whole.		
Residual impacts: The visual impact will be removed after decommissioning, provided the facility infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.		

6.4. Cumulative Impact Assessment

6.4.1. The potential cumulative visual impact of the proposed development on the visual quality of the landscape

The proposed Komati Solar PV and BESS Facility is located within an area where a limited number of other PV facilities have been authorized within 30km of the site. There are no additional solar energy generation plants (or applications) within the study area itself and the closest approved application is the proposed installation of a solar photovoltaic power plant at the Eskom Duvha Power Station, some 18km north-west of the project site.

Of note is that the proposed site is located within an area where a large network of power lines traverses the study area and congregate at the existing Komati Power Station, as well as in an area where mining and other industrial activities are already one of the dominant industries.

The anticipated cumulative visual impact of the proposed Komati Solar PV and BESS Facility is expected to be of **low** significance *(significance rating = 26)*, especially when taking into consideration the existing visual disturbances brought about by the Komati Power Station and the various mines in close proximity of the proposed Komati Solar PV and BESS Facility.

Table 18: The potential cumulative visual impact of the proposed facility on the visual quality of the landscape

Nature of Impact: The potential cumulative visual impact of solar farms on the visual quality of the landscape.		
	Overall impact of the proposed project considered in isolation	***Cumulative impact of the project together with other infrastructure***
Extent	Medium distance **(2)**	Medium distance **(2)**

Duration	Long term **(4)**	Long term **(4)**
Magnitude	Moderate **(6)**	High **(8)**
Probability	Probable **(3)**	Improbable **(2)**
Significance	Moderate **(36)**	Low **(28)**
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No	
Mitigation measures: N.A.		
Residual impacts: The visual impact will be removed after decommissioning, provided the facility infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.		

6.5. The potential to mitigate visual impacts

The primary visual impact, namely the layout and appearance of the PV panels is not possible to mitigate. The functional design of the PV panels cannot be changed in order to reduce visual impacts.

The following mitigation is however possible:

- It is recommended that vegetation cover (i.e. either natural or cultivated) immediately adjacent to the development footprint be maintained, both during construction and operation of the proposed facility. This will minimise visual impact as a result of cleared areas and areas denuded of vegetation.

- Existing roads should be utilised wherever possible. New roads should be planned taking due cognisance of the topography to limit cut and fill requirements. The construction/upgrade of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems.

- In terms of onsite ancillary buildings and structures, it is recommended that it be planned so that clearing of vegetation is minimised where possible. This implies consolidating this infrastructure as much as possible and making use of already disturbed areas rather than undisturbed sites wherever possible.

- Mitigation of lighting impacts includes the pro-active design, planning and specification of lighting for the facility. The correct specification and placement of lighting and light fixtures for the proposed PV facility and ancillary infrastructure will go far to contain rather than spread the light. Mitigation measures include the following:

    - Shielding the sources of light by physical barriers (walls, vegetation, or the structure itself);
    - Limiting mounting heights of lighting fixtures, or alternatively using foot-lights or bollard level lights;
    - Making use of minimum lumen or wattage in fixtures;
    - Making use of down-lighters, or shielded fixtures;
    - Making use of Low-Pressure Sodium lighting or other types of low impact lighting.
    - Making use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.

- Mitigation of visual impacts associated with the construction phase, albeit temporary, would entail proper planning, management and rehabilitation of the construction site. Recommended mitigation measures include the following:

    - Ensure that vegetation adjacent to the development footprint (if present) is not unnecessarily cleared or removed during the construction period.
    - Reduce the construction period through careful logistical planning and productive implementation of resources wherever possible.
    - Plan the placement of laydown areas and any potential temporary construction camps in order to minimise vegetation clearing (i.e. in already disturbed areas) wherever possible.
    - Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.
    - Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.
    - Reduce and control construction dust through the use of approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent).
    - Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting wherever possible.
    - Rehabilitate all disturbed areas (if present/if required) immediately after the completion of construction works.

