ENVIRONMENTAL IMPACT ASSESSMENT PROCESS - Draft Scoping Report

Prieska Power Reserve PV Plant & Associated Infrastructure, Northern Cape: Phase 1

GREEN-BOX CONSULTING

Prieska Power Reserve PV Plant & Associated Infrastructure, Northern Cape: Phase 1

Project Details

PROJECT TITLE:	Prieska Power Reserve PV Plant & Associated Infrastructure, Northern Cape: Phase 1
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Purpose of the Scoping Report

PRIESKA POWER RESERVE (PTY) LTD is a planning, managing, contracting, and financing facilitator for solar plants. It now also expands into wind energy and, in addition, also want to facilitate, at a much higher level, the establishment of downstream businesses.

An opportunity arose in 2014 for PRIESKA POWER RESERVE (PTY) LTD when access was gained to leasable land about 10 km southeast of Prieska in the Northern Cape. Since then, PRIESKA POWER RESERVE (PTY) LTD has undertaken feasibility investigations for the flexible production of green hydrogen and ammonia from variable solar and wind energy. Prieska and surrounding areas proof to have extremely good solar and wind load factors. PRIESKA POWER RESERVE (PTY) LTD developed a model to utilise these load factors to produce green ammonia of which the hydrogen content is derived from the renewable energy sources, Solar and Wind (energy production).

Planned industries for the Power Reserve Hub proposal in the Prieska area is anticipated to be developed in phase.

Phase 1: Development and construction of a PV plant with associated infrastructure;
Phase 2: Development and construction of a wind generation plant with associated infrastructure; and
Phase 3: Development and construction of an industrial park for green hydrogen and ammonia production.

This report deals with Phase 1, the development of a PV plant with its associated infrastructure.

PRIESKA POWER RESERVE (PTY) LTD is proposing the establishment of the solar electricity generating facility and associated infrastructure on a portion of the Remaining Extent of Erf 1 of the town of Prieska (RE/1) (refer to **Figure 1**). Prieska is in the Siyathemba Local Municipality. The energy facility is proposed to accommodate several arrays of single axis tracking photovoltaic (PV) panels and associated electricity infrastructure.

PRIESKA POWER RESERVE (PTY) LTD has appointed Green-Box Consulting as the independent environmental assessment practitioner to undertake the Environmental Impact Assessment (EIA) for the proposed facility. The EIA process is being undertaken in accordance with the requirements of the EIA Regulations of 2014 (as amended), promulgated in terms oof the National Environmental Management Act (NEMA: Act No. 107 of 1998).

The Draft Scoping Report represents the findings of the Scoping Phase of the EIA process and contains the following sections:

- Chapter 1 provides background to the proposed solar energy facility and the environmental impact assessment process.
- Chapter 2 describes the component of the proposed project.
- Chapter 3 outlines the process which was followed during the Scoping Phase of the EIA process and identifies project alternatives.
- Chapter 4 describes the existing biophysical and socio-economic environment affected by the proposed project.
- Chapter 5 provides a desktop assessment of the potential environmental and social impacts associated with the project.
- Chapter 6 provides the approach to the public participation followed.
- Chapter 7 describes the Plan of Study for EIA.
- Chapter 8 provides references used in the compilation of this Scoping Report.

Invitation to comment on the Draft Scoping Report

This Draft Scoping Report has been made available for public review at the following places, which lie in the vicinity of the proposed project area from **14 November – 15 December 2021.**

- Prieska Public Library;
- Prieska Municipal Offices.

The report is also available for download on:

- www.green-box.co.za

Please submit your comments to
Danie Krynauw of Green-Box Consulting P.O. Box 37738, Langenhovenpark, 9330 Tel: 082 435 2108 Email: info@green-box.co.za
The due date for comments on the Draft Scoping Report is **15 December 2021**

Comments can be made as written submission via post or email.

Report details

Title:	DRAFT SCOPING REPORT Prieska Power Reserve (Pty) Ltd
Purpose of this report:	This Draft Scoping report is available to all registered and potential Interested and Affected Parties (I&AP's) for Review and Comment. This Draft Scoping Report forms part of a series of reports and information sources that are being provided during the Environmental Impact Assessment (EIA) for the proposed Prieska Power Reserve PV Plant near Prieska in the Northern Cape Province. This is the first report in the series that that forms part of the environmental process. Registered I&APs will be given an opportunity to comment on the following reports as part of this environmental process: - Draft Scoping Report, - Draft Environmental Impact Assessment Report, and - Draft Environmental Management Programme In accordance with the regulations, the objectives of a scoping process is to, through a consultative process: (a) identify the relevant policies and legislation relevant to the activity; (b) motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location; (c) identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process; (d) identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment; (e) identify the key issues to be addressed in the assessment phase; (f) agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and (g) identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored. The Draft Scoping Report is available to all stakeholders for a 30 day review & comment period, 14 November – 15 December 2021.
Prepared for:	Prieska Power Reserve (Pty) Ltd
Published by:	Valozone 197 cc t/a Green-Box Consulting
Authors:	Mr. Danie Krynauw
Reviewed by:	Miss. Charissa Worthmann
Green-Box Consulting Ref:	38/P/2020/DK
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ACRONYMS USED IN THIS REPORT

CA	Competent Authority
CBA	Critical Biodiversity Areas
CBD	Central Business District
DFFE	Department of Forestry, Fisheries and Environment
DME	Department of Minerals and Energy
DMR	Department of Mineral Resources
EAPASA	Environmental Assessment Practitioners Association of South Africa
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ESA	Ecological Support Area
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
LED	Local Economic Development
NEMA	National Environmental Management Act of 1998 as amended
NBA	National Biodiversity Act
PPP	Public Participation Process
PSEIA	Plan of Study for Environmental Impact Assessment
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework
SMME	Small, Medium and Micro Enterprises
TOR	Terms of Reference

1. Main Report - Introduction

PRIESKA POWER RESERVE (PTY) LTD is proposing the establishment of a solar generating facility and associated infrastructure on a portion of the Remaining Extent of Erf 1, Prieska which is located within the Siyathemba Local Municipality in the Northern Cape (refer to **Figure 1**).

The solar energy facility is proposed to accommodate several arrays of tracking photovoltaic (PV) panels and associated infrastructure. From a regional perspective, this area is considered favourable for the development of solar electricity generating facilities by virtue of the climatic conditions (primarily as the economic viability of a solar energy facility is directly dependant on the annual direct solar irradiation value for a particular area), orographic conditions, relief and the extent of the site and the availability of direct transmission connection. The identified site is available for development, and has road access via the N10 national road, onto an existing track running along a powerline (Burchell-Copperton) towards the site.

The nature and extent of the facility, as well as potential environmental impacts associated with the construction, operation and decommissioning phases are explored in more detail in this Draft Scoping Report

1.1 Summary of the proposed development

The Prieska Power Reserve PV Plant & Associated Infrastructure is proposed to be established on a portion of the RE/1 of the Townlands of Prieska, which lies approximately 6km south of Prieska CBD (see **Figure 1**, Locality map).

The extent of the broader site is larger than the area required for the facility's development footprint. A proposed development footprint inclusive of associated infrastructure of <250ha can be appropriately placed within the boundaries of the broader site while aiming to avoid any environmental sensitivities identified throughout the EIA process. The facility can therefore be appropriately placed within the larger site taking any identified environmental constraints into consideration.

Installed hardware will deliver up to 170 MW ac by PV technology. Single-axis tracking panels will be used. The dominant height of the panels will be 3,00 metres. The following associated infrastructure will be included:

- Solar panels single axis,
- A 132 kV transmission line towards the Burchell substation will be constructed adjacent to the existing Burchell-Copperton 132 kV transmission line,
- Security towers and a utility building which will reach a height of up to 4,00 metres,
- Ablution facility,
- Internal access roads, and
- Perimetry fence, 3 meters high.

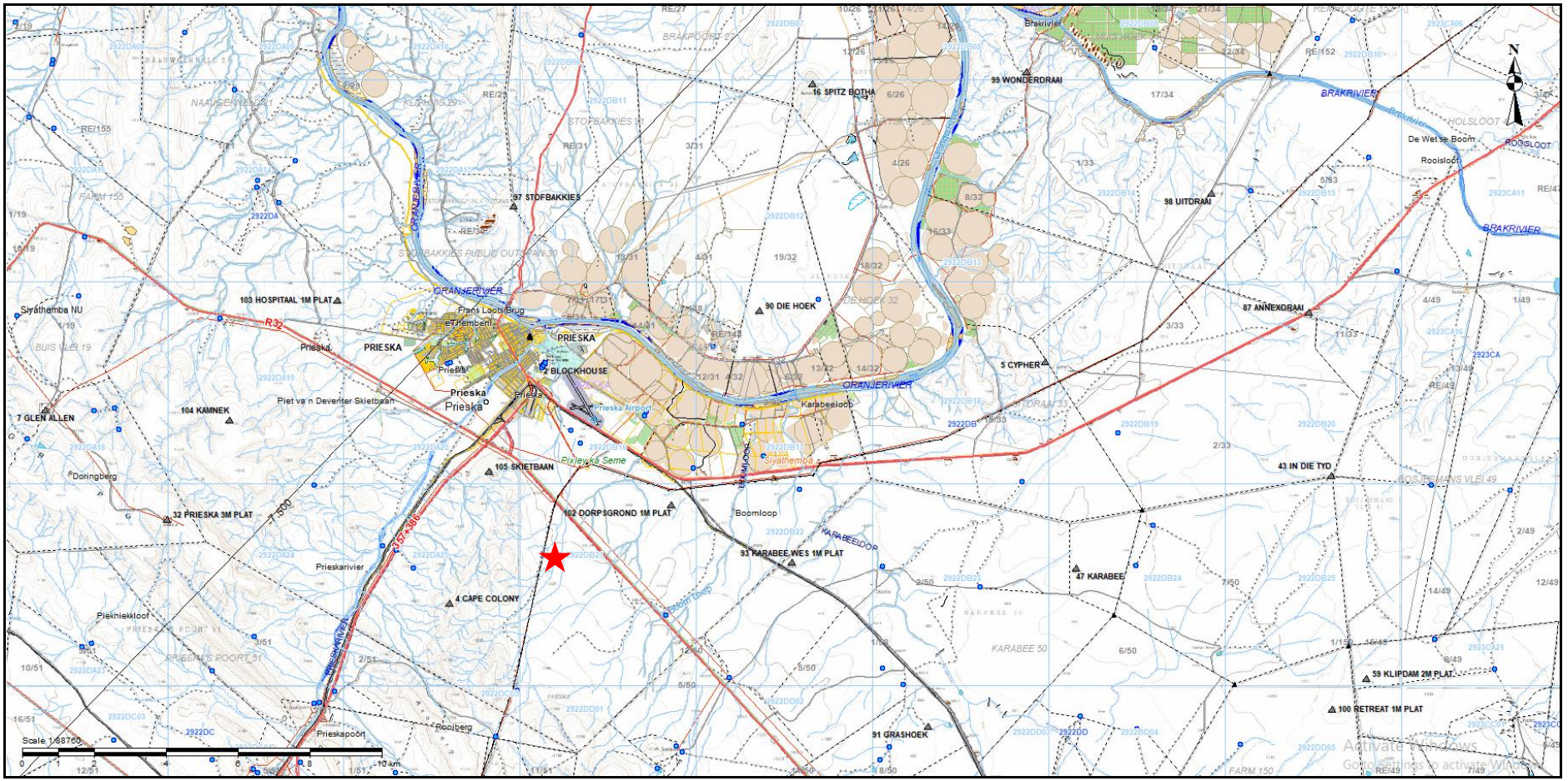

Figure 1: Location Map for the PRIESKA POWER RESERVE (PTY) LTD Solar Energy Facility (Planet GIS, 2021)

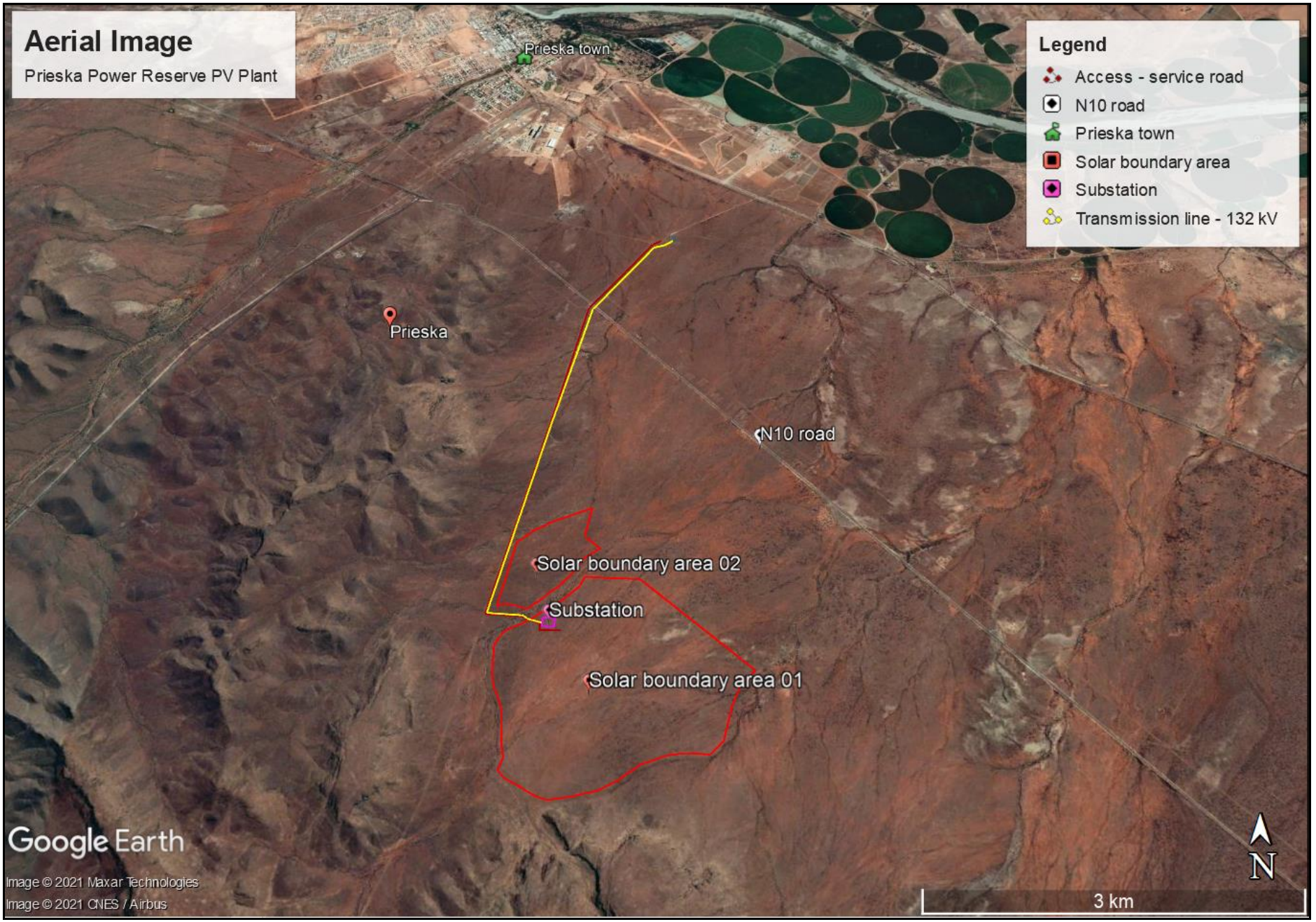

Figure 2: Aerial image for the PRIESKA POWER RESERVE (PTY) LTD Solar Energy Facility (Google Eart Pro, 2021)

The overarching objective for the solar energy facility is to maximise electricity production for the proposed ammonia and hydrogen manufacturing industry, as phase 2 of the Prieska Power Reserve Project. This can be achieved through exposure to the solar resource, while minimising infrastructure, operational and maintenance costs, as well as social and environmental impacts. In order to meet these objectives local level environmental and planning issues will be assessed through site-specific studies in order to delineate areas of sensitivity within the broader site, this will serve to inform the design of the facility.

The scope of the proposed Prieska Power Reserve PV Plant, including details of all elements of the project (for the design/planning, construction, operation, and decommissioning Phases) is discussed in more detail in Chapter 2.

1.2 Rational for the proposed Prieska Power Reserve PV Plant

The wide and arid expanses of the Northern Cape make for hard living and has become repellent to many industries for obvious reasons. The latest NCPSDF seems to harden this perception in the case of Prieska since the arguably justified intention of this planning document is to centralise the development and population in the main centres that will become developmental magnets. However, some industries cannot be manipulated in this manner since other elements are at play, e.g. the resource itself as with Copperton. The intersection of services and resources around Prieska where the Karoo Power Reserve Project is proposed, is a similar case. Hence the DFFE is requested to positively consider the imperatives of this locality in terms of its unique economic imperatives and not in terms of the centralisation that have its own merits elsewhere. Because of these available elements around Prieska establishing a new industrial market for green energy is a positive step towards economic growth for the town and immediate surrounding areas.

Electricity provision: Given the size of production planned (Solar: 170 MW phase 1) and being adjacent to a high-capacity transmission line, this production of electricity will justify establishment on its own.

However, the opportunity to bring energy-hungry industries with a zero-carbon footprint to the locality of generation should also be considered. Logistically such downstream industries could also benefit since a railway line with a siding skirt is located at Prieska including the N10 road that runs near the project leased land.

In the event that the project being developed, it will provide both economic stimulus to the local economy through the construction process and long-term employment in site management and operation and maintenance of the facility.

1.3 Need and Desirability

In keeping with the requirements of an integrated Environmental Impact process, the DFFE 7 Guidelines on Need and Desirability (2010 & 2011) were referenced to provide the following estimation of the activity in relation to the broader societal needs. The concept of need and desirability can be explained in terms of its two components, where need refers to time, and desirability refers to place. Questions pertaining to these components are answered in the Sections below.

The section above considers the overall need for alternative, so-called ‘green energy’ in light of the known environmental burdens associated with the impact of coal power generation through which most of our country’s electricity is currently being generated. Associated aspects such as air pollution, water use, and carbon tax are discussed in order to further explain the need and desirability for ‘green energy’ projects in general. The Prieska

Power Reserve PV Plant Phase 1 Project forms part of the broader hydrogen and green ammonia production project, the zero carbon Prieska Power Reserve Industrial Hub Project, aiming to shift from current energy systems to one that is better in terms of sustainability, environmental impact, climate change, human health, economics, employment, and social equity.

1.3.1 Feasibility consideration

The commercial feasibility for the proposed 170MW Prieska Power Reserve PV Plant to be built on municipal land near Prieska, has been informed by its contextual location, and economic, social and environmental impacts and influence to form the first phase of the broader Prieska Power Reserve Green Ammonia Production Project. The project has gathered sufficient information and conducted studies of the site and the region to make qualified and reliable assumptions on the project's various impacts. The proposed Project is in line with provincial development priorities to support the energy related enterprises and the green economy in the province.

The Prieska Power Reserve PV Plant is mere one step towards the creation of a green hydrogen production and distribution hub. The broader focus of PRIESKA POWER RESERVE (PTY) LTD, is to be in line with the recently developed, Northern Cape Green Hydrogen Strategy.

Extensions towards non-renewable energy generation during the night has been investigated through wind turbines and new technology battery storage, phase 2 of the broader Prieska Power Reserve Project. Location for an ammonia plant has also been considered near Prieska industrial area, making the contextual location of all components in and around Prieska feasible.

1.3.2 Solar Resources & Energy Production

The Northern Cape region is economically challenged due to its arid climate, challenging agricultural conditions, lack of water and limited natural resources (away from the Orange River). The Northern Cape is well-known for the large number of copper and zinc mines in the area, but since the early 1990's, many of these mines have closed down, leaving a devastating trail of unemployment behind.

The local economy, mainly supported by limited agriculture and mining activities, simply isn't enough to accommodate the high level of unemployment.

Private sector development is seen to offer opportunities to access Enterprise Development funds of the main mining groups. This can contribute to entrepreneurial activities linked to their supply chain. The same applies to the investment, in terms of employment opportunities and entrepreneurial activities, associated with renewable energy projects.

Power generation is one of the rare growth opportunities for the Northern Cape due to the high solar irradiation levels and its strategic position relative to the National Transmission Network. This setup creates unprecedented growth opportunities for the area and the establishment of a renewable energy project is considered important to diversify and compliment the economic development of the region.

1.3.3 Employment and Skills Transfer

The benefits of renewable energy facilities to local regions are not confined to the initial investment in the project. They also provide a reliable and on-going income for landowners and municipality, creating direct employment opportunities for locals, as well as flow-on employment for local businesses through provision of products and services to the project and its employees. It is exactly PRIESKA POWER RESERVE (PTY) LTD aim to utilise renewable energy sources in the region of Prieska to facilitate a green hydrogen (ammonia) industry.

PRIESKA POWER RESERVE (PTY) LTD will have a positive impact on local employment. Prieska Power Reserve Project jobs creation projection is as follow:

Table 1: Broader Prieska Power Reserve Project jobs creation projection

PRIESKA POWER RESERVE JOBS CREATED: PROJECTION		
ITEM	**CONSTRUCTION**	**OPERATION**
Solar	240	30
Wind	70	12
Hydrogen & Ammonia	100	46
Civils	25	25
Land Management		16
Security		24
Lodge		20
Visitor Centre & RSO		20
H2-Filling Station		12
TOTAL	**435**	**205**

During the estimated 18-month solar PV Plant construction phase, the project will employ approximately 240 individuals of various qualifications. The majority will be provided by the local labour market. During operations, the solar facility is expected to have up to 54 employment opportunities ranging from security staff to administration and artisans. Due the fact that there is no skilled labour in the field of renewable energy as yet, the employment structure will consist of local and overseas capacity. To guarantee successful operations over the lifetime of the investment, PRIESKA POWER RESERVE (PTY) LTD will likely use the skills of outside labour to cross-train local specialists. This cross training and skills development will take place especially in the area of technical maintenance and administration.

Note a Social Impact Assessment will be undertaken for this project and will be presented to I&AP's in the Impact Assessment phase of the environmental process. The baseline social study undertaken by SED Southern Economic Development is appended to this report.

1.3.4 Need (time)

Is the land use considered within the timeframe intended by the existing approved Spatial Development Framework (SDF)? (I.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP?

Yes, 'the employment of renewable energy technology' / development has a spatial strategic place in the Siyathemba Municipality SDF while the need for a policy on the development of sustainable solar energy farms has been identified as Key Development Priority / Project.

Should the development occur here at this point in time?

Yes, the proposed Prieska Power Reserve PV Plant is to be located outside the Prieska urban edge. Various other similar solar project is in the area. The Prieska Power Reserve PV Plant serve as phase 1 of the green hydrogen industry project, and serves to expand in the stream of sustainable renewable energy developments in the area (identified as a priority development strategy IDP & SDF).

Does the community / area need the activity and the associated land use concerned?

The Siyathemba Municipality identified the opportunity for a renewable energy project through their IDP processes, which include public participation. The proposed renewable energy development will allow for a diversification of employment, skills and contribute to the potential development of small business associated with its construction, operation and maintenance activities.

Are the necessary services with adequate capacity currently available?

Some existing, some new. Prieska Power Reserve PV Plant requires the installation of a 132 kV overhead distribution line to connect to the existing Eskom Substation as well as an access road to the development site from the N10. The cost of supplying the new infrastructure will be covered by the Applicant.

The water required for the construction and operation of the solar facility will be sourced from the Siyathemba Municipality and will be carted to the proposed site via water tankers and JoJo tanks (Proof of confirmation of availability will be included in the Environmental Impact Report).

Construction waste (General Waste) will be disposed of at the existing landfill site at Prieska - confirmation of capacity of the municipal landfill site to accept the estimated volumes of general waste will be included in the Draft Environmental Impact Report. Defunct and damaged panels identified during construction will be returned to the supplier for recycling and/or disposal.

Is this development provided for in the infrastructure planning of the municipality?

Yes. Attracting private investment and the employment of renewable energy development are identified as priority strategies to create sustainable urban and rural settlements. The opportunity to bring energy-hungry industries with a zero-carbon footprint to the locality of generation should also be considered. Logistically such downstream industries could also benefit since a railway line exist in the Prieska area.

Is this project part of a national programme to address an issue of national concern or importance?

Yes. In order to meet the increasing power demand within South Africa, Eskom has set a target of 30% of all new power generation to be derived from independent power producers (IPPs). In addition, Infrastructure South Africa (ISA) was established by Cabinet on the 27th of May 2020 under the Executive Authority of the Minister of

the Department of Public Works and Infrastructure. Infrastructure South Africa is responsible for developing a credible and robust project pipeline that stimulates aggregate demand, creates jobs, builds confidence in the economy and crowds in private sector funding for major public and private sector infrastructure projects.

Promoting commercially viable Green Hydrogen projects are a particular focus area for SA. In this regard, the Energy Technical Working Group has reviewed the Early Business Case submission for the Prieska Power Reserve Project. The Presidency Republic of South Africa supports the Prieska Power Reserve Project, with its various infrastructure development phases. A letter of support has been issued by the Investment and Infrastructure Office of the Presidency, on 16 August 2021) (see Appendix D).

1.3.5 Desirability (Place)

Is the development the best practicable environmental option for this land / site?

The target property is outside Prieska's Urban Edge and as such may not be considered for an alternative land use such as urban development. The property has a poor agricultural potential due to the arid climate inundation with black thorn trees and other limiting factors. These factors have rendered the property vacant with limited land use option alternatives.

Would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?

No. According to the IDP, attracting Renewable Energy Investment is seen as an IDP Strategy and economic driver to alleviate unemployment and poverty and "to ensure sustainable economic and social transformation in the district".

Do location factors favour this land use at this place?

Yes. The Northern Cape region has been identified as being one of the most viable for solar energy generation due to the following factors:

- Excellent solar radiation (compared to other regions).
- Close to existing main transport routes and access points.
- Close to connection points to the local and national electrical infrastructure.

The ecological sensitive areas on and surrounding the solar site have informed the optimal location and layout for the proposed solar project, with minimal impact to the receiving environment, subject to implementation of mitigation measures.

How will the activity or the land use associated with the activity applied for, impact on sensitive natural and cultural areas?

The alternatives considered for the solar development have been iteratively designed and informed by various investigations and assessments that considered both the natural and cultural landscapes. The natural and culturally sensitive areas have been identified and where possible, avoided to prevent negative impacts on such areas.

How will the development impact on people's health and wellbeing?

The site is located outside of the Prieska urban edge and as a result is unlikely to impact negatively on the community's health and wellbeing.

Will the proposed activity or the land use associated with the activity applied for, result in unacceptable opportunity costs?

Unlikely. The next best land use alternative to the solar facility is limited agriculture (the status-quo). However, the proposed solar development site does not have any significant agricultural value and has not been utilized for any intensive agricultural purposes. The carrying capacity of the site is too low to generate noteworthy financial benefit from agricultural activities. The development of the proposed solar facility would constitute the loss of less than 250ha of the overall property. The economic benefits and opportunities that the proposed solar development holds for the landowner and the local economy of the municipal area cannot be recovered from the current or potential agricultural activities. It is further the aim of the project to reinstate natural character of the area surface by limiting livestock overgrazing. Vegetation growth will continue under the solar arrays.

The opportunity costs in terms of the water-use requirements of the solar facility are within acceptable bounds if one considers the minimal demand on the resources.

Will the proposed land use result in unacceptable cumulative impacts?

Unlikely. Due to the fact that Northern Cape has been identified as an area with high potential for renewable energy generation: solar irradiation and availability of vast tracts of land with low sensitivity, there are a number of on-going applications in the region already. The potential for further, future solar developments in the area cannot be discounted (as a large number have already been approved or are in progress). However, these will have synergistic benefits for the economy and growth of the area, while the contribution to cumulative habitat loss in the area associated with this and potential future solar development would be relatively small in relation to the land resources available, with low impacts restricted to the local area.

1.4 Requirements of an Environment Impact Assessment Process

Section 24(4) of NEMA prescribes that the procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment must, *inter alia*, with respect to every application for environmental authorization, ensure that the general objectives of integrated environmental management laid down in NEMA and the NEMA Principles set out in NEMA are taken into account, and include an investigation of the potential consequences or impacts of the alternatives to the activity on the environment and assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity.

In terms of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) and the 2017 NEMA Environmental Impact Assessment (EIA) Regulations, promulgated in Government Gazette 40772 and Government Notice (GN) R326, R327, R325 and R324 on 7 April 2017, a full Scoping and EIA Process is required for the construction of the proposed Prieska Power Reserve PV Plant. PRIESKA POWER RESERVE (PTY) LTD has appointed Green-Box Consulting to undertake the EIA Process in order to determine the biophysical, social and

economic impacts associated with undertaking the proposed activities. Given that the energy generation from this proposed project aims to supply electricity to the bigger Prieska Power Reserve Project industrial phase the proposed Solar PV Facility requires authorisation from the Provincial Department of Agriculture, Environmental Affairs, Rural Development and Land Reform as the Competent Authority (CA), acting in consultation with other spheres of government.

As noted above, in terms of the EIA Regulations promulgated under Chapter 5 of the NEMA published in GN R326, R327, R325 and R324 on 7 April 2017, a full Scoping and EIA Process is required for the proposed project. The need for the full Scoping and EIA is triggered by, amongst others, by the inclusion of Activity 1 listed in GN R325 (Listing Notice 2):

- "The development of facility or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facility or infrastructure is for photovoltaic installations and occurs (a) within an urban area; or (b) on existing infrastructure".

The purpose of the EIA is to identify, assess and report on any potential impacts the proposed project, if implemented, may have on the receiving environment. The environmental assessment therefore needs to show the CA, and the project applicant, what the consequences of their choices will be in terms of impacts on the biophysical and socio-economic environment and how such impacts can be, as far as possible, enhanced or mitigated and managed as the case may be.

Government Notices R 324, R 325, R 326 and R 327, in Government Gazette No 40772 (dated 07 April 2017), in terms of Chapter 5 of the National Environmental Management Act, Act No 107 of 1998 (as amended), contain the EIA Regulations, as well as a schedule of activities that may have substantial detrimental effects on the environment and therefore require authorisation from the competent environmental authority. The listed activities that will be associated with the proposed construction of the 170 MW Prieska Power Reserve PV Plant and associated infrastructure include the following (see **Table 2**):

Table 2: Identified listed activities triggered by the Prieska Power Reserve PV Plant project

Listed Activity Number	Listed Activity Description	Description of the project activity that potentially triggers the relevant listed activity
GN R327		
Activity 11 (i)	The development of facilities or infrastructure for the transmission and distribution of electricity— (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.	The proposed facility will be required to evacuate electricity through a 132kV distribution line to a substation.
Activity 12 (ii) and (a), (c)	The development of— ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— a. within a watercourse; c. if no development setback exists, within 32 metres of a watercourse, measured from the	The proposed Solar PV facility and infrastructure will entail the construction of building infrastructure and structures (such as the solar field, electricity distribution line, laydown area and security enclosures etc.). Based on the preliminary sensitivity screening undertaken for the site, drainage features occur onsite, and the

	edge of a watercourse;	buildings and infrastructure are expected to exceed a footprint of 100 m^2 and some are likely to occur within 32 m of the watercourses. The proposed project will take place outside of an urban area. Additional information regarding the presence of watercourses on site will be confirmed by an Ecological Impact Assessment, which will be undertaken during the EIA Phase.
Activity 19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse	The proposed project will entail the excavation, removal and moving of more than 10 m^3 of soil, sand, or rock from the nearby identified drainage channels. The proposed project would also entail the infilling of more than 10 m^3 of material into the nearby watercourses. Based on the preliminary sensitivity screening undertaken for the site, drainage lines occur on the site.
Activity 28 (ii)	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.	The proportion land earmarked for the solar plant has an agricultural zoning. The proposed solar PV facility which is considered to be a commercial/industrial development, will have an estimated footprint of <250ha.
GN R325		
Activity 1	The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs — (a) within an urban area; or (b) on existing infrastructure.	The proposed project will entail the construction of a 170 MW Solar PV facility.
Activity 15	The clearance of an area of 20 hectares or more of indigenous vegetation.	The proposed solar PV facility will cover an estimated <250ha. It is anticipated that more than 20ha of the development site consist of indigenous vegetation. Additional information regarding the presence of indigenous vegetation on site will be provided in the Ecological Impact Assessment, which will be undertaken during the EIA Phase.
GN R324		
Activity 4 (g)(ii)(ee)	The development of a road wider than 4 metres with a reserve less than 13,5 metres. (g) Northern Cape. (ii) Outside urban areas.	A section of the proposed electricity connection line falls within a CBA2 area, access to the solar plant is proposed along the electricity line

	(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.	corridor.
Activity 12 (g)(ii)	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. (g) Northern Cape. (ii) Within critical biodiversity areas identified in bioregional plans.	The proposed PV facility will entail the construction of associated infrastructure such as an access road, and electricity connection line. A section of the electricity line corridor and access road falls within a CBA2 area. It is anticipated that more than 300 m² of vegetation will be removed for the installation of electricity pylons and access road.
Activity 14 (ii)(a)(g)(ii)(ff)	The development of— ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs— (a) within a watercourse; (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse. (g) Northern Cape, (ii) Outside urban areas, (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.	Construction of structures larger than 10m² within a watercourse or within 32 meters from a watercourse may be required.

The Environmental Impact Assessment Process is being conducted in two phases, *i.e.* an Environmental Scoping Study and an Environmental Impact Assessment (EIA), including an Environmental Management Programme (EMP). The sequence of documents, the legislative process, and opportunities to comment can be more clearly seen in the process flow chart following:

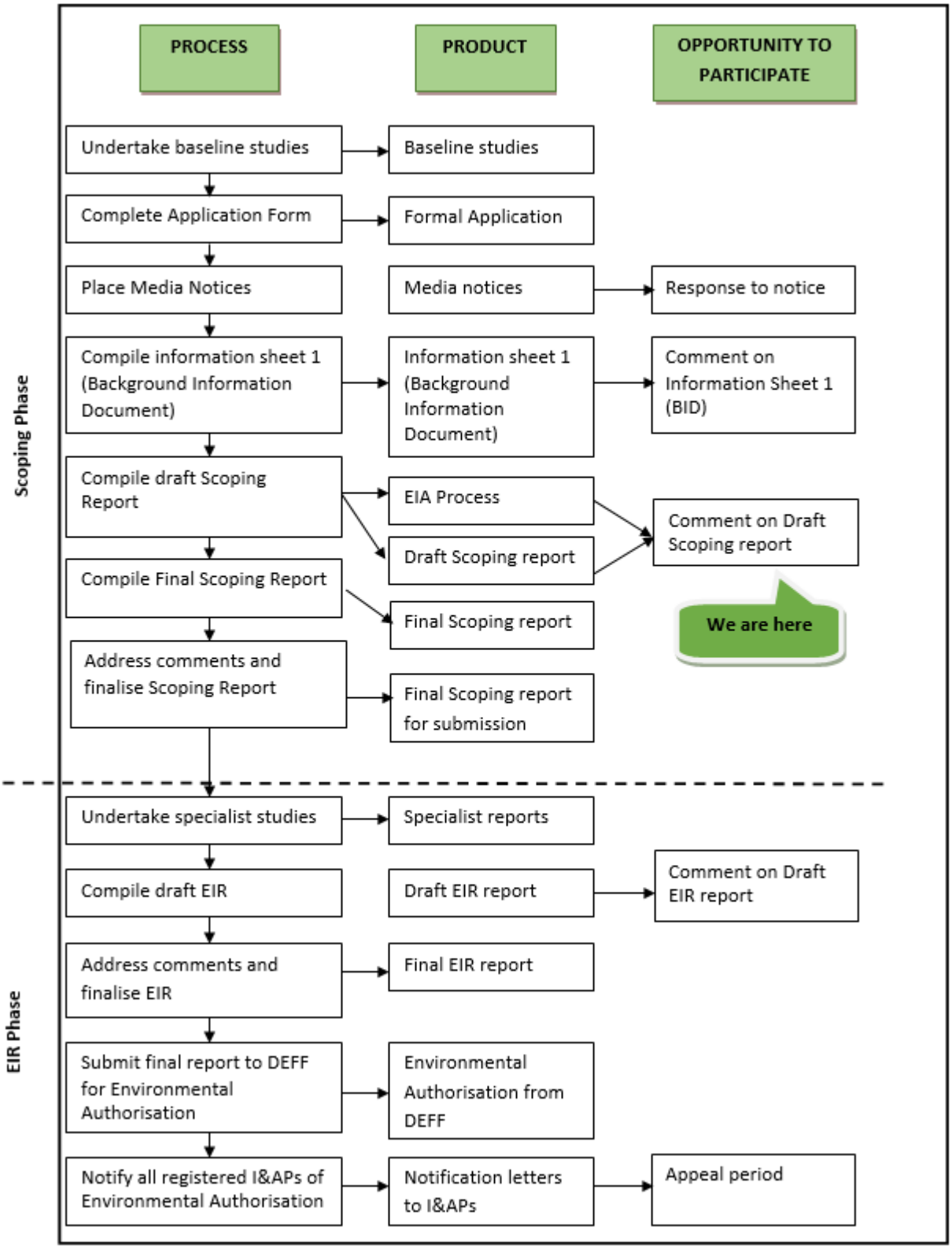

Figure 3: EIA Process Flow Chart

1.4.1 Scoping Process

The Scoping phase describes the preliminary decision-making processes regarding the project, including the investigation of development alternatives and the selection of preferred alternatives. The specific activities expected to form part of the proposed development is also described.

The study will then provide a description of the receiving environment and investigate how this environment may be directly, indirectly and cumulatively affected by the proposed development. Potential significant impacts (both economic, social and biophysical) that may result from the construction, operation and maintenance phases of the proposed development will be identified. Additional issues for consideration, identified during the first phase of the participatory and transparent Public Participation Process, which has been conducted concurrently with the scoping phase, will also be outlined and supporting documentation provided. This Scoping Study serve to identify any fatal flaws, gaps in knowledge, alternatives and mitigation alternatives for evaluation and investigation during the EIA phase of the project.

1.5 Details of the Environmental Assessment Practitioner and Expertise to conduct the Scoping and EIA Phase

Green-Box Consulting has been appointed by PRIESKA POWER RESERVE (PTY) LTD to undertake the EIA required for the proposed project. The EIA team which is involved in this Scoping and EIA Process is listed in Table 3 below. This team includes a number of specialists which have either been involved to date or are planned to provide inputs during the EIA Process.

Table 3: EIA Team

NAME	ORGANISATION	ROLE/STUDY TO BE UNDERTAKEN
ENVIRONMENTAL MANAGEMENT SERVICES		
Danie Krynauw	Green-Box Consulting	Lead EAP (EAPASA) Certified
Charissa Worthmann	Green-Box Consulting	Project Officer
SPECIALISTS		
Mr. Rikus Lampbrecht	Eco Focus	Ecological Impact Assessment
Dr. Lloyd Rossouw	Heritage	Heritage Impact Assessment (Archaeology, Palaeontology and Cultural Landscape)
Dr. Johan Van Niekerk	Ornithology	Avifauna Impact Assessment
Mr. Wian Esterhuizen	Visual	Visual Impact Assessment
Ms. An Kritzinger	Socio-Economic	Socio-Economic Impact Assessment

Danie Krynauw is the sole director and owner of Green-Box Consulting and has a Master's degree in Town and Regional Planning and completed studies in Environmental Management at the University of the Free State. D. Krynauw has over 18 years' experience in the environmental management field and is an EAPASA registered Environmental Assessment Practitioner (EAPASA – 2019/1348). He is also a member of the International Association of Impact Assessments South Africa. He has been project manager of several EIAs, Basic Assessments, Mining Permits and Water Use Licensing applications.

Danie will be supported by the EIA Team as outlined within Table 23.

2. PROJECT DESCRIPTION

This section provides an overview of the conceptual project design and an overview of the site and technology selection process for the Prieska Power Reserve PV Plant as provided by PRIESKA POWER RESERVE (PTY) LTD.

The purpose of this section is to present sufficient project information to inform the Scoping and EIA Process in terms of design parameters applicable to the project. It is important to note that the project description details are preliminary at this stage, and it is likely that some of the details presented herein may change during the detailed design phase and upon further investigations (including the findings and input of the specialist studies conducted during the EIA Phase of the proposed project). As noted previously, the proposed project will take place on a portion of the Remaining Extent of Erf 1, Prieska (Surveyor General 21-Digit Code: C06000030000000100000) near Prieska in the Northern Cape (Figure 1). The co-ordinates of the boundary/corner points of the preferred project site are shown in Table 3 and Figure 4 below.

Table 4: Co-ordinates of the corner points of the Preferred Project Site

Corner Point	Latitude	Longitude
Area 1		
1	29°44'36.14"S	22°46'32.03"E
2	29°44'6.51"S	22°45'54.99"E
3	29°44'5.30"S	22°45'36.74"E
4	29°44'25.35"S	22°45'9.59"E
5	29°45'6.01"S	22°45'12.28"E
6	29°45'14.71"S	22°45'27.67"E
7	29°45'02.21"S	22°46'03.03"E
Area 2		
1	29°43'54.96"S	22°45'41.58"E
2	29°43'50.90"S	22°45'36.31"E
3	29°43'40.37"S	22°45'38.50"E
4	29°43'52.99"S	22°45'13.19"E
5	29°44'14.68"S	22°45'8.30"E
6	29°44'15.35"S	22°45'18.51"E

2.1 Key Components of the Proposed Solar Facility

A summary of the key components of the proposed project is described below. It is important to note at the outset that the exact specifications of the proposed project components will be determined during the detailed engineering phase.

The project is being developed with a maximum possible installed capacity of 170 MW DC which produces 170 MW AC of electricity. The preferred project site includes approximately 384ha of land in total. Due to the fact that the solar PV facility requires <250ha of land there is spatial scope to avoid major environmental constraints through optimisation of the final design of the Solar Plant.

The two main components of the project will consist of the solar field (several arrays of photovoltaic (PV) solar panels) and the associated infrastructure. The technical components forming part of the solar facility are discussed below.

The solar facility will consist of the following components:

- Solar panels
- An onsite substation to step up the power
- Connection 132kV powerline that will connect directly into the existing Burchell substation
- Access road
- Security towers and a utility building, with ablutions
- Perimeter fencing and internal security

Technical Aspects

The conversion of sunlight to usable electrical energy has been referred to as the *Photovoltaic Effect*. Solar panels collect solar radiation from the sun and actively convert that energy to electricity. Solar panels are comprised of several individual solar cells. These solar cells function similarly to large semiconductors and utilize a large-area p-n junction diode. When the solar cells are exposed to sunlight, the p-n junction diodes convert the energy from sunlight into usable electrical energy. The energy generated from photons striking the surface of the solar panel which allows electrons to be knocked out of their orbits and released, and electric fields in the solar cells pull these free electrons to provide direct current (DC) to alternative Current (AC) of the desirable voltage to achieve the design of 170MW capacity.