- Glint and glare impact mitigation measures include the following:

    - Use anti-reflective panels and dull polishing on structures, where possible and industry standard.
    - If specific sensitive visual receptors are identified during operation, investigate screening at the receptor site, where possible to mitigate glint and glare.
    - One airstrip, presumed to service the Komati Power Station was noted within the proposed development area of PV Site B. It is therefore assumed that this airstrip will no longer be in use following the development of PV Site B. However, should this airstrip still intend to be used then it is recommended that that a Glint and Glare Assessment be undertaken.

- During operation, the maintenance of the PV arrays and ancillary structures and infrastructure will ensure that the facility does not degrade, therefore avoiding aggravating the visual impact.

- Roads must be maintained to forego erosion and to suppress dust, and rehabilitated areas must be monitored for rehabilitation failure. Remedial actions must be implemented as and when required.

- Once the facility has exhausted its life span, the main facility and all associated infrastructure not required for the post rehabilitation use of the site should be removed and all disturbed areas appropriately rehabilitated, unless a new authorisation is granted for the plant to continue a new cycle. An ecologist should be consulted to give input into rehabilitation specifications.

- All rehabilitated areas should be monitored for at least a year following decommissioning, and remedial actions implemented as and when required.

- Secondary impacts anticipated as a result of the proposed PV facility (i.e. visual character and sense of place) are not possible to mitigate.

- Where sensitive visual receptors (if present), are likely to be affected it is recommended that the developer enter into negotiations with the property owners regarding the potential screening of visual impacts at the receptor site. This may entail the planting of vegetation, trees or the construction of screens. Ultimately, visual screening is most effective when placed at the receptor itself.

Good practice requires that the mitigation of both primary and secondary visual impacts, as listed above, be implemented and maintained on an ongoing basis.

7. IMPACT STATEMENT

The findings of the Visual Impact Assessment undertaken for the proposed Komati Solar PV and BESS Facility is that the visual environment surrounding the site, especially within a 1km radius (and potentially up to a radius of 3km) of the proposed facility, may be visually impacted during the anticipated operational lifespan of the facility (i.e. a minimum of 20 years).

The following is a summary of impacts remaining:

- Construction activities may potentially result in a **high** temporary visual impact, that may be mitigated to **moderate**
- The operation of the proposed PV facility is expected to have a **high** visual impact pre-mitigation and a **moderate** visual impact post mitigation on sensitive receptors within a 1km radius of the PV facility.
- The operational facility could have a **moderate** visual impact which may be mitigated to **low** on residents/visitors to the homesteads within 1 – 3km radius of the facility.
- The operational facility could have a **low** visual impact both before and after mitigation on residents/visitors to the homesteads within 3 – 6km radius of the facility.
- The operational facility could have a **low** visual impact both pre and post mitigation on sensitive receptors beyond the 6km radius of the facility.
- The anticipated lighting impact is likely to be of **moderate** significance and may be mitigated to **low** especially within 0-1km and potentially up to 3km radius of the PV and BESS Facility.
- The potential visual impact related to solar glint and glare as a road travel hazard is therefore expected to be of **moderate** significance both before and after mitigation for users of the R542 and R35.
- There are no affected residences within a 1km radius of the proposed PV facility. The potential visual impact related to solar glint and glare on static ground-based receptors (residents of homesteads) is therefore expected to be of **low** significance both pre and post mitigation.[10]
- The potential visual impact related to solar glint and glare on static ground-based receptors (residents of homesteads) is expected to be of a **high** significance which may be mitigated to **moderate**.
- The anticipated visual impact resulting from ancillary infrastructure is likely to be of **low** significance both before and after mitigation.
- Decommissioning activities may potentially result in a **moderate**, temporary visual impact both before and after mitigation.
- The anticipated visual impact of the proposed PV facility on the regional visual quality (i.e. beyond 6km of the proposed infrastructure and within the greater region), and by implication, on the sense of place, is difficult to quantify, but is generally expected to be of **low** significance.
- The anticipated cumulative visual impact of the proposed Komati Solar PV and BESS Facility is expected to be of **low** significance, especially when taking into consideration the existing visual disturbances brought about by the Komati Power Station and the various mines in close proximity of the proposed Komati Solar PV and BESS Facility.

[10] One airstrip, presumed to service the Komati Power Station was noted within the proposed development area of PV Site B. It is therefore assumed that this airstrip will no longer be in use following the development of PV Site B. However, should this airstrip still intend to be used then it is recommended that that a Glint and Glare Assessment be undertaken and that the impacts as assessed are amended.

The anticipated visual impacts listed above (i.e. post mitigation impacts) range from prominently **moderate** to **low** significance. Anticipated visual impacts on sensitive visual receptors (if and where present) in close proximity to the proposed facility are not considered to be fatal flaws for the proposed Komati Solar PV and BESS Facility.

8. CONCLUSION AND RECOMMENDATIONS

The visual impact assessment (VIA) practitioner takes great care to ensure that all the spatial analyses and mapping is as accurate as possible. The intention is to quantify, using visibility analyses, proximity analyses and the identification of sensitive receptors and the potential visual impacts associated with the proposed **Komati Solar PV and BESS Facility**. These processes are deemed to be transparent and scientifically defensible when interrogated.

The construction and operation of the proposed Komati Solar PV and BESS Facility may have a visual impact on the study area, especially within a 1km radius (and potentially up to a radius of 3km) of the proposed facility. The visual impact will differ amongst places, depending on the distance from the facility. Overall, the significance of the visual impacts is expected to range from **moderate** to **low,** as a result of the already disturbed and developed nature of the receiving environment.

The proposed Komati Solar PV and BESS Facility is located within an area where a limited number of other PV facilities have been authorized within 30km of the site. There are no additional solar energy generation plants (or applications) within the study area itself and the closest approved application is the proposed installation of a solar photovoltaic power plant at the Eskom Duvha Power Station, some 18km north-west of the project site. Since both of the other identified PV facilities are located more than 15km away from the proposed Komati Solar PV and BESS Facility, it is **not expected that a cumulative visual impact of significance will be experienced** by sensitive receptors within the region (within 30km).

Of note is that the proposed site is located within an area where a large network of power lines traverses the study area and congregate at the existing Komati Power Station, as well as in an area where mining and other industrial activities are already one of the dominant industries. It is generally acceptable, from a visual impact point of view, to place industrial infrastructure within existing industrial areas. Therefore, the **existing visual disturbances** brought about by the Komati Power Station and the various mines in close proximity of the proposed Komati Solar PV and BESS Facility to these, **somewhat mitigates the visual impact of the structures and activities**. Ironically this will also contribute to the potential cumulative visual impact of industrial infrastructure within the region. It is however still preferable to consolidate the proposed infrastructure in areas of existing visual disturbance, rather than to spread it over larger areas. Considering the above, and the generally disturbed nature of the area surrounding the site itself, the **potential cumulative visual impact is considered to be within acceptable limits**.

According to the Provincial Government of the Western Cape, Department of Environmental Affairs and Development Planning (DEA&DP) Guideline for Involving Visual and Aesthetic Specialists in the EIA Process (Oberholzer, 2005), the criteria that determine whether or not a visual impact constitutes a potential fatal flaw are categorised as follows:

1. Non-compliance with Acts, Ordinances, By-laws and adopted policies relating to visual pollution, scenic routes, special areas or proclaimed heritage sites.
2. Non-compliance with conditions of existing Records of Decision.
3. Impacts that may be evaluated to be of high significance and that are considered by the majority of the stakeholders and decision-makers to be unacceptable.

In terms of the above and to the knowledge of the author the proposed development is compliant with all Acts, Ordinances, By-laws and adopted policies relating to visual pollution, scenic routes, special areas or proclaimed heritage sites, as well as, conditions of existing Records of Decisions (if any in place).

Since no objections have been reported from stakeholders or decision-makers within the region to the knowledge of the author, this assessment has adopted a risk averse approach by assuming that the perception of most (if not all) of the sensitive visual receptors, would be predominantly negative towards the development.

Therefore, with the information available to the specialist at the time of writing this report, it cannot be empirically determined that the statistical majority of objecting stakeholders were exceeded. If evidence to the contrary surfaces during the progression of the development application, the specialist reserves the right to revise the statement below.