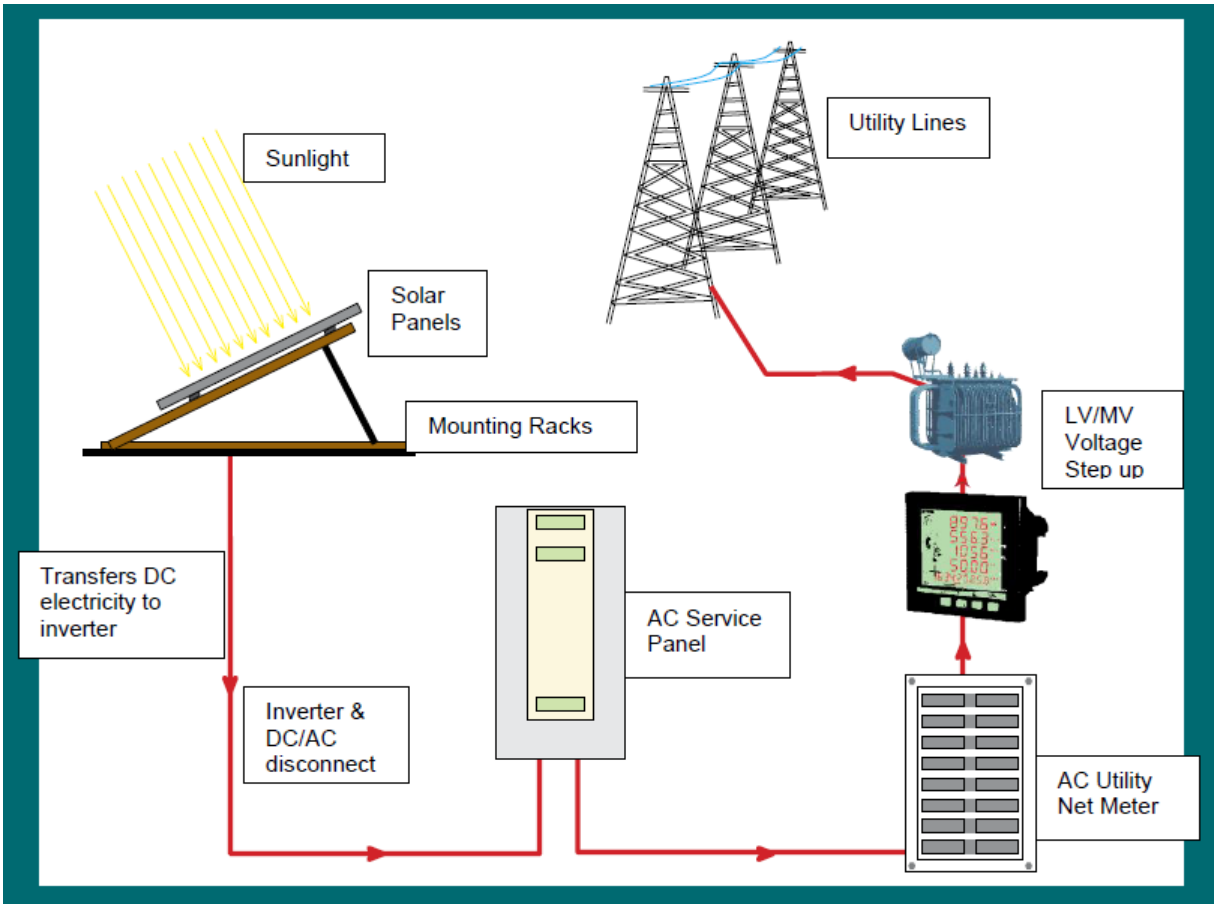

Figure 5: Overview of a Solar PV Power Plant (Source: IFC, 2012)

The most important parts of Photovoltaic systems are the cells which form the basic building blocks of the unit, collecting the sun's light. The PV cells to be used for the 170MW solar plant are made from crystalline silicon.

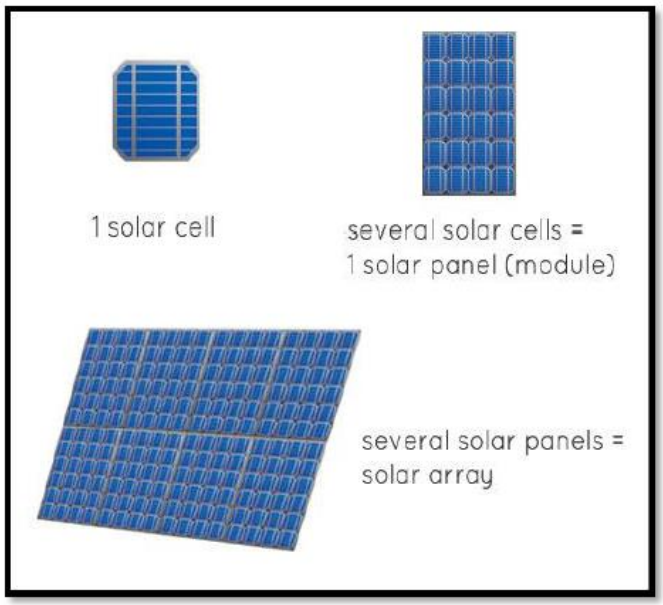

Figure 6: Photovoltaic Cells, modules, panels, and arrays (Source: Go Greena, 2013))

Solar panels are created by cutting crystalline silicon into tiny disks less than a centimetre thick (Figure 6). These thin, wafer-like disks are then carefully polished and treated to repair and gloss any damage from the slicing process. After polishing, dopants and metal conductors are spread across each disk. The conductors are aligned in a thin, grid-like matrix on the top of the solar panel, and are spread in a flat, thin sheet on the side facing the earth.

To protect the solar panels after processing, a thin layer of cover glass is then bonded to the top of the photovoltaic cell. After the bonding of protective glass, the nearly finished panel is attached to a substrate by expensive, thermally conductive cement. The thermally conductive property of the cement keeps the solar panel from becoming overheated; any leftover energy that the solar panel is unable to convert to electricity would otherwise overheat the unit and reduce the efficiency of the solar cells.

- ✓ *Photovoltaic Solar Plant Components*

A plant is made up of the following components:

(i) PV modules that are generally connected together in series to produce strings of modules of a higher voltage. These strings may then be connected together in parallel to produce a higher current direct current (DC) input to the inverters;

(ii) Module mounting systems that allow the PV modules to be securely attached to the ground at the desired angle to the sun;

(iii) Power centre, custom figured for the system which will include low distortion inverter which are electronic devices that transform direct current (DC) generated by the PV modules into alternating current (AC), and interconnect with incoming ESKOM power and a connection to the breaker panel;

(iv) System data monitor which shows how much energy is flowing in from the energy sources and how much is flowing out to the loads;

(v) A balance of system hardware consisting of wiring, terminations, ground fault interrupter, surge protection, DC and AC disconnects;

(vi) System data monitor which shows how much energy is flowing in from the energy sources and how much is flowing out to the loads; and

(vii) A balance of system hardware consisting of wiring, terminations, ground fault interrupter, surge protection, DC and AC disconnect.

- ✓ *Mounting (Single and Dual Axis Tracker)*

These are the only moving parts in a photovoltaic power plant as they follow the sun as it moves across the sky. Single axis trackers have one degree of freedom, i.e., they can alter either the orientation or the tilt angle whilst the dual axis alters both the orientation and the tilt angle. According to IFC, 2012, the annual energy yield of the single and dual axis can be increased by up to 27% and 37% respectively. Tracking mounting systems are expensive to install and maintain.

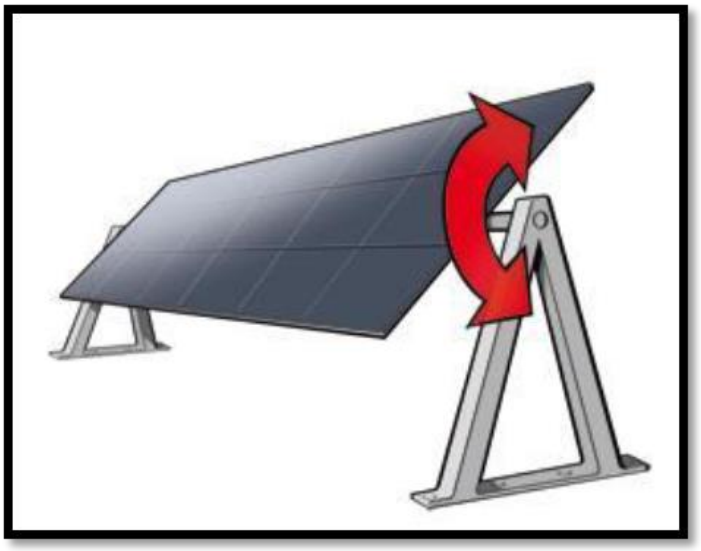

Figure 7: Tracking mounting systems

2.2 Overview of Project Development Cycle

2.2.1 Solar Power Plant Construction

In order to construct the proposed solar energy facility and associated infrastructure, a series of activities will need to be undertaken. The construction process is discussed in more detail below.

Prior to initiating construction, a number of surveys will be required including, but not limited to:

- Geotechnical survey – the geology and topography of the development footprint will be surveyed. The geotechnical study will focus on foundation conditions, potential for excavations, and the availability of natural construction materials. Thew geotechnical examination will include surface and subsurface exploration, soil sampling and laboratory analysis.
- Site survey – will be done for the finalisation of the design layout of the solar arrays, and other infrastructure. The micro-siting footprint will consider any environmental sensitivity identified during the EIA Phase investigations and will need to be confirmed in line with the Environmental Authorisation issued for the facility.

The construction of the plant is expected to take up to 36 months with a project lifespan of 30 years or more. Approximately 240 individuals will be employed on site and the procurement of local labour will be according to the labour laws and social development laws of South Africa. The main works for the construction of the solar plant include the following:

i. Site establishment (this will also include a lay-down area measuring 10mx5m which will be used for the storage of materials during construction). This will be converted to a permanent lay-down area during the operation phase;
ii. Erection of security fences;
iii. Foundation construction;
iv. Module assembly;
v. Mounting frame construction;

vi. Line construction and line connection;
vii. Electrical site works; and
viii. Access road construction.

The following associated activities are included:

Site establishment -
Site preparation activities will include clearance of vegetation at the footprint of each project component. These activities will require the stripping of topsoil which will need to be stockpiled, backfilled and/or spread on site.

Transport of components and equipment to site –
The component and equipment required for the construction of the proposed facility will be brought to site in sections by means of national and provincial roads and then proposed internal access road. The existing gravel track access to the project site running parallel to an existing powerline will be upgraded to accommodate construction vehicle traffic and serve as permanent access to the PV Plant site.

Establishment of laydown areas on site –
Laydown and storage areas will be required for the typical construction equipment which will be required on site. Once the required equipment has been transported to site, a dedicated equipment construction camp and laydown area will need to be established adjacent to the workshop area. The laydown area will be used for the assembly of the PV panels and the general placement/storage of construction equipment.

Establishment of ancillary infrastructure –
Ancillary infrastructure includes a 132kV overhead power line feeding into the existing Burchell substation. The establishment of the overhead powerline will require the clearing of vegetation and levelling of the development site and the excavations prior to construction of the pylons.

On full commissioning of the facility, any access points to the site which are not required during the operational phase must be close and rehabilitated. All temporary facilities, equipment and waste materials will be removed from site.

Undertake site remediation –
Once construction is completed and once all construction equipment is removed, the site must be rehabilitated where practical and reasonable.

2.2.2 Solar Power Plant Operation

A solar plant needs low maintenance, and this will consist of scheduled preventative maintenance which are planned in advance and aimed to prevent faults from occurring, as well as to keep the plant operating at an optimum level. The following activities will be undertaken:

i. Module cleaning;
ii. Checking module connection integrity;
iii. Inverter servicing;
iv. Inspecting mechanical integrity of mounting structures;

v. Vegetation control; and
vi. Routing balance of plant servicing.

2.2.3 Solar Power Plant Decommission

The PV plant will be decommissioned at the end of the 30-40 years. The following activities will be carried out:

i. Removal of solar panel structures and all appurtenant above ground equipment;
ii. Restoration of the disturbed soil and re-vegetation of the site to its pre-construction condition with native vegetation similar to plants in the surrounding vicinity;
iv. Restoration of roads to their pre-construction condition unless the land owner elects to retain the improved roads for access throughout that land owner's property; and
v. Removal of permanent operations and maintenance building.

The dismantled panels consisting of silicon, aluminium and the electrical wiring will be recycled to make new modules.

3. PROJECT ALTERNATIVES

This section identifies and describes the alternative infrastructure options and motivation for site and site selection for the proposed project. In terms of the NEMA EIA Regulations, one of the criteria to be taken into account by the competent authority when considering an application is "any feasible and reasonable alternatives to the activity which is the subject of the application and any feasible and reasonable modifications or changes to the activity that may minimise harm to the environment". Alternatives are defined in the Regulations as "different means of meeting the general purpose and requirements of the activity". It is therefore necessary to provide a description of the need and desirability of the proposed activity and any identified alternatives to the proposed activity that are feasible and reasonable, including the advantages and disadvantages that the proposed activity or alternatives will have on the environment and on the community that may be affected by the activity.

The "feasibility" and "reasonability" of an alternative will therefore be measured against the general purpose, requirements and need of the activity and how it impacts on the environment and on the community that may be affected by the activity. It is therefore vital that the identification, investigation and assessment of alternatives address the issues/impacts of a proposed PV Plant.

There are two types of alternatives – Fundamental Alternatives and Incremental Alternatives.

Fundamental Alternatives -
Fundamental alternatives are developments that are totally different from the proposed project and usually involve a different type of development on the proposed site, or a different location for the proposed development.

Different types of developments –

3.1 Land-use Alternatives

3.1.1 Agriculture

At present the proposed site is zoned for agricultural land-use, and is mainly used for livestock grazing. The agricultural potential is uniformly low to medium across the preferred and alternative sites and the choice of placement of the proposed facility on the selected portion of Erf 1 Prieska therefore has minimal influence on the significance of agricultural impacts. Hence, agricultural land use is not a preferred alternative.

3.1.2 Renewable Energy Alternatives

Where the "activity" is the generation of electricity, possible reasonable and feasible land-use alternatives for the proposed property include, Biomass, and Wind Energy. However, based on the preliminary investigations undertaken by the Project Applicant, no other renewable energy technologies are deemed to be appropriate for the site. The unsuitability of other renewable energy developments for the site, as well as the potential risks and impacts of each, is discussed below.

Biomass Energy

The proposed project site lacks any abundant or sustainable supply of biomass. According to the South African Renewable Energy Resource Database (SARERD), the project site is identified as having no cumulative biomass energy potential (as shown in Figure 8), therefore, the implementation of a Biomass Facility at the proposed site is therefore considered to be an unfeasible alternative to the implementation of the proposed solar PV energy facility. Should biomass energy be selected for the site, significant negative socio-economic implications could be created as it would not be feasible in terms of operations. A biomass facility is also likely to result in unnecessary pollution due to waste generation (especially wastewater generated during the operational phase).

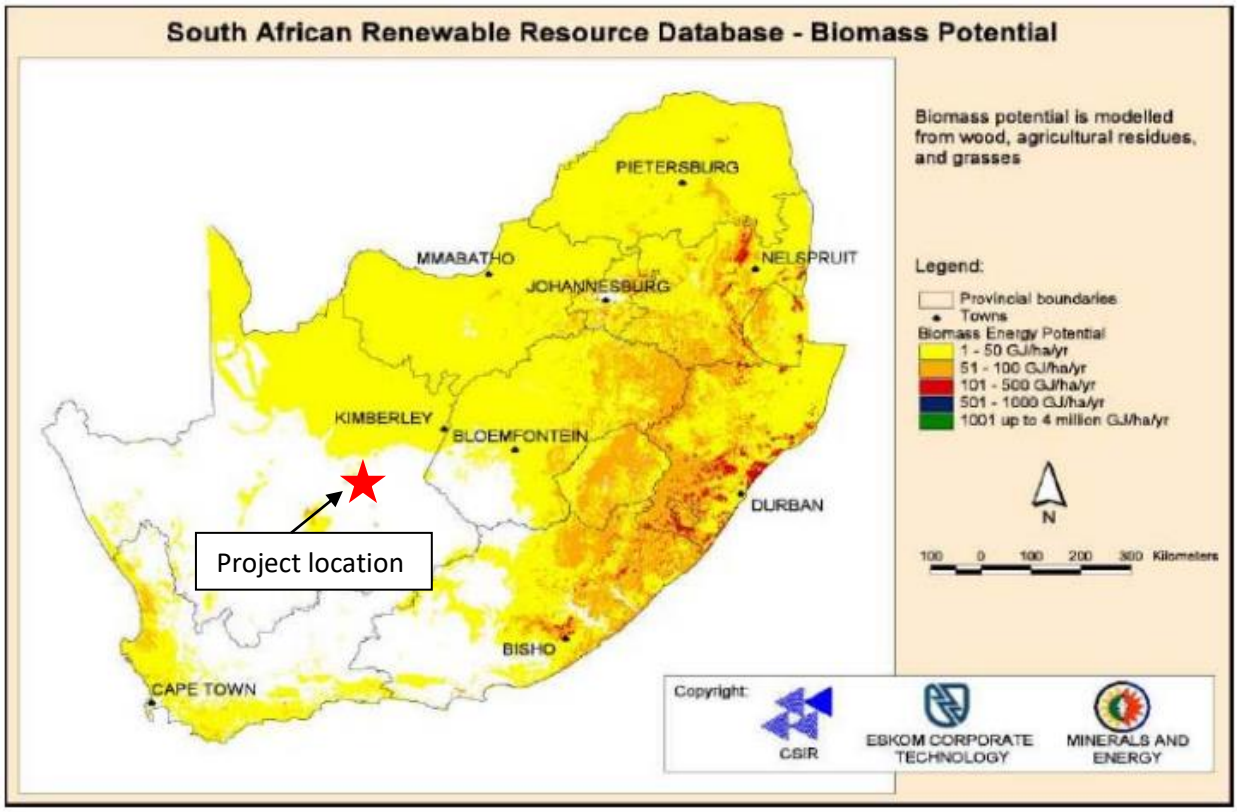

Figure 8: South African renewable resource database – Biomass (DME, 2003)

Wind Energy

Wind energy is considered to be the most feasible alternative to solar energy when compared to biomass and or hydro energy; however, the site-specific requirements of wind energy facilities make it a less feasible alternative when compared to solar PV. It has been calculated that wind consistence in the surrounding Prieska area is best at a higher altitude. Since there is only a certain amount of land available for the Solar PV phase 1 project, the implementation of a wind energy facilities would not make optimum use of that land which is available. PRIESKA POWER RESERVE (PTY) LTD is however of intention to incorporate wind energy possibilities for the bigger Prieska Power Reserve Project, as a phase 2 project.

Solar Energy

- National Level Considerations: Solar Radiation

The north-western part of South Africa has the highest Global Horizontal Irradiation1 (GHI), relevant to PV installations (Figure 9) and Direct Normal Irradiance2 (DNI), relevant to CPV and tracking PV installations. The central part of SA ranks second highest. Therefore, this section of South Africa is deemed the most suitable for

the construction and operation of solar energy facilities as opposed to other areas and provinces within South Africa. For example, coastal regions within KwaZulu-Natal, Eastern Cape and Western Cape mainly have a solar radiation between 1500 kWh/m^2 and 1700 kWh/m^2 per annum, which is not completely feasible for the proposed projects. On the other hand, the Northern Cape (the area with the predominant red shading in Figure 9) has a solar radiation of 2800 kWh/m^2 per annum, which is the second highest level. Various developers have received several approvals for PV facilities on farms surrounding Prieska, which shows and justifies the suitability of this area for this type of development.

For this reason, no fundamental alternatives will be investigated.

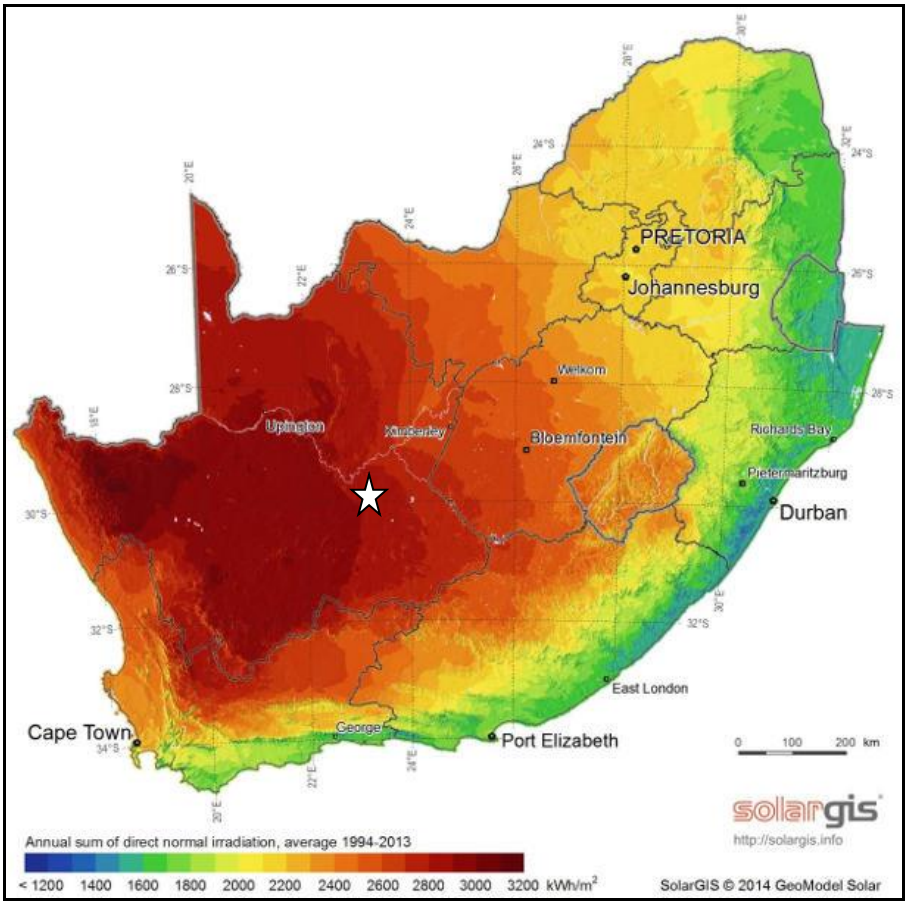

Figure 9: Updated Direct Normal Solar Irradiation (DNI) map of South Africa, (Source: Solar GiS, 2014)

3.2 Technology Alternatives

3.2.1 Mounting

- Fixed

These are structures where the solar modules are mounted at a fixed inclination which is calculated to provide the optimum annual output profile. The fixed tilt angle and orientation is generally optimised for each plant according to location as it helps to maximise the total annual incident irradiation and total annual energy yield. The tilt angle for the proposed site is between 0º and 30º facing true north. Fixed tilt mounts are generally cheaper, simple and have a low maintenance cost.

Figure 10: Fixed Tilt Mount

- Single and Duel Axis Tracker

These are the only moving parts in a photovoltaic power plant as they follow the sun as it moves across the sky. Single axis trackers have one degree of freedom, i.e., they can alter either the orientation or the tilt angle whilst the dual axis alters both the orientation and the tilt angle. According to IFC, 2012, the annual energy yield of the single and dual axis can be increased by up to 27% and 37% respectively. Tracking mounting systems are expensive to install and maintain.

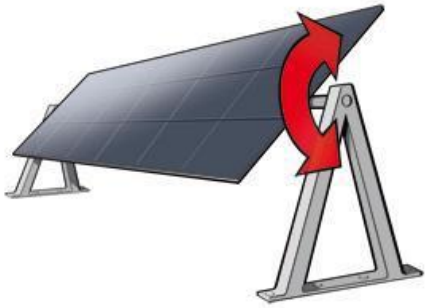

Figure 11: Single axis tracker

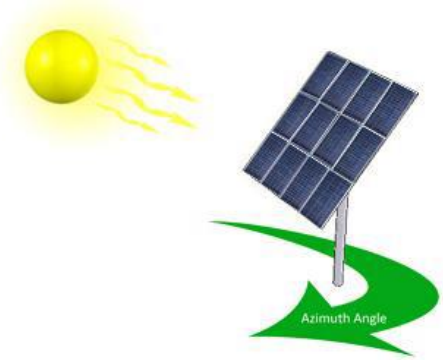

Figure 12: Dual axis tracker

3.2.2 Foundations

- Pre-cast concrete ballasts

It is suitable even at places where the ground is difficult to penetrate due to rocky outcrops or subsurface obstacles. This option has low tolerance to uneven or sloping terrain but requires no specialist skills for installation. Consideration must be given to the risk of soil movement or erosion.

- Driven piles

Pile foundations are the part of a structure used to carry and transfer the load of the structure to the bearing ground located at some depth below ground surface. The main components of the foundation are the pile cap and the piles. Piles are long and slender members which transfer the load to deeper soil or rock of high bearing capacity avoiding shallow soil of low bearing capacity. If a geotechnical survey proves suitable, a beam or pipe driven into the ground can result in low-cost, large-scale installations that can be quickly implemented. Specialist skills and pile driving machinery are required; these may not always be available.

- Earth screws

Helical earth screws typically made of steel have good economics for large scale installations and are tolerant to uneven or sloping terrain. These require specialist skills and machinery to install

3.3 Layout Alternatives

The findings of the specialist studies will be used to inform the layout within the development footprint of the project. The specialist studies that will be conducted during the EIA Phase will identify the various environmental sensitivities present on site that should be avoided, which will be taken into account during the determination of the proposed layout of the PV facility.

The aim of the EIA Phase (in terms of the layout of the proposed facility), will be to determine a buildable area for the proposed project within the development footprint of the site, which will be assessed by the specialists and considered during the EIA Phase. It is already foreseen through a preliminary area sensitivity assessment that the proposed less than 250ha footprint required will be accommodated within the available property boundaries, considering avoidance of sensitive environmental receptors.

Incremental alternatives will therefore be considered and assessed for this project. Modifications or variations to the design of the project that provide different options to reduce or minimise environmental impacts will be assessed. There are several incremental alternatives that will be considered, including:

- The design or layout of the activity;
- The technology to be used in the activity, and
- The operational aspects of the activity.

3.4 No-Go Action Alternative

The description of the baseline or existing environment or status quo is essential to all environmental assessments, and should be focussed on the key characteristics of, and values or importance attached to the environment. The baseline, or ‘no-go’ option, as well as all other relevant alternatives must be described,

assessed, and evaluated at the same scale and level of detail that enables adequate comparison with the proposed project. If no solar project is constructed on the proposed site, the area will remain in its existing condition with no structures or facilities being constructed or operated. It would also lessen the PRIESKA POWER RESERVE (PTY) LTD larger project proposal to materialise in developing green energy through ammonia and hydrogen manufacturing. not A detailed assessment of the advantages and the disadvantages of not proceeding with the proposed 170 MW Solar Power Plant will be assessed during the environmental impact phase.

4. DESCRIPTION OF AFFECTED ENVIRONMENT

This Section of the Scoping Report provides an overview of the affected environment for the proposed Free State Strategic Solar project and the surrounding region. The receiving environment is understood to include biophysical, socio-economic and heritage aspects which could be affected by the proposed development or which in turn might impact on the proposed development.

This information is provided to identify the potential issues and impacts of the proposed project on the environment. The information presented here has been sourced from:

- Scoping input from the specialists that form part of the project team;
- Review of information available on the South African National Biodiversity Institute (SANBI) Biodiversity Geographical Information System (BGIS) and Agricultural Geo-Referenced Information System (AGIS);
- DEFF Screening tool; and
- Siyathemba Local Municipality, Pixley Ka Seme District Municipality IDPs and the Northern Cape PSDF.

It is important to note that this chapter intends to provide an overview and does not represent a detailed environmental study. Detailed studies focused on significant environmental aspects of this project within the development footprint of the project will be provided during the EIA Phase.

4.1 Regional Setting: Location of Study Area

The project is situated in Siyathemba Local Municipality (SLM) which falls under the Pixley Ka Seme District Municipality. The project is approximately 6km south of Prieska town south of the provincial road the R357 and west of the N10 (the national road to Upington). The Municipality is located within the central eastern parts of the Northern Cape Province on the banks of the Orange River, and falls within the boundaries of the Pixley Ka Seme District. The nearest business centre is Kimberley, which is about 220km away.

The main settlements in the Siyathemba Local Municipality are the towns of Prieska, Marydale, Niekerkshoop, Draghoender and Coppeton.

4.2 Biophysical Environment

4.2.1 Climatic Conditions

The climate of the area is typical of the desert and is categorised as arid. The rainfall of the region peaks during the summer months and the Mean Annual Precipitation (MAP) of the area is approximately 244 mm (www.climate-data.org). The maximum average monthly temperature is approximately 26.9°C in the summer months while the minimum average monthly temperature is approximately 9.8°C during the winter. Maximum daily temperatures can reach up to 34.6°C in the summer months and dip to as low as 1°C during the winter.

4.2.2 Topography and Landscape

The study area is situated on land that has a west – east elevation that varies from 1055 to 1021m above sea level. From north to south the site slopes between 1034 and 1095m above sea level. The average slope of the site is calculated at 2.1%. The majority of the assessment area constitutes a relatively natural flat to slightly sloping landscape, while only the most southerly portion of the assessment area possesses a slightly increased topographic gradient, towards the foot slope of the mountain range to the south. The assessment area and broader surrounding flat bottomland areas to the north and east, are utilised by local informal subsistence farmers/land users for livestock grazing purposes.

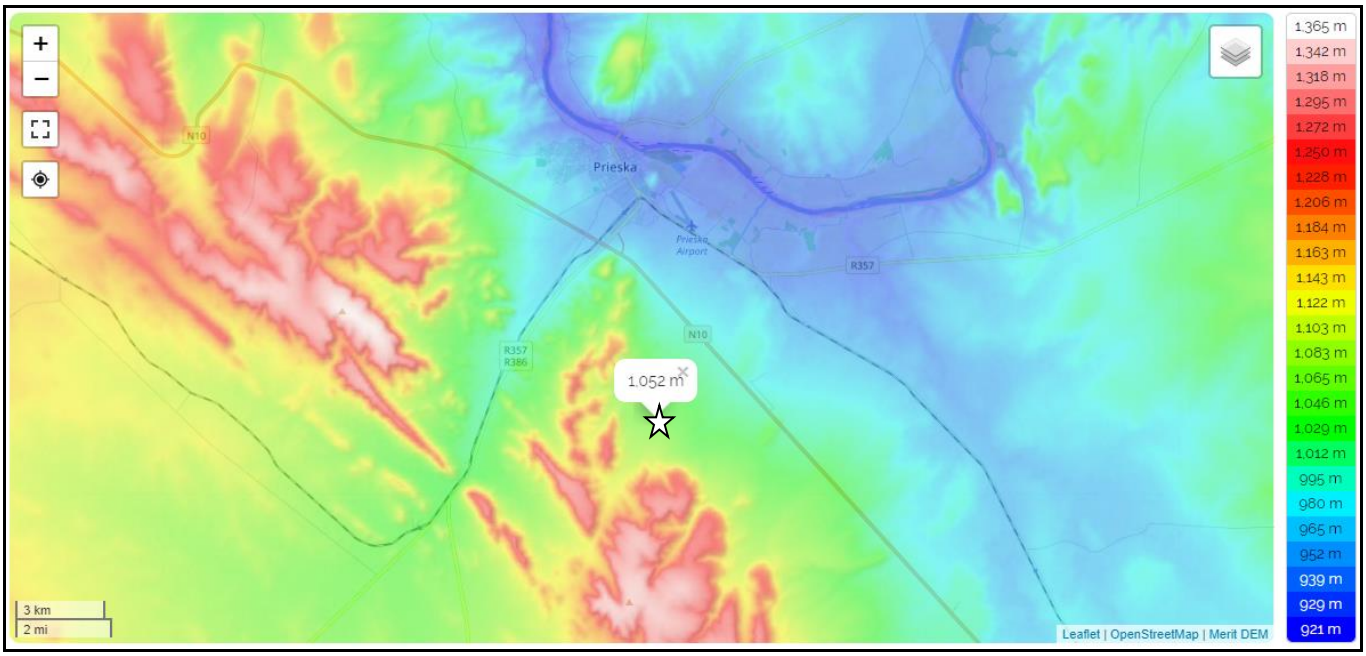

Figure 13: Elevation map of the Prieska area, average elevation 1052m (https://en-za.topographic-map.com/maps/77oq/Prieska/)

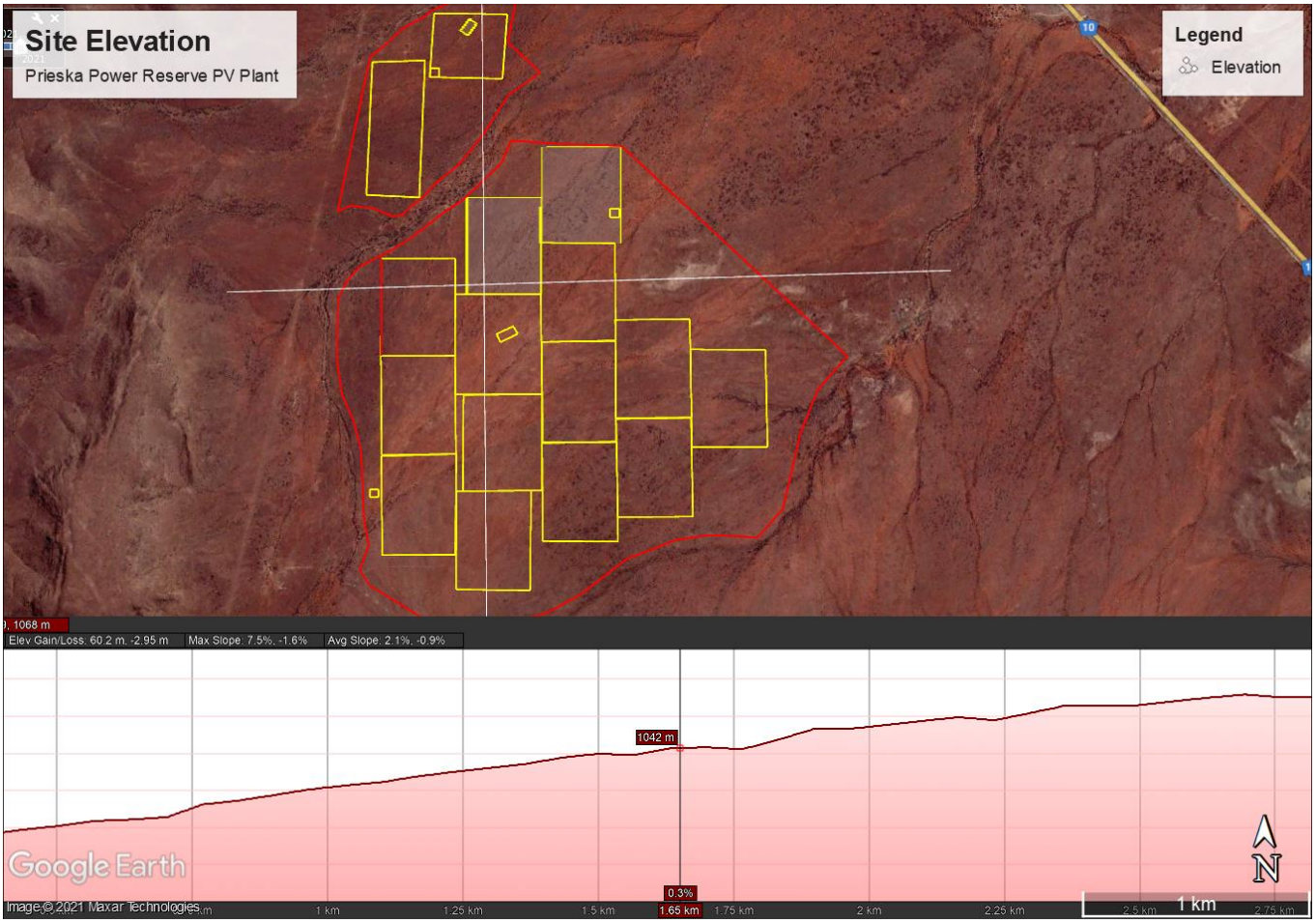

Figure 14: West to easte elevation profile of the development area (Google Inc., 09/2021)

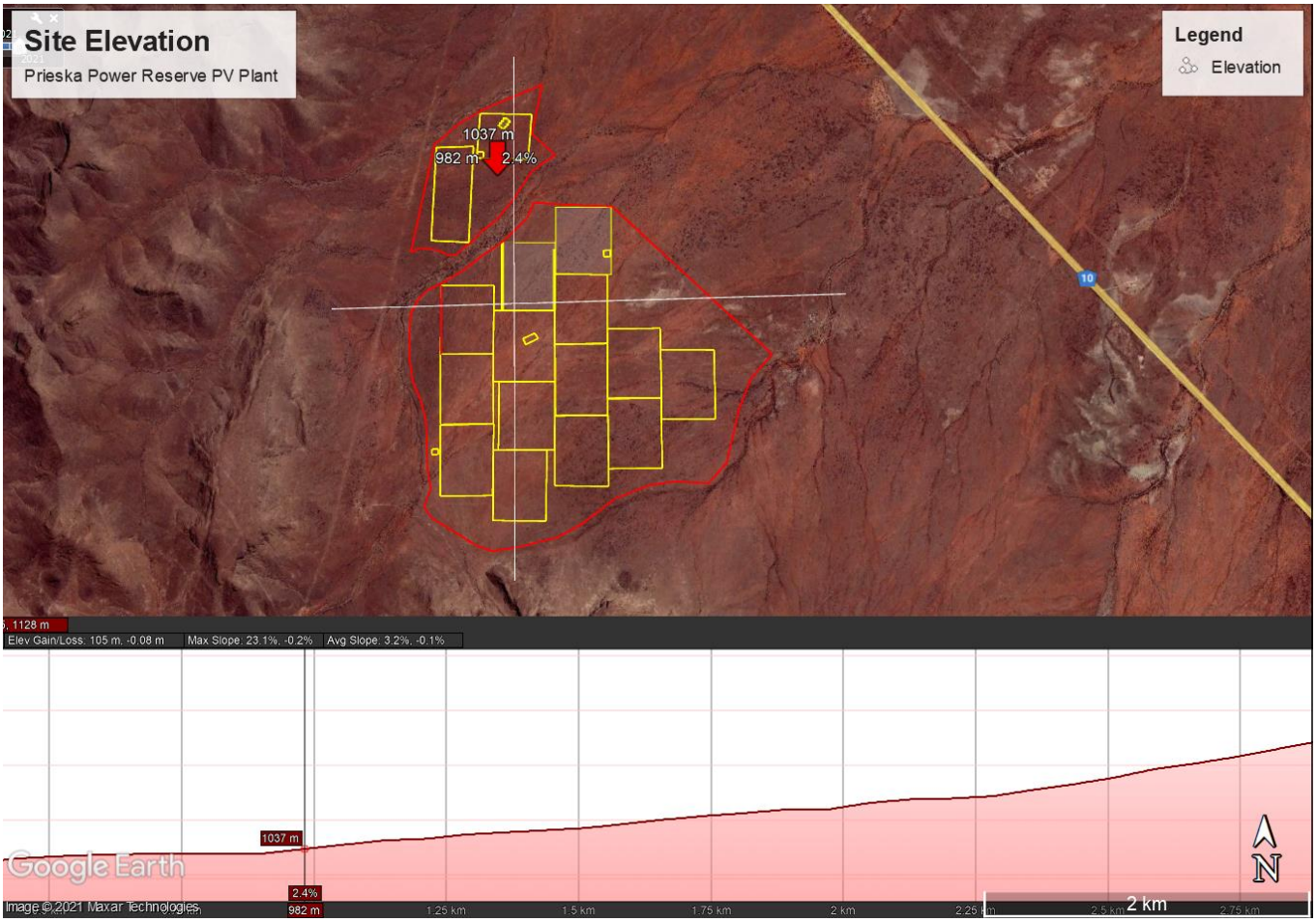

Figure 15: North to south elevation profile of the development area (Google Inc., 09/2021)

4.2.4 Regional Geology

According to Mucina & Rutherford (2006) the main geology of the landscape and associated vegetation type can be described as the following:

The assessment area as well as the associated substation, transmission line and access/service road are mainly covered by recent alluvium and calcrete. Superficial deposits of the Kalahari Group are also present. Soils are mostly red-yellow apedal and free-draining, mainly of Ag and Ae land types.

4.2.5 Soil Types and Soil Potential

Soils with minimal development, usually shallow, on hard or weathering rock, with or without intermittent diverse soils, freely drained, structureless soils. Lime generally present in part or most of the landscape.

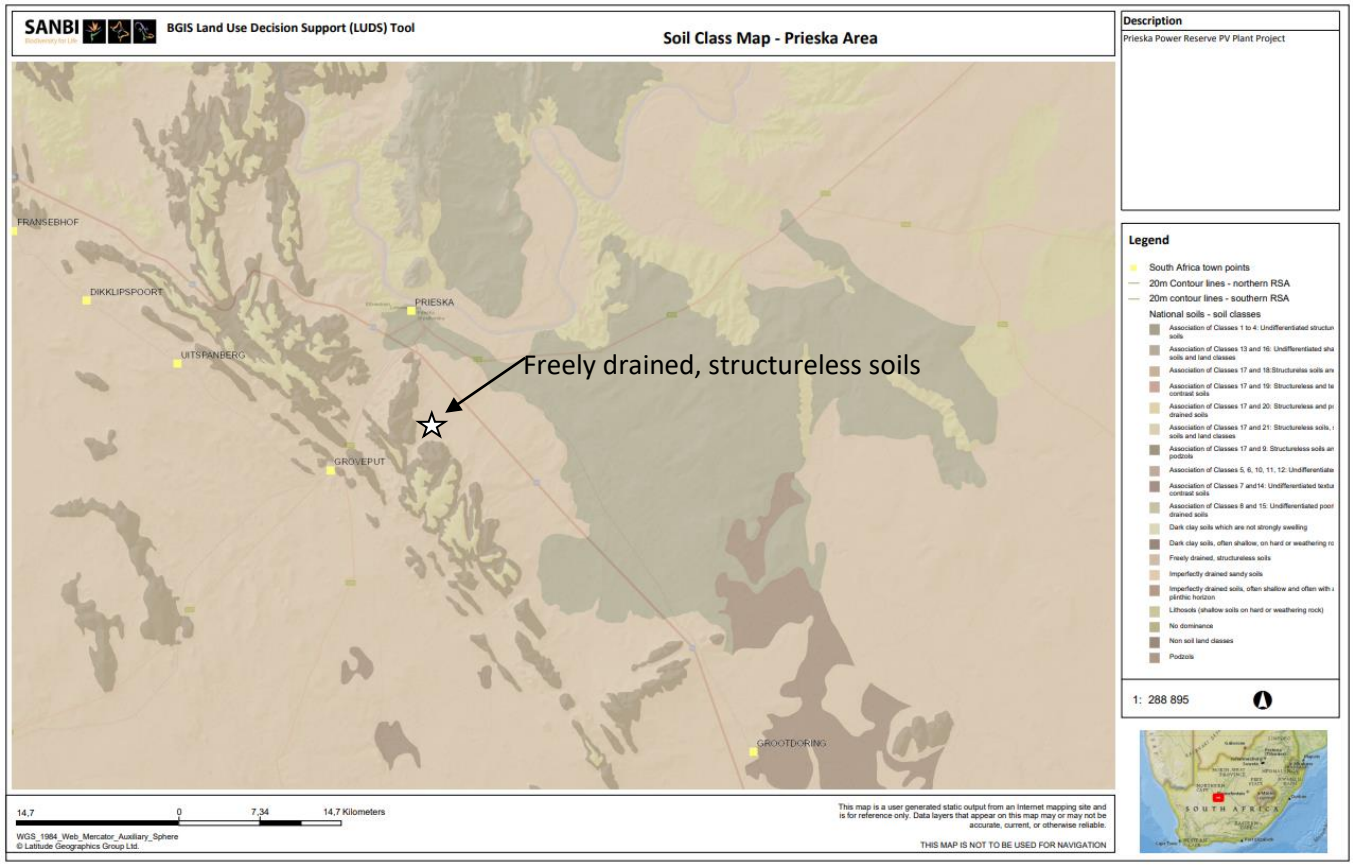

Figure 16: Soil map of the Prieska area (Sanbi BGiS)

4.2.6 Vegetation Type

According to SANBI (2006-2019), the entire assessment area as well as the associated substation, transmission line and access/service road all fall within the Bushmanland Arid Grassland vegetation type (NKb 3). This vegetation type mainly consists of extensive to irregular plains on a slightly sloping plateau sparsely vegetated by grassland and mostly dominated by white grasses such as Stipagrostis species. The vegetation type has the characteristics of semi desert (SANBI, 2006-2019). This vegetation type is classified as Least Concerned (SANBI, 2006-2019).