One airstrip, presumed to service the Komati Power Station was noted within the proposed development area of PV Site B. It is therefore assumed that this airstrip will no longer be in use following the development of PV Site B. However, should this airstrip still intend to be used then it is recommended that that a Glint and Glare Assessment be undertaken and that the impacts as assessed be amended.

A number of mitigation measures have been proposed (**Section 6.5**). Regardless of whether or not mitigation measures will reduce the significance of the anticipated visual impacts, they are considered to be good practice and should all be implemented and maintained throughout the construction, operation and decommissioning phases of the proposed facility.

If mitigation is undertaken as recommended, it is concluded that the significance of most of the anticipated visual impacts will remain at or be managed to acceptable levels. As such, the Komati Solar PV and BESS Facility would be considered to be acceptable from a visual impact perspective and can therefore be authorised.

It should be noted that the results/deductions in this report are based solely from a visual perspective in relation to potential visual impacts and sensitive visual receptors and exclude any potential issues/comments/fatal flaws identified by other specialist studies.

9. MANAGEMENT PROGRAMME

The following management plan tables aim to summarise the key findings of the visual impact report and to suggest possible management actions in order to mitigate the potential visual impacts. Refer to the tables below.

Table 19: Management programme – Planning.

OBJECTIVE: The mitigation and possible negation of visual impacts associated with the planning of the Proposed Komati Solar PV and BESS Facility.		
Project Component/s	The solar energy facility and ancillary infrastructure (i.e. PV panels, access roads, transformers, security lighting, workshop, power line, etc.).	
Potential Impact	Primary visual impact of the facility due to the presence of the PV panels and associated infrastructure as well as the visual impact of lighting at night.	
Activity/Risk Source	The viewing of the above mentioned by observers on or near the site (i.e. within 1km of the site) as well as within the region.	
Mitigation: Target/Objective	Optimal planning of infrastructure to minimise the visual impact.	
Mitigation: Action/control	**Responsibility**	**Timeframe**
Use anti-reflective panels and dull polishing on structures where possible and industry standard.	Project proponent / contractor	Early in the planning phase.
Plan the placement of laydown areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e. in already disturbed areas) wherever possible.	Project proponent / contractor	Early in the planning phase.
Retain and maintain natural vegetation (if present) immediately adjacent to the development footprint.	Project proponent/ design consultant	Early in the planning phase.
Make use of existing roads wherever possible and plan the layout and construction of roads and infrastructure with due cognisance of the topography to limit cut and fill requirements.	Project proponent/ design consultant	Early in the planning phase.

Plan all roads, ancillary buildings and ancillary infrastructure in such a way that clearing of vegetation is minimised. Consolidate infrastructure and make use of already disturbed sites rather than undisturbed areas.	Project proponent/ design consultant	Early in the planning phase.
Consult a lighting engineer in the design and planning of lighting to ensure the correct specification and placement of lighting and light fixtures for the PV Facility and the ancillary infrastructure. The following is recommended: o Shield the sources of light by physical barriers (walls, vegetation, or the structure itself). o Limit mounting heights of fixtures, or use foot-lights or bollard lights. o Make use of minimum lumen or wattage in fixtures. o Making use of down-lighters or shielded fixtures. o Make use of Low-Pressure Sodium lighting or other low impact lighting. o Make use of motion detectors on security lighting, so allowing the site to remain in darkness until lighting is required for security or maintenance purposes.	Project proponent / design consultant	Early in the planning phase.
Performance Indicator	Minimal exposure (limited or no complaints from I&APs) of ancillary infrastructure and lighting at night to observers on or near the site (i.e. within 3km) and within the region.	
Monitoring	Monitor the resolution of complaints on an ongoing basis (i.e. during all phases of the project).	

Table 20: Management programme – Construction.

OBJECTIVE: The mitigation and possible negation of visual impacts associated with the construction of the Proposed Komati Solar PV and BESS Facility.		
Project Component/s	Construction site and activities	
Potential Impact	Visual impact of general construction activities, and the potential scarring of the landscape due to vegetation clearing and resulting erosion.	
Activity/Risk Source	The viewing of the above mentioned by observers on or near the site.	
Mitigation: Target/Objective	Minimal visual intrusion by construction activities and intact vegetation cover outside of immediate construction work areas.	
Mitigation: Action/control	**Responsibility**	**Timeframe**
Ensure that vegetation cover adjacent to the development footprint (if present) is not unnecessarily removed during the construction phase, where possible.	Project proponent / contractor	Early in the construction phase.
Reduce the construction phase through careful logistical planning and productive implementation of resources wherever possible.	Project proponent / contractor	Early in the construction phase.
Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.	Project proponent / contractor	Throughout the construction phase.
Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.	Project proponent / contractor	Throughout the construction phase.