The extensive mountain range to the south and west of the assessment area forms part of the Lower Gariep Broken Veld vegetation type (NKb 1), which mainly consists of hills and low mountains, slightly irregular plains with some rugged terrain (SANBI, 2006-2019). The sparse vegetation is mainly dominated by shrubs and dwarf shrubs with perennial grasses and herbs. Groups of scattered low tees such as Aloe dichotoma and Senegalia mellifera occur on slopes of koppies and on sandy soils of foot slopes. This vegetation type is classified as Least Concerned (SANBI, 2006-2019).

'Ground truthing' during the site assessments suggests that the assessment area rather forms part of a transitional zone between the arid grassland- and karroid shrubland landscapes within the broader area.

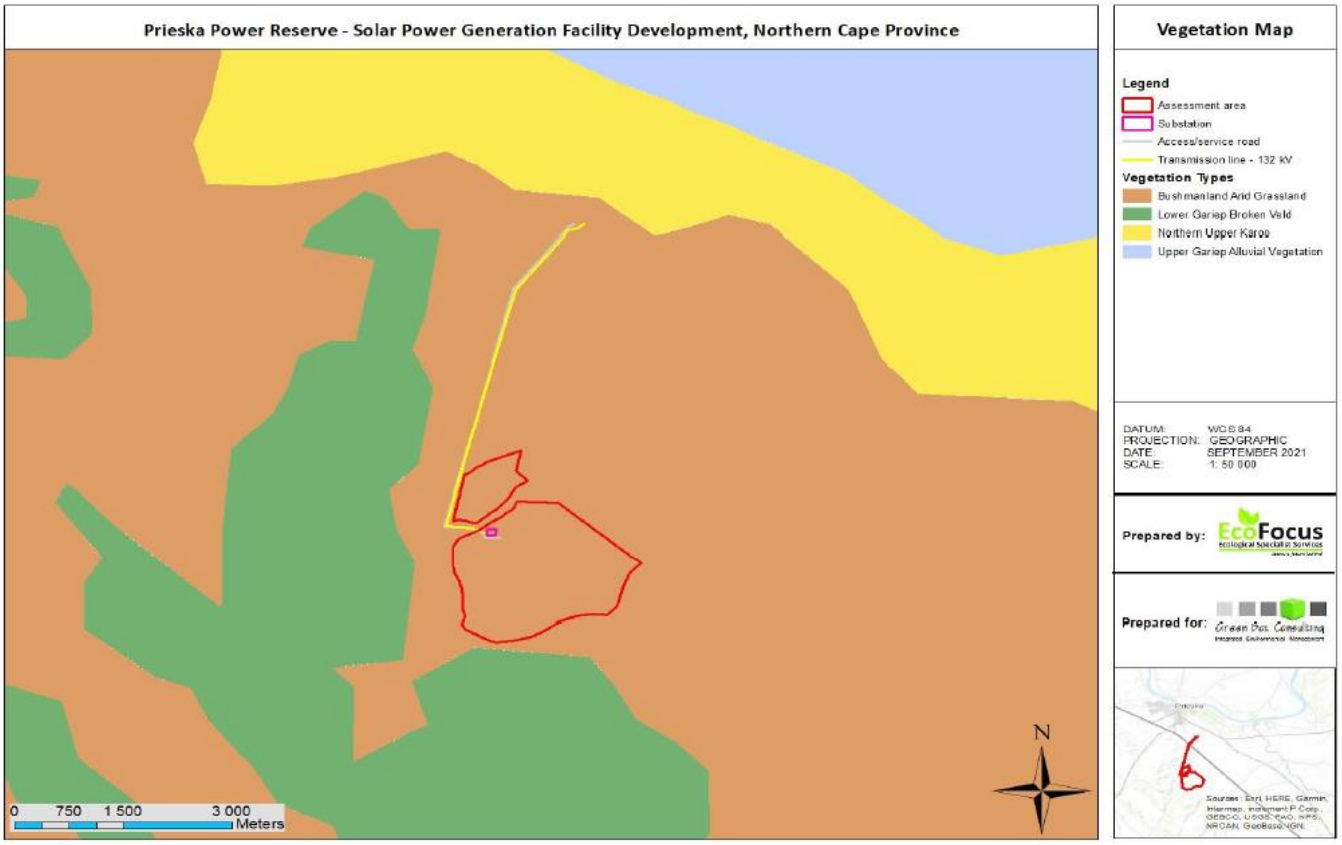

Figure 17: Vegetation map illustrating the vegetation type associated with the assessment area as well as the 132 kV electrical transmission line and access/service road

4.2.7 Conservation Status

The entire assessment area as well as the southern half of the associated transmission line and access/service road form part of a broad mosaic of Ecological Support Area (ESA) and Other Natural Area (ONA), in accordance with the Northern Cape Provincial Spatial Biodiversity Plan 2016 (NCPSBP), which sets out biodiversity priority areas in the province. ESA's are areas that must be maintained in at least fair ecological condition (semi-natural/moderately modified state) in order to support the ecological functioning of a Critical Biodiversity Area (CBA) or protected area, or to generate or deliver ecosystem services, or to meet remaining biodiversity targets for ecosystem types or species when it is not possible or not necessary to meet them in natural or near-natural areas (Collins, 2018).

The northern half of the associated transmission line and access/service road however falls within a Critical Biodiversity Area two (CBA 2), in accordance with the NCPSBP 2016. CBA 2 are areas that have been selected as the best option for meeting biodiversity targets based on complementarity, efficiency and/or avoidance of conflict with other land or resource uses (Collins, 2018).

It must also be noted that the formally protected Prieska koppie- and Die Bos Nature Reserves are both located approximately 6.5 km north of the assessment area.

See conservation status maps below.

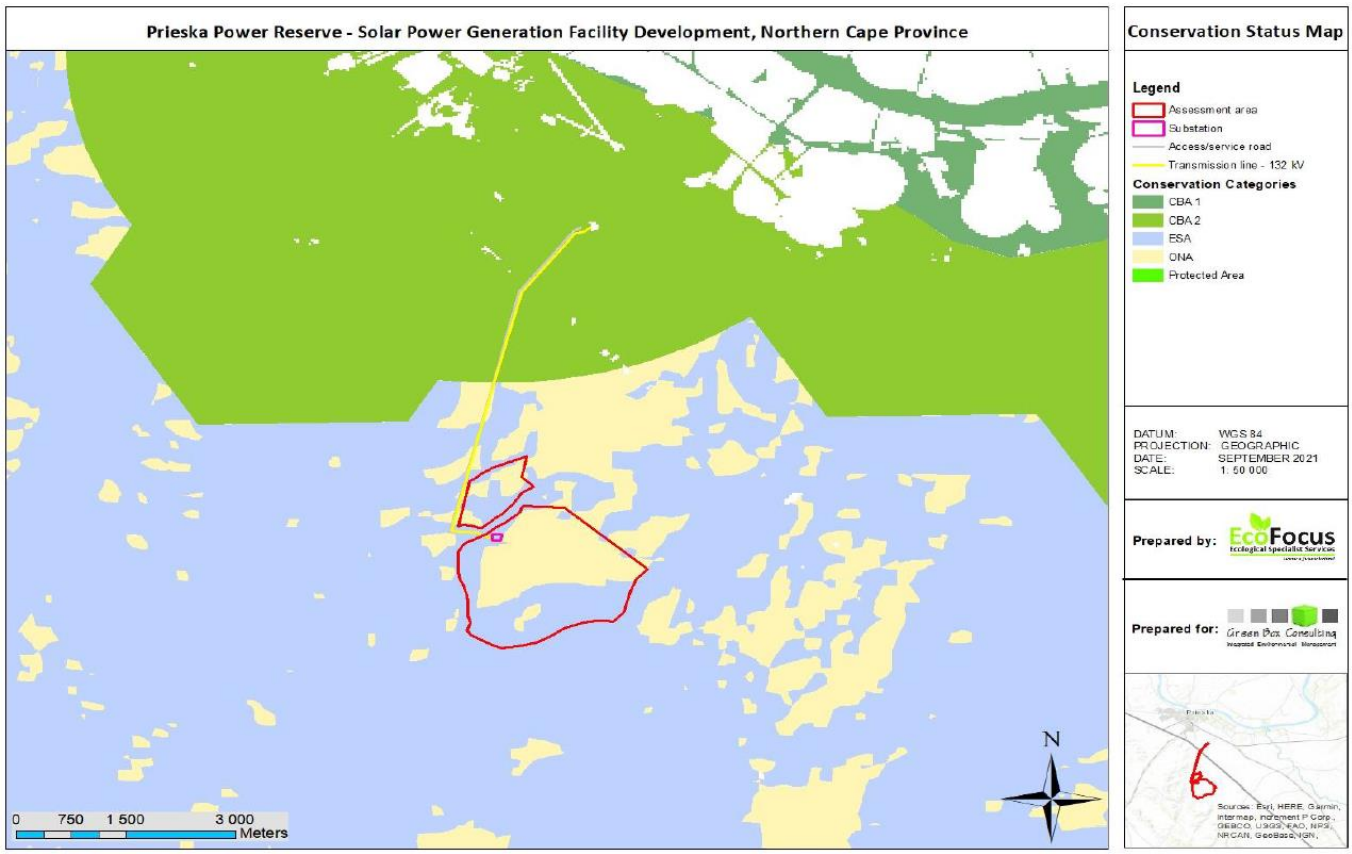

Figure 18: Conservation status map illustrating the conservation categories associated with the assessment area as well as the 132 kV electrical transmission line and access/service road

4.2.8 Water Catchment- and Drainage

The assessment area falls within the D72A quaternary surface water catchment- and drainage area. Three significant second-, third- and fourth-order ephemeral watercourses flow past the assessment area directly adjacent north and south as well as in-between the separate northern and southern footprint areas, respectively. These three watercourses are responsible for a significant portion of the localized catchment and drainage, associated with surface water runoff from the mountain range to the south and west of the assessment area. They all flow in a north-easterly direction and further join a number of other significant watercourses, which eventually all discharge into the Orange River, situated approximately 7.5 km north of the assessment area. The watercourses therefore form an important part of the local and broader quaternary surface water catchment- and drainage area towards the north.

Due to the lack of continuous water flow through the assessment area, these watercourses do not possess any distinct riparian zones or significant variations in vegetation species composition or -structure, relative to the surrounding terrestrial landscape. Merely slight to moderate increases in density of woody shrub individuals are evident within- and along the edges of the watercourses.

A number of small yet still significant preferential water flow paths/drainage lines also traverse the assessment area. These flow paths/drainage lines assist with channeling and discharging surface water runoff through the assessment area, into the three significant watercourses or the subsequent other significant watercourses. From a hydrological perspective, these flow paths/drainage lines therefore play an assisting role in the localized catchment and drainage, associated with surface water runoff from the mountain range.

Due to the lack of continuous water flow through the assessment area, these flow paths/drainage lines do not possess any distinct riparian zones or significant variations in vegetation species composition or -structure,

relative to the surrounding terrestrial landscape. Merely slight increases in density of woody shrub individuals are evident within- and along the edges of the flow paths/drainage lines.

The proposed transmission line and access/service road will traverse some significant watercourses as well as preferential water flow paths/drainage lines at approximately 19 locations, along the proposed new route. It is not anticipated that the proposed development at these watercourse- and flow path/drainage line crossings, should significantly impede or impact on the flow regimes of the relevant watercourses and/or flow paths/drainage lines.

4.2.9 Avifauna

The vegetation in the footprint and environs of the proposed development consists of grassland (which is clearly in the minority) and Senegalia mellifera (formerly Acacia mellifera) dominated woodland, particularly along drainage lines, set in a Rhigozum trichotomum dominated scrubland matrix. Mountainous terrain occurs in close proximity to the south and west of the proposed development footprint. The footprint of the solar field of the proposed PV Phase 1 development is currently utilised, or have the potential of being utilised, by a wide range of bird species. Most of them are of no particular conservation concern. Based on the information currently available, it is tentatively concluded that the proposed footprint area is not extensively utilised by any of the Red Data species occurring in the area. This will however be confirmed in the EIA phase.

The following red data bird species may utilise habitat on and around the site:

Table 5: Bird species that may frequent the proposed development site

Common name	Species name	Status
Blue Crane	*Anthropoides paradiseus*	Endangered
Tawny Eagle	*Aquila rapax*	Vulnerable
Kori Bustard	*Ardeotis kori*	Vulnerable
Black Stork	*Ciconia nigra*	Vulnerable
Cape Vulture	*Gyps coprotheres*	Endangered
Ludwig's Bustard	*Neotis ludwigii*	Vulnerable
Verreauxs' Eagle	*Aquila verreauxii*	Least concerned

4.3 Heritage

The area proposed for the development of the Prieska Power Reserve PV Plant is located in an undeveloped rural area south of the town of Prieska.

Oldest bedrock sediments in the study area are represented by Late Archaean / Early Proterozoic, Transvaal Supergroup carbonate rocks (c. 2.6 Ga), made up of banded iron formations (BIF) containing haematite, crocidolite and chert layers (Vk) located in the basinal facies of the Ghaap Group (Figure 18). Localized outcrops of Early Permian Dwyka sediments (C-pd cf. Mbizane Formation, Karoo Supergroup, c. 320-290 Ma) represent valley and inlet fill deposits left behind on the Transvaal basement rocks by retreating glaciers about 300 million years ago (Visser et al. 1990; Johnson et al. 2006). The basement rocks are capped by localized surface calcretes as well as variable clasts of surface gravels and scree. Quaternary wind-blown sand (Qg) and alluvial overbank sediments occur along ephemeral water courses and low-lying areas.

Historical Features

A historically significant pump house is located 11 m from the proposed pipeline where it terminates at the Orange River. The structure is given a site rating of Local Significance Grade 3A. Two bullet casings for a calibre

.303 and .577/450 (Martini Henry breech-loading single-shot rifle) were recorded and mapped in Bottomland Solar footprint 0B.

Graves

The water pipeline partially goes through a graveyard area located between the Golf Course and van Niekerk Street in Prieska. The graves are rated as Locally Significant (Grade 3A)

Stone Age artifacts

The Stone Age archaeological footprint is primarily represented by uncapped Stone Age archaeological assemblages archaeological assemblages and isolated finds (locally derived surface scatters) occurring at the Battery Site, the water lines, service road and electrical line sections between the R357 and N10 provincial and national roads, as well as Bottomland Solar footprint 0B. These finds are rated as Generally Protected A.

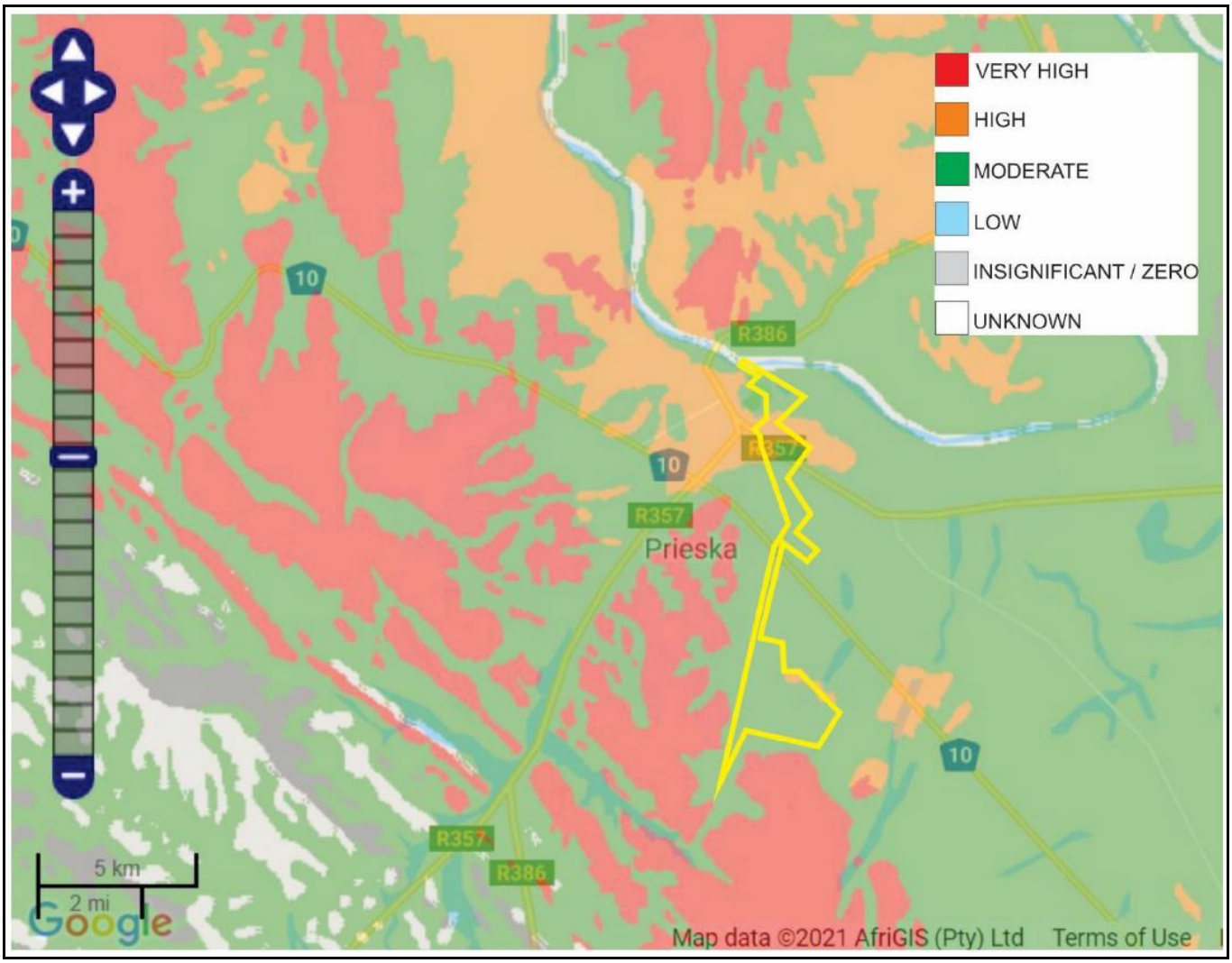

Figure 19: Study area (yellow polygon) marked on SAHRIS palaentosensitivity map (2021)

4.4 Preliminary Site Environmental Sensitivity Screening

The assessment area for the proposed Photovoltaic (PV) solar power generation facility, consists of two directly adjacently located footprint areas of approximately 332 ha (south) and 52.3 ha (north) in size, respectively. This equates to a total area of approximately 384.3 ha in combined size. The main physical footprint areas to be

cleared constitute those of the PV grid-, internal access/services road- and substation footprints, which equate to a total area of approximately 145.76 ha in combined size.

A narrow linear physical footprint section of approximately 7 m in width, will be cleared of vegetation underneath and all along the proposed 132 kV electrical transmission line, for the proposed access/service road. It will also be maintained as such, over time. The rest of the transmission line servitude will not be holistically cleared of vegetation. Only the pylon locations will be cleared, while woody tree or shrub individuals of ≥ 2.5 m in height will be cut or removed, if found to be present throughout the servitude. It will also be maintained as such, over time.

The assessment area falls within the D72A quaternary surface water catchment- and drainage area. Three significant second-, third- and fourth-order ephemeral watercourses flow past the assessment area directly adjacent north and south as well as in-between the separate northern and southern footprint areas, respectively. These three watercourses are responsible for a significant portion of the localised catchment and drainage, associated with surface water runoff from the mountain range to the south and west of the assessment area. They all flow in a north-easterly direction and further join a number of other significant watercourses, which eventually all discharge into the Orange River, situated approximately 7.5 km north of the assessment area. The watercourses therefore form an important part of the local and broader quaternary surface water catchment- and drainage area towards the north.

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The proposed transmission line and access/service road will traverse some significant watercourses as well as preferential water flow paths/drainage lines at approximately 19 locations, along the proposed new route. It is not anticipated that the proposed development at these watercourse- and flow path/drainage line crossings, should significantly impede or impact on the flow regimes of the relevant watercourses and/or flow paths/drainage lines.

According to SANBI (2006-2019), the entire assessment area as well as the associated substation, transmission line and access/service road all fall within the Bushmanland Arid Grassland vegetation type (NKb 3). This vegetation type mainly consists of extensive to irregular plains on a slightly sloping plateau sparsely vegetated by grassland and mostly dominated by white grasses such as Stipagrostis species. The vegetation type has the characteristics of semi desert (SANBI, 2006-2019). This vegetation type is classified as Least Concerned (SANBI, 2006-2019).

The entire assessment area as well as the southern half of the associated transmission line and access/service road form part of a broad mosaic of Ecological Support Area (ESA) and Other Natural Area (ONA), in accordance

with the Northern Cape Provincial Spatial Biodiversity Plan 2016 (NCPSBP), which sets out biodiversity priority areas in the province. The northern half of the associated transmission line and access/service road however falls within a Critical Biodiversity Area two (CBA 2), in accordance with the NCPSBP.

A number of small slightly elevated calcrete ridges/outcrops are present along the north-eastern boundary of the larger southern footprint of the assessment area. No significant variations in vegetation species composition or -structure, relative to the surrounding karroid shrubland- and karroid shrubby grassland landscapes of the assessment area, are evident throughout these ridges/outcrops. It is evident that these ridges/outcrops are extensively utilised by various burrowing mammal species as refuge and for breeding/persistence purposes. This is likely as a result of the lower soil surface rockiness and subsequent higher penetrability of soils, which allows for easier burrowing. The ridges/outcrops therefore possess locally distinct and important mammalian habitat attributes/features and are viewed as being of localised conservational significance.

The karroid shrubland- and karroid shrubby grassland landscapes of the entire assessment area, are extensively covered by individuals of the nationally protected tree species Boscia albitrunca. The average density of this species throughout the assessment area, was calculated to be approximately 17 individuals/ha. This equates to a minimum estimate of approximately 6 533 individuals, which are projected to be present throughout the assessment area. Virtually all of these individuals however constitute low-growing, coppicing shrubs (≤ 1.5 m in height), while merely 8 individuals of ≥ 2m in height were found to be present throughout the entire assessment area.

A preliminary site environmental sensitivity map has been developed and highlights the identified site sensitive receptors, see Figure 20.

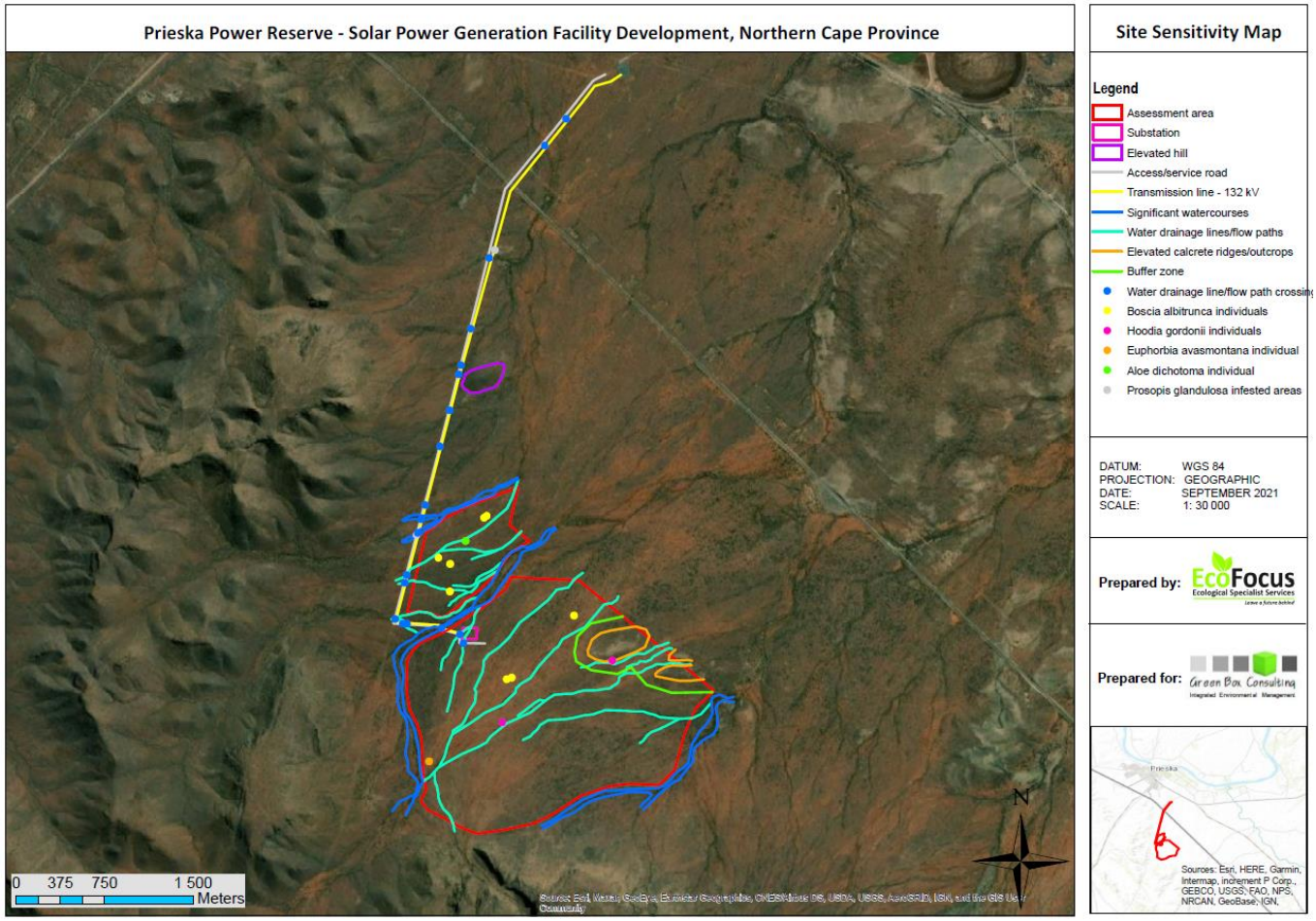

Figure 20: Site sensitivity map illustrating all the important/significant ecological features

4.5 Socio-Economic Environment

4.5.1 Demographic baseline

Between 2011 and 2016 the population of SLM grew at an average annual growth rate of 1-.1% from 21, 591 to 23,075 people in 2016. The growth rate of the municipal population was below the national population growth of 1.5% per annum during the same period, potentially implying some out-migration from the area during the period. The relative low female percentages and the high percentage of people in the working population in SLM suggests historic high in-migration rates (prior to 2011) and single male migrants having settled in the area. This could be due to the former activities at the copper-zinc mine at Copperton which opened in 1972 and was shut down in 1991 by the Anglovaal Mining Group. At its heyday the mining town hosted around 3000 workers and their families (SLM, 2019).

Since 2016, there could have been in-migration into the area due to a number of renewable energy projects implemented in the area and a large-scale mining project in planning phase (see Section 7.5. Economic Profile below). A new residential area consisting of 3,500 residential erven is planned for Prieska town as part of the planning for new mining activities in the area (Orion Minerals, 2020).

SLM consists of 5 wards. The majority of the population stays in and around Prieska town (wards 1,2 and 3):

- Ward 1 covers the northern portions of Prieska town (e'Thembeni and Parts of West-End).
- Ward 2 covers the southern section of Prieska town (Bonteheuwel and Parts of West-End).
- Ward 3 includes the rural areas to the east and northeast of Prieska town (including Niekershoop approximately 40km northeast of Prieska town).

- Ward 4 to the south of the town includes Copperton some 50km southwest from Prieska town and Marydale some 80km northwest from Prieska town.
- Ward 5 includes the immediate areas surrounding Prieska town including the industrial area to the south of the town (Ext 15, Smarty Town, Krygkor, the Bult and Town areas in Prieska).

Table 6: Population Size and Density, 2016

Area	Population	Population density (persons/km^2)	% Coloured population	% Females	Working population (18-64 years)
Siyathemba Local Municipality	23 075	1,6	74%	48,8%	62%
Ward 1 (Prieska town)	21,7%	2 991,2	-	-	-
Ward 2 (Prieska town)	30,1%	6 695,4	-	-	-
Ward 3 (Niekerkshoop)	14,1%	1,1	-	-	-
Ward 4 (Copperton & Marydale)	15,1%	0,4	-	-	-
Ward 5 (surrounding Prieska town)	19,1%	4,4	-	-	-
Pixley ka Seme	126 333	1,9	63%	50,1%	59%
Northern Cape	1 193 780	3,2	43%	50,0%	58%
South Africa	55 653 654	45,3	9%	51,0%	57%

Source: Based on Stats SA, 2016 (Community Survey) and Stats SA, 2011 (Census)

The number of households in SLM increased from in 2011 to 6 616 households in 2016 with an annual growth rate of 2,4%, much higher than the population growth of 1,1% per annum during the same period. This suggests the splitting off of households to form smaller family units. This, in turn, places pressure on local municipalities to provide basic households service in their areas.

Table 7: Households Characteristics, 2016

Area	Number of households	Average household sizes	% Female headed Households
Siyathemba Local Municipality	6 616	3,5	35.6%
Pixley ka Seme	50 732	2,5	36.8%
Northern Cape	353 710	3,4	38.9%
South Africa	16 923 309	3,3	41.3%

Source: Based on Stats SA, 2016 (Community Survey) and Stats SA, 2011 (Census)

4.5.1.1 Land-use patterns

The land use patterns in the area are indicated in Figure 21 below.

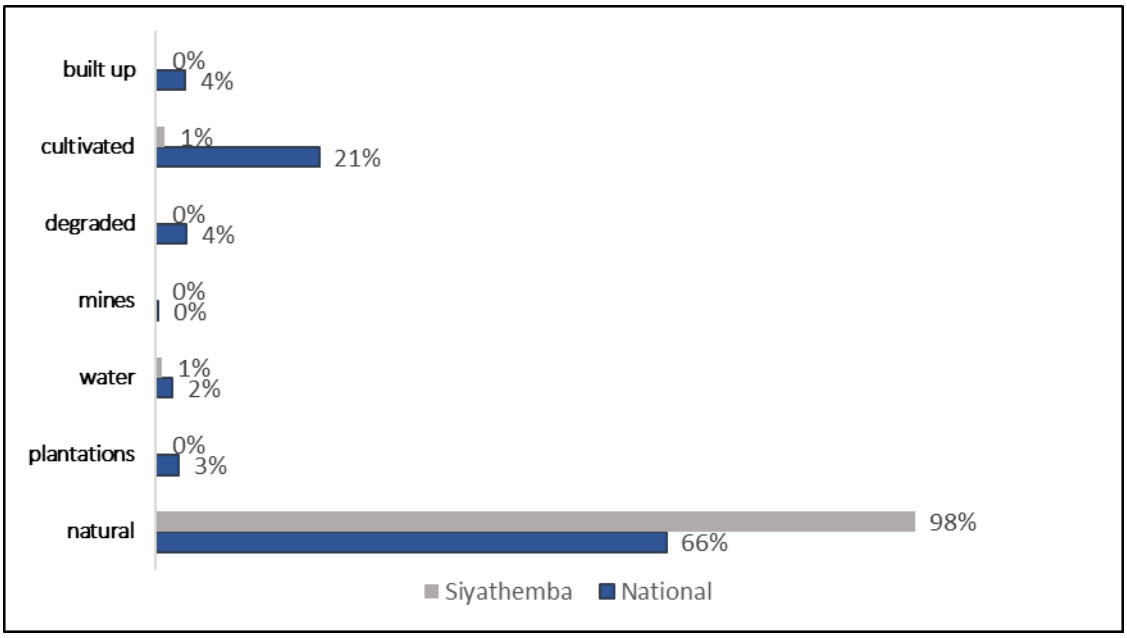

Figure 21: Distribution of Municipal Land, Source: Municipal Demarcation Board, 2018

The table shows the relative high contribution of natural /grazing areas as percentage of municipal land compared to the national average. Cultivated land (producing oilseed, grains, grapes) is mainly prevalent along the irrigated lands along the banks of the Orange River that runs through the municipal area.

4.5.1.2 Institutional profile

Basic household services delivery and infrastructure

Table 8 below shows that households in the Northern Cape, Pixley ka Seme and SLM fared slightly better than national households in terms of basic service delivery. In SLM, 9% of households live in informal houses or shacks compared to 13% of provincial and national households; 59% did not have access to piped water inside their houses – compared to 70% nationally and 19% of households did not have access to a flush toilet in house compared to 26% nationally. The municipality also fared better than the provincial and national averages in terms of waste collection and access to electricity (Community Survey 2016).

Table 8: Basic Household Services, 2011 (wards) and 2016

Area	% of households				
	living in informal houses/shacks	With no access to piped water in house	Without flush toilet	Without regular refuse removal	Without access to electricity
Siyathemba Local Municipality	8.5%	59%	19%	12%	5%
Pixley ka Seme	9.9%	54%	17%	22%	6%
Northern Cape	12.8%	55%	20%	35%	7%
South Africa	13,0%	70%	26%	43%	7%

Source: Stats SA, 2016 (Community Survey) and Stats SA, 2011 (Census)

Water supply infrastructure: SLM is considered to have abundant water supply from the Orange River, with the Gariep and the Vanderkloof Dams on the upstream side of the river. Siyathemba Municipality is the Water

Services Authority (WSA) and Water Services Provider (WSP) for Prieska, Niekerkshoop and Marydale. The Municipality is also supplying bulk water to Copperton, but Alkantpan (Armscore) is responsible for the delivery of water, sanitation, and electricity services. No services are currently being rendered on farms. Prieska is abstracting water from the Orange River whilst Marydale and Niekerkshoop are dependent on groundwater (boreholes). Copperton receives its water from the Orange River via Prieska. There are no water treatment works facilities in Marydale and Niekerkshoop. It is envisaged that the bulk water supply to Marydale and Niekerkshoop could become a problem within the next 15 to 18 years. The municipality are furthermore experiencing challenges in terms of maintenance of infrastructure on an ad-hoc basis as well as water quality management (SLM, 2019).

Waste Treatment/Sanitation infrastructure: Services are rendered in Prieska, Niekerkshoop and Marydale. No services are rendered to Copperton, since Alkantpan (Amscor) is responsible for the delivery of water, sanitation, and electricity services. No services are currently being rendered on farms. The Waste Water Treatment (WWT) works in the Niekershoop and Marydale mainly consists of oxidation ponds. WWT in Prieska consists of an internal sanitation system with waterborne sanitation network and onsite sanitation facilities. Furthermore, there are some septic tanks in areas not serviced with the sewer network. In 2019, the following challenges were highlighted related to wastewater treatment facilities in the area, namely the lack of a wastewater treatment works in Marydale, high service delivery backlogs, collapsing VIP toilets, and lack of maintenance on infrastructure (SLM, 2019). In 2021 the municipality spent some R34m to upgrade WWT works in the municipal area (Magoum, 2021).

Waste management infrastructure: There are currently no formal Municipal driven waste minimisation activities taking place in the Siyathemba Municipality. The landfill site in Prieska is authorised and has enough airspace for the next 20 years. The Niekerkshoop and Marydale disposal sites are however not authorized. Waste disposal sites are not well managed due to financial, personnel constraints as well as an ageing vehicle fleet. Wind-blown litter is a serious problem at the site. The Municipality is also experiencing dumping of waste in areas not demarcated for waste disposal (SLM, 2019).

Electricity infrastructure: Two areas in Prieska still need to be upgraded because the electricity network is old and power failures occur. The biggest part of Prieska, as well as the whole of Marydale and Niekerkshoop, is being supplied by ESKOM directly to customers. The municipality needs to update is Energy Master plan for the Municipality that was last developed during 1998 (SLM, 2019).

Health status and facilities

The population with access to medical aid funds are slightly higher in SLM (14%) than nationally (13%) albeit still at a very low level (Municipal Demarcation Board, 2018)

In 2010, the HIV/AIDS prevalence rate of the Siyathemba population was 6.0% compared to the district rate of 6.5%. These rates compared well to the Northern Cape (7.6%) and South African (12.6%) averages in the same year (SLM, 2019). Prieska town is also known for its legal battles of workers who demanded compensation for asbestosis after working in the Koegas mine. Many residents allegedly suffered from asbestosis and other asbestos-related disease through direct exposure through working at the mine or secondarily from asbestos-containing materials in the town (Blignaut et.al, 2009).

There are five public health care facilities in SLM including PHC clinics in Niekerkshoop (one), Prieska (two), Marydale (one) as well as the Bill Prickard district hospital in Prieska. All facilities are serviced with water and sanitation services. The support services to these health facilities such as roads, electricity, water and sanitation are also sufficient. The municipality recorded a ratio of 17 clinics per 100 000 persons in 2016 compared to the national ratio of 12. In the same vein, the ratio of hospitals to population was also much higher in SLM (4) than nationally (Municipal Demarcation Board, 2018).

In terms of health shortages, SLM reported challenges in the areas of ambulances (Niekerkshoop), and Medical Practitioner shortages (SLM, 2019)

Education status and facilities

The table below shows that a higher percentage of the labour force were unskilled with no schooling or some schooling (73%) than in the district (70%), province (66%) or nationally (56%). Only 23% of the SLM labour force were medium skilled (completed matric) compared to 36% nationally and only 4% could be considered highly skilled compared to 8% nationally.

Table 9: Adult (19 years' plus) education levels 2016 (municipal and provincial level)

Area	No schooling	Some schooling but less than matric	Completed Matric	Tertiary
Siyathemba Local Municipality	7,3%	65,9%	23,1%	3,7%
Pixley ka Seme	12,2%	58,2%	25,9%	3,8%
Northern Cape	8,1%	57,4%	29,9%	4,6%
South Africa	7,3%	48,8%	36,3%	7,7%

Source: Stats SA, 2016 (Community Survey) and Stats SA, 2011 (Census)

SLM had a ratio of 3,9 primary schools per 10 000 of the population compared to 3,8 nationally and only 1,7 secondary schools per 10 000 people compared to 3,9 nationally. On average there were about 565 pupils per educational institution compared to 463 nationally, suggesting some shortage in the number of primary and secondary educational institutions in the area. The number of learners per educator was also slightly higher in SLM at 25,3 compared to the national average of 24,9 leaners per educator (Municipal Demarcation Board, 2018). However according to the Integrated Development Plan (IDP), the Municipality does not experience much challenges with regards to the availability of schools. The support services such as roads, electricity, water and sanitation are also sufficient (SLM,2019). Of the 10 schools in the area, 6 are located in Prieska town; two are farm schools, one is located in Marydale and one in Niekershoop.

The DRU-A Professional Further Education and Training College (DRU-A-FET) is the only tertiary education institution in SLM. It is a private institution that was established in 2008 with a main campus in Kimberley and branches in Warrenton and Prieska. The college presents courses in education, local government and business. The only other tertiary education institution in the area was the Vaal University of Technology (VUT) Upington Campus that closed on June 2021. VUT was a sole public provider of higher education within a 400km including Upington and neighbouring towns such as Keimoes, Kakamas, Kenhardt, Olifantshoek, Groblershoop and Prieska, as well as other regions such as Namakwaland, Pixley ka Seme (De Aar-Prieska area), JTG (Kuruman area). The college provided courses in the agricultural field including a National Diploma in Agricultural Management Tourism Management, Internal Auditing, Marketing Management, Retail Business Management, Human Resources Management and Cost & Management Accounting (Vaal University of Technology, 2021).

The Siyathemba Municipality have appointed a service provider to pursue and implement its Siyathemba Integrated Education and Skills Development Initiative (SIESDi) (SLM, 2019).

4.5.1.3 Transport infrastructure

The 1,7km long airfield in Prieska is suitable for airplanes to land and take off of light aircrafts. There are 2 gravelled runways that are gravelled regularly. This airfield is registered with the Civil Aviation Authority and is inspected by them every year after which a license is issued to the Municipality.

The operating rail siding of Groveput on-route to the town of Prieska, provides rail access to the main Kimberley – De Aar railway line and from there the ports. (SLM, 2019).

SLM have a total road length of 584 km of which 63% are secondary gravel roads; 32% is the national tarred road (the N10) and 4% is secondary tarred roads. On a national level only 17% of South Africa roads are secondary gravel roads (Municipal Demarcation Board, 2018).

4.5.1.4 Telecommunications

There are 3 365 landlines per 100 000 people in SLM compared to 3 000 people nationally. Mobile phones are less prevalent with 19 792 mobile phones per 100 000 people compared to 22 518 nationally. Access to the internet is more limited in SLM than nationally with only 6,1% people having access to the internet in SLM compared to 7,4% nationally (Municipal Demarcation Board, 2018).

4.5.1.5 Community safety

There is a Police Station in each of the 3 towns (Prieska, Marydale and Niekershoop). There is no fire brigade in the municipal area. The Municipality does not have a Disaster Management Plan, but a Community Safety Plan is under development (SLM, 2019).

Table 8 below shows the relatively low per capita crime rate per capita in SLM compared to the provincial and national averages with 34 crimes reported for every 1,000 persons living in the municipality in 2019.

Table 10: Per capita crime rates (cases reported per 1000 persons)

Area	2019
Siyathemba Local Municipality	34
Northern Cape	74
South Africa	36

Source: Crime Stats SA, 2020

The violent crime and property crime ratios for the municipality is both substantially below the national average with 1 231 violent crimes reported per 100 000 people in the municipal area compared to 1 946 nationally and 1 391 property related crimes reported in 2018 compared to 5 326 nationally.