Reduce and control construction dust through the use of approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent).	Project proponent / contractor	Throughout the construction phase.
Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting, where possible.	Project proponent / contractor	Throughout the construction phase.
Rehabilitate all disturbed areas (if present/if required) immediately after the completion of construction works.	Project proponent / contractor	Throughout and at the end of the construction phase.
Performance Indicator	Vegetation cover on and in the vicinity of the site is intact (i.e. full cover as per natural vegetation present within the environment) with no evidence of degradation or erosion.	
Monitoring	Monitoring of vegetation clearing during construction (by contractor as part of construction contract). Monitoring of rehabilitated areas quarterly for at least a year following the end of construction (by contractor as part of construction contract).	

Table 21: Management programme – Operation.

OBJECTIVE: The mitigation and possible negation of visual impacts associated with the operation of the Proposed Komati Solar PV and BESS Facility.		
Project Component/s	The solar energy facility and ancillary infrastructure (i.e. PV panels, access roads, workshop, etc.).	
Potential Impact	Visual impact of facility degradation and vegetation rehabilitation failure.	
Activity/Risk Source	The viewing of the above mentioned by observers on or near the site.	
Mitigation: Target/Objective	Well maintained and neat facility.	
Mitigation: Action/control	**Responsibility**	**Timeframe**
Adjust tilt angles of the panels if glint and glare issues become evident where possible. If specific sensitive visual receptors are identified during operation, investigate screening at the receptor site.	Project proponent / operator	Throughout the operation phase.
Maintain the general appearance of the facility as a whole, including the PV panels, servitudes and the ancillary structures.	Project proponent / operator	Throughout the operation phase.
Maintain roads and servitudes to forego erosion and to suppress dust.	Project proponent / operator	Throughout the operation phase.
Monitor rehabilitated areas, and implement remedial action as and when required.	Project proponent / operator	Throughout the operation phase.
Investigate and implement (should it be required) the potential to screen visual impacts at affected receptor sites.	Project proponent / operator	Throughout the operation phase.
Performance Indicator	Well maintained and neat facility with intact vegetation on and in the vicinity of the facility.	
Monitoring	Monitoring of the entire site on an ongoing basis (by operator).	

Table 22: Management programme – Decommissioning.

OBJECTIVE: The mitigation and possible negation of visual impacts associated with the decommissioning of the Proposed Komati Solar PV and BESS Facility.	
Project Component/s	The solar energy facility and ancillary infrastructure (i.e. PV panels, access roads, workshop, transformers, etc.).
Potential Impact	Visual impact of residual visual scarring and vegetation rehabilitation failure.

Activity/Risk Source	The viewing of the above mentioned by observers on or near the site.		
Mitigation: Target/Objective	Only the infrastructure required for post decommissioning use of the site retained and rehabilitated vegetation in all disturbed areas.		
Mitigation: Action/control		**Responsibility**	**Timeframe**
Remove infrastructure not required for the post-decommissioning use of the site.		Project proponent / operator	During the decommissioning phase.
Rehabilitate access roads and servitudes not required for the post-decommissioning use of the site. If necessary, an ecologist should be consulted to give input into rehabilitation specifications.		Project proponent / operator	During the decommissioning phase.
Monitor rehabilitated areas quarterly for at least a year following decommissioning, and implement remedial action as and when required.		Project proponent / operator	Post decommissioning.
Performance Indicator	Vegetation cover on and in the vicinity of the site is intact (i.e. full cover as per natural vegetation within the environment) with no evidence of degradation or erosion.		
Monitoring	Monitoring of rehabilitated areas quarterly for at least a year following decommissioning.		

10.REFERENCES / DATA SOURCES

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