SLM has also experienced a number of violent community protest actions that were prevalent across the country for the past two decades. These protests are mainly driven by municipal service delivery issues as well as high levels of local unemployment. Two recent protests that stand out in SLM include:

- In May 2021 there were public protests from community members related to a perceived lack of local procurement opportunities at the resumption of copper mining activities by the Australian mining company Orion in Copperton, just outside Prieska. These protests allegedly sparked intimidation and threats from armed community members which resulted in the mine obtaining an interdict against the protestors. The mining council and the mine considers the protest actions to be part of the former construction 'mafia' tactic that appears to have jumped the fence to mining, renewable energy and other sectors which are targeted by so-called local 'business forums' eager to negotiate their way into the procurement budgets by intimidating investors with community destabilisation. The source of this disturbance is the Preferential Procurement Policy Framework Act which allows 30% of all contract value above R30 million on state construction contracts to be allocated to certain designated groups, including black-owned small and medium-sized enterprises. The regulations do not apply to private sector construction contracts, but this has not deterred some local forums who sow confusion over the preferential procurement policy (Seccombe, 2021)
- In 2016 there was another violent community protests when residents marched to the municipal chambers protesting over the newly elected ANC mayor while blocking roads and setting tyres alight (ENCA, 2016).

4.5.1.6 Local development priorities

The national objectives over the medium term according to the 2020-2025 Medium Term Strategic Framework (MTSF) are (DEDAT, 2021)

- Building a capable development state
- Economic transformation and job creation
- Education skills and health
- Reliable and quality basic services
- Spatial integration and human settlements
- Social cohesion and safe communities
- Regional contribution towards better Africa and world

The development vision of the Northern Cape is to create a radically transformed economy in the Northern Cape and its mission to accelerate economic growth and development of the Northern Cape Province through diversification, empowerment, employment, business creation and sustainable development (DEDAT, 2021). To pursue these objectives, the Northern Cape's Department of Economic Development and Tourism (DEDAT) focuses its core activities on small business development; trade and sector development; business support, tourism development and research and innovation.

Core provincial development objectives that were identified for 2020 to 2025 include (DEDAT, 2021):

- Human capital development of youth
- Strengthening international trade
- Support diversification of economies, tourism and the knowledge economy, entertainment industry and energy-related enterprises
- Focus on green economy solutions

The larger development objectives of the Pixley ka seme District IDP include (Pixley ka Seme, 2020):

- Promote growth that is shared within the community
- Enhance integrated development planning in municipal operations
- Sound and financially stable local government that provide essential services, disaster management, health services and spatial development planning

The Siyathemba Local Municipality completed their last Local Economic Development Strategy (LED) in 2012 and have not yet developed an updated strategy. The basic tenets of the 2012 strategy were the provision of access to all basic services and the promotion of the equitable creation and distribution of wealth in the local area. To this end the LED strategy focussed on four anchor projects (SLM, 2012):

- **The Bos Development:** This entails the turn-around and rejuvenation of the "Die Bos" Holiday Resort in Prieska, not only as local, but also as a provincial growth strategy. The focus of this initiative includes the development of four municipal properties namely [1] Die Bos Holiday Resort situated on the bank of the Orange River, [2] Prieska Golf Course, [3] Die Koppie Nature Garden, and the [4] Municipal Settling Ponds.
- **Solar Energy Project:** SLM signed an MOU with the Department of Energy for a 5 000ha of Commonage Land in Prieska and Marydale to develop a Prieska Solar Park to initially generate 1 GW of Solar Energy into the Eskom Grid with the possible expansion, if the space permits, utilising variety of technologies.
- **Aqua – Commercial Fish Farming Project by the Department of Trade and Industry (DTI):** The DTI and Pixley Ka Seme DM intend to put up Fish Dams for Fish Farming purposes on the Orange River. Aqua Eco have subsequently developed a feasibility study for the DTi on behalf of the Pixley Ka Seme DM and their findings suggest Prieska should be the site for the pilot project. This study included all the municipalities on the banks of the Orange River. The Siyathemba Municipality was identified as ideal for the pilot project provided.
- **Square Kilometre Array (SKA) Strategic position outside the Demarcated Area:** The technology types to be set up by the SKA project is highly sensitive and will not allow any major economic and signal developments

within a certain core field hence the opportunity for secondary industries to be develop on the outskirts of their footprint actions, including the peripheral areas of Siyathemba, Emthanjeni and Khara Hais local municipal areas.

In the 2019/20 LED review in the Siyathemba IDP challenges related to the LED strategy includes the lack of an updated strategy since 2012 as well as the lack of an implementation plan for the LED strategy (SLM, 2020).

4.5.1.7 Local government capacity

The high vacancy rates of senior management at SLM as indicated in Table 11 are noticeable. The high municipal personnel per capita ratio couples with high vacancy rates also could suggest some over-staffing in terms of middle management and junior positions.

The financial management of the municipality furthermore experiences challenges as is evident from the qualified audit that the municipality received in the 2018/19 financial year. This audit result indicated that the Auditor-General did not have all of the underlying documentation needed to determine an opinion.

As indicated in the table below, financial challenges that the municipality face that are even more severe than on a national level include the following:

- The low debt collection rates
- The cash flow of the municipality is under pressure, and this is largely due to the low payment culture
- The under-spending of the capital budget suggests under-delivery of basic services.
- Over-spending on the operational budget
- No financial provision is made for the maintenance of municipal assets which, coupled with the current low public investment levels, could have dire implications for municipal service delivery in future.

Other local municipal governance challenges that are highlighted by the municipal IDP (SLM, 2019) include:

- The Municipality does not have an Integrated Human Resource Strategy in place to address all issues with regards to people already on the organogram of the Municipality as well as to retain employees and attract skilled people
- Although the Municipality does have a skills development plan in place, the improvement of skills within the Municipality remains a challenge
- Audit opinions tracked over time indicate that the Municipality is NOT improving its Audit
- New developments in the municipal area place pressure on the municipality in terms of technical capabilities spatial development planning; roads, works and storm water master planning; water and sanitation planning; the planning of electricity and energy infrastructure and Distribution; the development of technology hub including cyber security planning
- Contract management of IPPs including the lease regulations.

Table 11: Local Government Capacity

Governance issue	Siyathemba Local Municipality	South Africa
Municipal election results (2016):		
African National Congress	60%	60%
Democratic Alliance	31%	26%
Economic Freedom Fighters	3%	9%
Municipal Audit Result (2018/19)	Qualified	Unqualified with findings
Money Generated Locally % of Revenue (2018)	60%	-
Current Debtors Collection Rate (%) (70%-80%) (2018)	0,2%	64%
Fruitless And Wasteful Expenditure (Norm=0) (2018)	63%	13%

Spending Of Capital Budget (% Over Or –Below) (Norm 5% +/-) (2018)	-94%	-29%
Spending Operational Budget (% Over + Or –Below) (Norm 5% +/1) (2018)	+35% (2016)	+9%
Cash Coverage (Months of Operating Expenses that can be covered with cash available) (Ideally 3 Months) (2018)	2,9 months	1.6 months average
Spending on Maintenance and Repairs % of Capital Equipment (2018)	0,0%	0.1% (8% norm)
Municipal Staff per 100 000 population (2018)	745	405
% of vacancies at municipality (2018)	20%	14%
% Senior Management Vacancies	33%	
% Vacancy of Environmental Management Positions	0% (no positions)	
% Vacancy of Technical Positions	10%	
% Vacancy of Finance Manager Positions	4%	

Source: National Treasury, 2021 and Municipalities of South Africa, 2021

4.6 Economic Profile

4.6.1 Economic activities

The SLM economy provided 5,600 formal job opportunities in 2017 and produced a GVA of R970million (current prices). Table 12 shows the sector distribution of economic activities in SLM compared to the national economy. The economic structure of SLM shows the following characteristics:

- **The agricultural sector** plays a major role in the local economy made the second highest contribution after the services (government and personal) sector. Most of the region surrounding Prieska and Niekerkshoop are regarded as low potential arable land. This indicates that the area is not suitable for the cultivation of crops, but is appropriate for cattle, sheep and goat farming. Game farming also takes place in the area and aids in the development of tourism and hunting activities. The Orange River runs through the Municipality and provides ideal conditions for irrigation farming in Siyathemba, especially the cultivation of grains and vegetables.
- **Mining** historically played a large role in the local economy due to the copper-zinc mine at Copperton, which had been opened in 1972 but was shut down in 1991 by the Anglovaal Mining due to falling copper prices. In its heyday Copperton housed about 3,000 workers and their families; amenities included a school and recreation facilities, including a golf course. Today, most of the buildings have been demolished and only a few houses are used by Armscor, who operate a weapons' testing centre, Alkantpan Test Range. In 2017, the mining sector played a relatively small role in the local economy and was mainly dominated by mining of various semi-precious stones, such as tiger-eye. In 2020, the Australian junior miner conducted a feasibility study to revive the old Anglovaal copper mine in Copperton. Construction activities and operations are planned for 2021 with an anticipated life of mine of 20 years or more. The revived mine will create 900 additional jobs, potentially increasing the contribution of the local mining employment from 400 jobs in 2017 to 1,300 in the next few years.
- **The manufacturing sector** in SLM is relatively small and confined to agro-processing activities including a cotton mill; a bakery; the production of various meat products: manufacture of furniture, built-in cupboards; cattle fodder pellets; and a tiger's eye processing plant.
- While the **utilities sector (energy and water)** still played a minor role in 2017, its role could have increased substantially since then due to several new renewable energy projects (solar and wind) having been allocated through the Renewable Energy Independent Power Producer Programme (REIPPP) including Mulilo Sonnedix solar PV plant (since 2016) (75MW); Copperton wind farm (since 2017) (102 MW) and Garob wind farm (since 2018) (136 MW).

Table 12: Contribution of different economic sectors to the local economy, 2017/19

Sector	Siyathemba Local Municipality		South Africa	
	% employ	% GVA	% employ	% GVA
Agriculture	22,6%	23,5%	6.4%	2.1%
Mining	6,9%	4,1%	3.4%	8.3%
Manufacturing	2,1%	3,5%	10.9%	13.2%
Utilities	0,4%	2,7%	0.8%	3.8%
Construction	5,7%	4,3%	6.0%	3.8%
Trade	12,6%	12,4%	17.5%	15.1%
Transport	1,3%	10,7%	4.6%	9.8%
Finance	8,9%	14,6%	18.3%	19.7%
Services	39,5%	24,1%	32.0%	24.1%
TOTAL	**100%**	**100%**	**100%**	**100%**

Source: Based on Northern Cape Provincial Treasury, 2019 and Stats SA, 2019 (a) (Regional GDP)

The local economy grew at an average annual growth rate of 3% between 2007 and 2017 compared to a district growth rate of 1.4% and a national rate of 1,7% for the same period (Northern Cape Provincial Treasury, 2019).

The tourism sector does not play a large role in the local economy and only contributed to 6% of the total 545 344 bed-nights spent in the Pixley ka Seme District in 2017. The bed-nights spent in the area furthermore declined since 2007. Tourism spending in SLM could have been in the region of 4% of GVA compared to 6% nationally (NC Treasury, 2019). Tourism attractions in the area:

- Die Bos Nature Reserve
- British Fort
- Green Valley Nuts
- The Oranjezicht and the "Keikamspoort Hiking Trails
- Khoisan Rock Art
- Memorial Garden
- Prieska Museum
- Ria Huysamen Aloe Garden
- Schumann Rock Collection
- Wonderdraai Island

4.6.2 Labour force

As indicated in Table 13 below, the Northern Cape unemployment rate lower than the national average in 2016, i.e. close to 27,5% of the labour force (excluding discouraged work-seekers) not in employment. The unemployment rate in SLM was lower than the national and provincial averages in 2016. The unemployment rate stayed relatively constant in SLM since 2011 to 2016 at 24% of the labour force.

Table 13: Composition of the labour force (2016)

• Labour Force Segment	• Siyathemba LM	• Northern Cape	• South Africa
• Formal employment	• 4 861	• 238 079	• 11 491 279
• Informal employment	• 571	• 43 863	• 1 640 901
• Unemployment (narrow)	• 1 728	• 106 723	• 5 594 055
• Total labour force (LF)	• 7 160	• 388 665	• 18 726 235
• Unemployment (narrow (%)	• **24,1%**	• **27,5%**	• **29,9%**

Source: Based on Stats SA Census, 2011 and Stats SA Community Survey, 2016

Informal activities play a smaller role in the labour force (7%) of SLM compared to provincially (11%) or nationally (8% of the labour force). Most of the informal activities are in the trade, service and construction sectors (Northern Cape Provincial Treasury, 2019).

4.6.3 Income levels

As indicated in Table 14 below, there are three official income poverty rates in South Africa namely the food poverty line (FPL) only making provision for basic nutritional needs, the lower-bound poverty line (LPL) also making provision to some extent for other basic needs such as basic clothing, shelter and education. The upper-bound poverty line (UPL) makes full provision for all basic needs including food, clothing, shelter and basic education.

Table 14: National Poverty Lines, South Africa, 2011 and 2017 (nominal terms)

Poverty line	Rand per households per year, 2011	Rand per households per year, 2017
Food poverty line (FPL)	13,220	19,337
Lower-bound poverty line (LPL)	19,771	27,92
Upper-bound poverty line (UPL)	30,742	42,292

Source: Stats SA, 2019 (b) (National Poverty Lines)

Table 15 below shows that the percentage of households that earned below the lower bound poverty line (LBPL) in 2011 (roughly equating R20 000 per year) were slightly lower in SLM than in provincially and nationally - also in line with the unemployment trends discussed above. The larger parts of households in SLM earn less than R75 000 per year while much smaller percentages than nationally earn an income of more than R300 000 per year.

Table 15: Percentage of households per income category, 2011

% Of households earning per annum:	Siyathemba LM	Northern Cape	South Africa
less than R20k per year	39,6%	41,6%	44,5%
R20k - R40k	25,9%	21,3%	19,0%
R40k - R75k	16,4%	14,7%	13,0%
R75k - R150k	8,8%	10,2%	9,2%
R150k - R300k	5,6%	7,1%	7,1%
R300k - R600k	2,8%	3,6%	4,6%
R600k - R1.2M	0,5%	1,0%	1,8%
more than R1.2m	0,4%	0,5%	0,8%
Total	**100,0%**	**100,0%**	**100,0%**

Source: Stats SA, 2011

The percentage of households in SLM that fall below the UPL is even much higher, estimated to be close to close to 60% in 2011 albeit declining to around 45% in 2017 ((Northern Cape Provincial Treasury, 2019).

4.6.4 ECONOMIC DIVERSITY

The economic stability of an economy is influenced by the diversity of production activities as well as the diversity of demand for the products produced by these markets.

The table below shows the production diversity of the SLM with the aid of tress indices. A tress index is a single index that provides an indication of the level of concentration of economic activity in particular economic activities. A tress value closer to 100 shows that an economy is concentrated in a few economic sectors while an index closer to 0 shows that the economy is more evenly distributed across a large number of sectors.

The table shows the medium tress index value of the SLM economy compared to the national economy in 2017. This means that economic activities are currently fairly evenly spread among different economic sectors without one sector dominating the rest. With new investments in the mining and renewable energy sectors after 2017, the economic diversity of the local economy is poised to increase further over the next few years.

Table 16: Diversity Indicators, 2017

Diversity indicators	Siyathemba LM	National
Output (Tress) 2017	43,6	40.8

Source: Northern Cape Provincial Treasury, 2019

4.6.5 NATURAL RESOURCE INTENSITY

The table shows the energy and water efficiency of the national economy. It shows that on average the national economy produces R16,517 worth of GVA for every MWh energy used (including petroleum, gas, electricity, and coal products). In comparison, the SLM only produces R 13,942 of GVA for every MWh energy used. The GMM economy is therefore less energy efficient than the national economy. The main reason for the lower energy efficiency of the SLM economy is the relatively large contribution of the energy inefficient agriculture sector to the SLM economy.

As indicated in the table below, the SLM is however more water efficient than the national economy despite the relative water inefficiency of the agriculture sector. This is due to the relatively large role played by the more water efficient services and trade sectors.

Table 17: Resource Efficiency of the Govan Mbeki Municipality, 2017/2019

• **Area**	• **Energy Efficiency** • **GVA (R)/MWh used**	• **Water efficiency** • **GVA (R) /cubic meter water used**
• Siyathemba Local Municipality	• 13,942	• 440
• National economy	• 16,517	• 207

Source: Department of Energy (2019), Connigarth (2019), Stats SA (2018)

5. SCOPING OF ISSUES ASSOCIATED WITH THE PROPOSED PRIESKA POWER RESERVE PV PLANT

The purpose of this chapter is to present a synthesis of the key issues and potential impacts that have been identified thus far as part of the Scoping Process. These issues and impacts have been identified via the environmental status quo of the receiving environment (environmental, social and heritage features present on site) (discussed in Section 4 of this Scoping Report), a review of environmental impacts from other similar solar projects and input from specialists that form part of the project team. The Terms of Reference for the specialist studies that have been deemed necessary, based on the relevant issues and impacts discussed within this chapter, are incorporated into the Plan of Study for the EIA (discussed in chapter 6).

5.1 Potential Impacts

The potential impacts of the predominant phases of the proposed development (i.e. construction and operation) are identified, described in this chapter. The majority of the environmental impacts are expected to occur during the construction phase for a facility of this nature.

5.1.1 Biodiversity Impacts

The mechanical clearance associated with the proposed solar development, will in all probability completely transform the majority of the existing surface vegetation within the PV grid-, internal access/services road- and substation footprints. The following impacts are anticipated during the construction of access roads, solar panels and associated infrastructure:

- Habitat destruction due to the removal and damage of vegetation through soil stripping.
- Vegetation may be impacted through removal and site disturbances due to the construction activities, leading to shifts in vegetation community and habitat unit structures,
- The movement of heavy machinery will result in soil compaction that will modify habitats, destroy vegetation and inhibit re-vegetation.
- Cabling at a sub-surface level;
- Establishment of transformers and substations;
- Establishment of PV module arrays, possibly on tracking mountings;
- Fencing of the site;
- Establishment of towers for powerlines/transmission lines, and
- Other supportive infrastructure.

The construction phase is a relatively short term undertaking, although “intensive” in terms of the rapid physical changes that arise on site. The operational phase is more benign in nature, with limited staff and minor activity in and around the proposed PV facility. Given this, it is expected that the following impacts of an ecological nature may arise during the construction and operational phases.

Construction Impacts

Terrestrial impacts-

- Ousting of fauna through increased anthropogenic activities and general change in habitat;
- Increased electrical light pollution leading to changes in nocturnal behavioural patterns amongst fauna;
- Exclusion (or entrapment) of in particular, larger fauna on account of the fencing of the site;
- Changes in soils on account of excavation and import of material, leading to alteration of plant communities and fossorial species in and around these points; and
- Removal of protected species in terms of the Northern Cape Conservation Act.

Operation

Terrestrial impacts-

- Alteration of ecological processes on account of the exclusion of certain species inherent to the functional state of land within the PV facility i.e. larger fossorial species and predators will be excluded from the PV facility site by virtue of its fencing, generally leading to possible variations in populations of other species that remain within the site, with concomitant ecological change;
- Increased shading of vegetation as a consequence of the PV arrays, will lead to changes in plant water relations and possible changes in plant community structures within the site; and
- The fencing of the site, possibly with electric fencing, is likely to impact upon faunal behaviour, leading to the exclusion of certain species and possible mortalities. Alternatively, such changes may also favour some specific individuals, particularly those that remain within the confines of the proposed PV facility, which is likely to lead to further localised alteration in habitat and ecological processes within the facility.

5.1.2 Soil/Land Impacts

As noted in the previous chapters, the proposed project is expected to cover an area of approximately 250 ha of the RE of Erf 1, of Prieska Townlands, which is 4251 ha in extent, which is currently being used for livestock grazing. This area will be removed (to a certain extent) from the current land use potential of the farm if the solar project proceeds, although livestock grazing will continue outside the fenced solar facility.

Using the large amount of existing information for soils and agricultural potential in the area (several EIAs have been conducted in in close proximity and adjacent to the development footprint), the following have been identified as potential impacts on agricultural resources and productivity:

Construction & operation Impacts

- Loss of agricultural land use due to direct occupation by the infrastructural footprint of the development for the duration of the project. This will take affected portions of land out of agricultural production.
- Soil erosion by wind or water due to alteration of the land surface characteristics. Alteration of surface characteristics may be caused by construction related land surface disturbance, vegetation removal, and the establishment of hard standing areas, surfaces and roads. Erosion will cause loss and deterioration of soil resources and may occur during all phases of the project.
- Degradation of veld vegetation beyond the direct facility footprint due to constructional disturbance and potential trampling by vehicles.
- Loss of topsoil due to poor topsoil management (burial, erosion, etc.) during construction related soil profile disturbance (levelling, excavations, road surfacing etc.) and resultant decrease in that soil's.

All the above impacts are local in extent and confined to the site. The significance of potential agricultural impacts is influenced by the extremely limited agricultural capability of the site, with no cultivation on it. None of the above impacts are therefore likely to be of high significance. Mitigation measures can also be put in place to reduce the significance of many of these impacts.

5.1.3 Hydrological Impacts

During the construction phase, there are a number of possible sources of water pollution. The following impacts are considered:

Construction Impacts:

- Water may be illegally abstracted from water bodies for construction activities such as dust suppression;
- Servitude clearing would increase surface water runoff;
- Soil erosion from servitude clearing would increase sedimentation in drainage lines and water courses;
- Landscaping may have an indirect impact on the existing drainage lines and dry water courses by causing increased run off, erosion and limited seepage.

- Formation of new drainage lines may also take place due to obstructions to water flow.

Operation during routine maintenance, water may be impacted by the following:

- Herbicide runoff from servitude clearing (including spraying for alien weeds) lead to water quality deterioration;
- Servitude clearing would increase surface water runoff and sedimentation in local water bodies;
- Fuel leaks from maintenance vehicles or spills of materials such as oil during maintenance would result in a deterioration of water quality;
- Waste or maintenance material may be dumped in local water bodies.

5.1.4 Heritage and Archaeological Impacts

Significant impacts to heritage resources are likely to be limited to archaeological resources and may be easily avoided by the final layout. Surface archaeological sites tend to be very easy to record and sample and, as such, mitigation could be very easily affected should this be required. Based on desktop research as well as a field investigation undertaken by the specialist in the scoping phase, many instances of stone age archaeological material were found and recorded. However, the vast majority were of very low significance and do not merit further attention in terms of the siting of the proposed solar energy facilities.

Construction and operational impacts:

- General cutting and filling; and
- Foundation excavations;
- Direct disturbance and/or destruction of archaeological material;
- Direct impacts to the landscape through introduction of industrial type facilities.

5.1.5 Visual Impacts

The activities that will be undertaken as part of the construction and operation phases of the proposed project that will result in potential visual impacts are discussed below. A preliminary analysis of potential visual impacts suggests that the main contributions to the significance of the visual impact for this project will focus on the proposed solar field and on-site substation during the operational phase of the plant.

Construction impacts:

- Change of the visual character of the site and this could affect the sense of place of the region;
- The visibility of ancillary infrastructure (i.e.. Power line, access road, workshop building) on people who live in close proximity to the site;
- A slight increase in traffic can be expected on rural roads, particularly large construction and freight vehicles;
- Light pollution due to operational, safety and security lighting of the facility at night.

Operation

- Potential landscape impact of introducing a large solar plant into a remote rural landscape;
- Potential visual intrusion of a large solar field on the existing views of sensitive visual receptors;
- Potential visual intrusion of tall, relatively large structures on the existing views of sensitive visual receptors; and
- Potential impact of night lighting of the development on the relatively dark rural nightscape.

5.1.6 Regional Economy and Employment

There will be employment and business opportunities for both regional and local residents and businesses during the construction and operational phases. The strategy to be adopted when employing should be in line with and

guided by the objectives and policies of Government. The contractor shall be encouraged to hire local residents and sub-contractors whenever possible.

Based on the status quo conditions of the study area and the nature of the proposed developments, the following social impacts are anticipated:

- Influx of jobseekers;
- Increased competition for urban-based employment;
- Increases in social deviance;
- Increases in incidence of HIV/AIDS infections;
- Decrease in the property value;
- Expectations regarding jobs;
- Local spending;
- Local employment; and
- Job losses at the end of the project life-cycle.

The potential impacts described above are anticipated to mainly be of very low negative significance after mitigation, whilst some high positive impacts may be expected.

5.1.7 Avifauna Impacts

The activities that will be undertaken as part of the construction and operation phases of the proposed project that will result in potential impacts to avifauna species, and thus bird monitoring has been undertaken (pre-scoping) to understand these impacts up front.
Field work to date has made the following findings with respect to avifauna:

- Habitat preferences of bird species with distribution patterns that overlaps with the study area, identified various bird species that could possibly be located within the study area (these will be investigated during the EIR phase);
- A Verreauxs Eagle breeding territory exists off site to the south, approximately 1km from the proposed site.

Construction and operational impacts:

- Destruction of bird habitat;
- Disturbance of birds during construction;
- Fatality of birds at the facility (through collision with infrastructure and electrocution on electrical infrastructure);
- Nesting of birds on infrastructure;
- Altered water runoff on site, and
- Chemical pollution from washing of PV panels.

5.1.8 Traffic Generation Impacts

During all phases (construction, operation and decommissioning) of the project, traffic will be generated. The highest traffic volumes will be created during the construction phase. The activities that will generate traffic during the construction phase include site preparation and the transportation of construction materials and associated infrastructure to the site, as well as the transportation of employees to and from the site on a daily basis.

5.1.9 Cumulative Impacts

The cumulative impacts will be assessed by identifying other solar energy project proposals and other applicable projects, such as construction and upgrade of electricity generation, transmission or distribution facilities in the

local area (i.e. within 30 km of the proposed solar plant) that have been approved (i.e. positive EA has been issued) or the EIA is currently underway.

Cumulative effects associated with these similar types of projects include inter alia:

- Traffic generation;
- Avifaunal collisions and mortalities;
- Habitat destruction and fragmentation;
- Increase in stormwater run-off and erosion;
- Loss of agricultural land;
- Job creation;
- Social upliftment; and
- Upgrade of infrastructure.

The projects that are being undertaken or are proposed to be undertaken within 30 km of the proposed project is detailed in Table 18.

Project name	Distance from Prieska Power Reserve PV Plant Site	Applicant	DFFE Ref. No.	Phase
The Proposed Construction of A 75mw Photovoltaic Power Plant And Its Associated Infrastructure On A Portion Of The Remaining Extent Of Erf 1 Prieska Within The Siyathemba Local Municipality, Northern Cape Province	3.5	Kala-Hari Survey Solutions and Products cc	14/12/16/3/3/2/345	Approved
Proposed Bosjesmansberg solar energy facility site near Copperton, Siyathemba Local Municipality, Northern Cape	28.9	Networx Renewables (Pty) Ltd	14/12/16/3/3/2/579	Approved
The proposed 2MW Mahoebe solar energy facility and associated infrastructure on portion 19 of the farm De Hoek 32, NC	9.3	Mahoebe Eiendomme BPK	14/12/16/3/3/1/1475	Approved
Proposed 75MW IPMS Solar power plant in Prieska, NC	5.1	IPMS Consulting (Pty) Ltd	14/12/16/3/3/1/981	Approved
Proposed Bosjesmansberg solar energy facility site near Copperton, Siyathemba Local Municipality, Northern Cape	28.9	Networx Renewables (Pty) Ltd	14/12/16/3/3/2/579/1	Approved
115 MW Camel Thorn Photovoltaic Solar Energy Facility on the Remaining Extent of Portion 2 of the Farm Karabee 50 east of Prieska within the Siyathemba Local Municipality	6	Camel Thorn Solar Power Plant (RF) (Pty) Ltd	14/12/16/3/3/2/937	Approved

Table 18: EIA Processes currently underway within 30 km of the proposed project

6. Approach to Public Participation

This chapter presents the steps in the Scoping and Public Participation component of the EIA (in accordance with Regulations 41, 42, 43 and 44 of GN R326), and the schedule for the EIA Process.

6.1 Principles for Scoping and Public Participation

The PPP (Public Participation Process) for this Scoping and EIA Process is being driven by a stakeholder engagement process that will include inputs from authorities, I&APs, technical specialists, and the project proponent. Guideline 4 on "Public Participation in support of the EIA Regulations" published by DEAT in May 2006, states that public participation is one of the most important aspects of the EA Process. This stems from the requirement that people have a right to be informed about potential decisions that may affect them and that they must be afforded an opportunity to influence those decisions. Effective public participation also improves the ability of the Competent Authority (CA) to make informed decisions and results in improved decision-making as the view of all parties are considered.

An effective PPP could therefore result in stakeholders working together to produce better decisions than if they had worked independently.

- "Provides an opportunity for I&APs, EAPs and the CA to obtain clear, accurate and understandable information about the environmental impacts of the proposed activity or implications of a decision:
  - Provides I&APs with an opportunity to voice their support, concern and question regarding the project, application or decision;
  - Enables an applicant to incorporate the needs, preferences and values of affected parties into its application;
  - Provides opportunities for clearing up misunderstanding about technical issues, resolving disputes and reconciling conflicting interests;
  - Is an important aspect of securing transparency and accountability in decision-making; and
  - Contributes toward maintaining a health, vibrant democracy."

To the above, one can add the following universally recognised principles for public participation:

- Inclusive consultation that enables all sectors of society to participate in the consultation and assessment processes;
- Provision of accurate and easily accessible information in a language that is clear and sufficiently nontechnical for I&APs to understand, and that is sufficient to enable meaningful participation;
- Active empowerment of grassroots people to understand concepts and information with a view to active and meaningful participation;
- Use of a variety of methods for information dissemination in order to improve accessibility, for example, by way of discussion documents, meetings, workshops, focus group discussions, and the printed and broadcast media;
- Affording I&APs sufficient time to study material, to exchange information, and to make contributions at various stages during the assessment process;
- Provision of opportunities for I&APs to provide their inputs via a range of methods, for example, via briefing sessions, public meetings, written submissions or direct contact with members of the EIA team.
- Public participation is a process and vehicle to provide sufficient and accessible information to I&APs in an objective manner to assist I&APs to identify issues of concern, to identify alternatives, to suggest opportunities to reduce potentially negative or enhance potentially positive impacts, and to verify that issues and/or inputs have been captured and addressed during the assessment process.

At the outset it is important to highlight two key aspects of public participation:

- There are practical and financial limitations to the involvement of all individuals within a PPP. Hence, public participation aims to generate issues that are representative of societal sectors, not each individual. Hence, the PPP will be designed to be inclusive of a broad range of sectors relevant to the proposed project.
- The PPP will aim to raise a diversity of perspectives and will not be designed to force consensus amongst I&APs. Indeed, diversity of opinion rather than consensus building is likely to enrich ultimate decision-making. Therefore, where possible, the PPP will aim to obtain an indication of trade-offs that all stakeholders (i.e. I&APs, technical specialists, the authorities and the development proponent) are willing to accept with regard to the ecological sustainability, social equity and economic growth associated with the project.

6.2 Objective of the Scoping Process

This Scoping Process is being planned and conducted in a manner that is intended to identify and provide sufficient information to enable the authorities to reach a decision regarding the scope of issues to be addressed in this EIA Process, and in particular to convey the range of specialist studies that will be included as part of the Environmental

Impact Reporting Phase of the EIA, as well as the approach to these specialist studies.

As highlighted in Chapter 1 of this Scoping Report, within this context, the objectives of this Scoping Process (as per the 2014 EIA Regulations) are to:

- Identify and inform a broad range of stakeholders about the proposed development;
- Confirm the process to be followed and opportunities for stakeholder engagement;
- Clarify the project scope to be covered;
- Identify and confirm the preferred activity and technology alternative;
- Identify and confirm the preferred site for the preferred activity;
- Clarify the alternatives being considered and ensure due consideration of alternative options regarding the proposed development, including the “No-go” option;
- Conduct an open, participatory and transparent approach and facilitate the inclusion of stakeholder issues in the decision-making process;
- Identify and document the key issues to be addressed in the impact assessment phase (through a process of broad-based consultation with stakeholders) and the approach to be followed in addressing these issues; and
- Confirm the level of assessment to be undertaken during the impact assessment

6.3 Tasks in the scoping phase

This section provides an overview of the tasks being undertaken in the Scoping Phase, with a particular emphasis on providing a clear record of the PPP followed.

PPP for the proposed project will entail that all public participation documents (such as newspaper advertisements, site notices, notification letters etc.) will serve to notify the public and organs of state of the availability of all reports and will provide I&APs with an opportunity to comment on the reports.

Chapter 6 of regulation 326 details the public participation process that must take place as part of an environmental process. The table below provides a quick reference to show how this environmental process has or intends to comply with these legislated requirements relating to public participation.

Table 19: Public participation requirements in terms of S39 of R326

Regulated Requirement	Description
39(1) If the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land.	Proof of landowner consent for the PV facility is attached in Appendix D. The Landowner of the Remainder of Erf 1, Prieska have been automatically registered as interested and affected party and given an opportunity to comment on this scoping report.
40(1) The public participation process to which the—(b) scoping report submitted in terms of regulation 21 and the environmental impact assessment report and EMPr submitted in terms of regulation 23; was subjected to must give all potential or registered interested and affected parties, including the competent authority, a period of at least 30 days to submit comments.	This draft Scoping report is made available to all I&APs and identified stakeholders for 30 days starting from 14 November to 15 December 2021.
(2) The person conducting a public participation process must take into account any relevant guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of an application or proposed application which is subjected to public participation by— (a) fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of— (i) the site where the activity to which the application or proposed application relates is or is to be undertaken; and (ii) any alternative site;	A Notice board was places two positions along the N10 road. Photographic evidence of these notices is attached in Appendix D.
(b) giving written notice, in any of the manners provided for in section 47D of the Act, to— (i) the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken; (ii) owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken; (iii) the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area; (iv) the municipality which has jurisdiction in the area; (v) any organ of state having jurisdiction in respect of any aspect of the activity; and (vi) any other party as required by the competent authority;	The landowner of the RE of Erf 1, Prieska, is Siyathemba Local Municipality. The municipal Manager has welcomed the project to the Prieska area, and confirmed its support. Evidence of this is attached to Appendix D. Owners of adjacent properties have been notified of this environmental process. Such owners have been requested to inform the occupiers of the land of this environmental process. Please refer to Appendix D for copies of these notifications. The ward councillor has been notified of this environmental process. Please refer to Appendix D for copies of these notifications. Please refer to Table 18 below showing the list of organs of state that were notified as part of this environmental process. Please refer to Appendix D for copies of these notifications. DAEARDLR will be given an opportunity to comment on

	this Draft Scoping Report and any other requirements highlighted by them will be complied with.
(c) placing an advertisement in—(i) one local newspaper; or (ii) any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations; (e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to— (i) illiteracy; (ii) disability; or (iii) any other disadvantage.	An advert calling was placed in the Gemsbok newspaper for 17 November 2021. There is currently no official Gazette that has been published specifically for the purpose of providing public notice of applications. Notifications have included provision for alternative engagement in the event of illiteracy, disability or any other disadvantage. In such instances, Green-Box Consulting will engage with such individuals in such a manner as agreed on with the competent authority.
42 A proponent or applicant must ensure the opening and maintenance of a register of interested and affected parties and submit such a register to the competent authority, which register must contain the names, contact details and addresses of— (a) all persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP; (b) all persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and(c) all organs of state which have jurisdiction in respect of the activity to which the application relates.	A register of I&AP has been opened for this application and is presented in table 19 below and Appendix D.
44(1) The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and records of meetings, are attached to the reports and plans that are submitted to the competent authority in terms of these Regulations.	All comments of I&APs will be listed in a comments and response trail report, with responses to these comments. This comments and response trail report will be included in the Final Scoping Report.

6.4 Registration of key stakeholders

A number of key stakeholders were automatically registered and will be given an opportunity to comment on this Draft Scoping Report. Copies and proof of these notifications are included in Appendix D. A list of key stakeholders registered for this process included in the table below.

Table 20: Key Stakeholders automatically registered as part of the environmental process

Stakeholder Register
Neighbouring property owners
Siyathemba: Ward 4 Councillor
South African Heritage Resources Agency
Northern Cape Heritage Resources Authority
Provincial Department of Agriculture
Northern Cape Department of Environmental Affairs, Biodiversity Directorate
Siyathemba Municipality: Municipal Manager
South African National Roads Agency Limited
Department of Transport and Public Works
Department of Health
Department of Minerals and Energy
Eskom
Department of Mineral Resources
Birdlife Africa
Department of Water and Sanitation
The South African Square Kilometre Array
The South African Civil Aviation Authority
SENTECH

6.5 Notification of availability of the Draft Scoping Report

Automatically registered I&APs as well as those who responded to the advert and site notices will be notified of the availability of the |Draft Scoping report for review and comment. A digital copy of the report will be placed on the Green-Box Consulting website and hard copies will also be available at the Prieska Library and at the Municipal Offices. In order to facilitate effective comments, all State Departments and Key stakeholders listed are provided with digital copies of the report through email.

6.6 Comments and response on the Draft Scoping Report

All comments received on this report will be considered, responded to and included in the Final Scoping Report that will be submitted to the authorising authority for decision making.

6.7 Availability of the Drfat Scoping Report

The Draft Scoping Report is made available for a 30-day comment period extending from **14 November 2021 – 15 December 2021.** Copies of the report were available at the following locations:

- Green-Box Consulting Website: www.green-box.co.za
- Prieska local library, and Prieska municipal offices

All key stakeholders, State Departments and Organs of State were provided with a copy of the Scoping report via email.

7. Plan of Study for EIA

This section presents the Plan of Study for the EIA (PSEIA), which sets out the process to be followed in the EIA Phase (as required by the 2017 EIA Regulations). The PSEIA is based on the outcomes of the Scoping Phase (to date) and provides the Terms of Reference (TOR) for the specialist studies that have been identified, the alternatives that will be considered and assessed, as well as the PPP that will be undertaken during the EIA Phase.
This section presents the Plan of Study for the EIA (PSEIA), which sets out the process to be followed in the EIA Phase (as required by the 2017 EIA Regulations). The PSEIA is based on the outcomes of the Scoping Phase (to date) and provides the Terms of Reference (TOR) for the specialist studies that have been identified, the alternatives that will be considered and assessed, as well as the PPP that will be undertaken during the EIA Phase.

7.1 Purpose of EIA and Requirements of the 2017 EIA Regulations

The purpose of the EIA Phase is to:

- Address issues that have been identified through the Scoping Process;
- Assess alternatives to the proposed activity in a comparative manner;
- Assess all identified impacts and determine the significance of each impact; and
- Recommend actions to avoid/mitigate negative impacts and enhance benefits.

The EIA Phase consists of three parallel and overlapping processes:

- Central assessment process through which inputs are integrated and presented in an EIA Report that is submitted for approval to the DFFE and other commenting authorities;
- Undertaking of a PPP whereby findings of the EIA Phase are communicated and discussed with I&APs and responses are documented;
- Undertaking of specialist studies that provide additional information/assessments required to address the issues raised in the Scoping Phase.

Table 21 below shows the requirements for the PSEIA in accordance with Appendix 2 (1) (h) of the 2017 EIA Regulations.

Table 21: Requirements for Plan of Study for EIA in accordance with the 2017 EIA Regulations

Section of the EIA Regulations: Appendix 2 (1)(h)	Requirements for a PSEIA in the Scoping Report in terms of Appendix 2 of the 2017 NEMA EIA Regulations (GN R326)
i	A plan of study for undertaking the EIA process to be undertaken, including - • a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;
ii	• a description of the aspects to be assessed as part of the environmental impact assessment process;
iii	• aspects to be assessed by specialists;
iv	• a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;
v	• a description of the proposed method of assessing duration and significance;
vi	• an indication of the stages at which the competent authority will be consulted;
vii	• particulars of the public participation process that will be conducted during the environmental impact assessment process;

viii	• a description of the tasks that will be undertaken as part of the environmental impact assessment process; and
ix	• identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

7.2 Overview of Approach to Preparing the EIA Report and EMPr

The results of the specialist studies and other relevant project information for the project will be summarised and integrated into the EIA Report. The EIA Report will be released for a 30-day I&AP and authority review period. All registered I&APs on the project database will be notified in writing of the release of the EIA Report for review. Comments raised, through written correspondence (emails, comments, forms) will be captured in a Comments and Responses Trail for inclusion in the EIA Reports that will be submitted to the authorising authority for decision-making in terms of Regulation 23 (1) (a) of the 2014 amended EIA Regulations. Comments raised will be responded to by the EIA team and/or the applicant. These responses will indicate how the issue has been dealt with in the EIA Process. Should the comment received fall beyond the scope of this EIA, clear reasoning will be provided. All comments received (and the associated responses from the EIA team) will be attached as an appendix to the EIA Report for submission to the authorising authority.

The EIA Report will include an EMPr, which will be prepared in compliance with the relevant regulations (i.e. Appendix 4 of the 2014 amended EIA Regulations). This EMPr will be based broadly on the environmental management philosophy presented in the ISO 14001 standard, which embodies an approach of continual improvement. Actions in the EMPr will be drawn primarily from the management actions in the specialist studies for the construction and operational phases of the project. If the project components are decommissioned or re-developed, this will need to be done in accordance with the relevant environmental standards and clean-up/remediation requirements applicable at the time.

7.3 Public Partisipation Process

The key steps in the PPP for the EIA Phase are described below. This approach will be confirmed with the provincial and national environmental authorities through their review of the PSEIA.

The PPP for the Scoping Process is described in Section 3 of this Scoping Report. All advertisements, notification letters and emails etc. will serve to notify the public and organs of state of the availability of all reports for the project and will provide I&APs with an opportunity to comment on the reports.

Step 1:

The first step in the process will entail the release of the EIA Reports for a 30-day I&AP and stakeholder review period. Relevant organs of state and I&APs will be informed of the review process in the following manner:

- A letter will be sent via registered mail and email to all registered I&APs and organs of state (where postal, physical and email addresses are available) on the database. The letter will include an Executive Summary of the EIA Reports and a Comment and Registration Form.

The EIA Reports will be made available and distributed through the following mechanisms to ensure access to information on the project and to communicate the outcome of specialist studies:

- Copies of the reports will be placed at the Prieska local library for I&APs to access for viewing;
- Key authorities will be provided with either a hard copy and/or CD of the EIA Reports;
- The EIA Reports will be uploaded to the project website (i.e. www.green-box.co.za) and;
- Telephonic consultations will be held with key I&AP and organs of state groups, as necessary.

Step 2:
A key component of the EIA Process is documenting and responding to the comments received from I&APs and the authorities. The following comments on the EIA Reports will be documented:

- Written and emailed comments (e.g. letters and completed comment and registration forms);
- Telephonic communication with Green-Box project team; and
- One-on-one meetings with key authorities and/or I&APs (if required).

The comments received during the 30-day review of the EIA Reports will be compiled into a Comments and Responses Trail for inclusion in an appendix to the EIA Reports that will be submitted to the authorising authority in terms of Regulation 23 (1) (a) for decision-making. The Comments and Responses Trail will indicate the nature of the comment, as well as when and who raised the comment. The comments received will be considered by the EIA team and appropriate responses provided by the relevant member of the team and/or specialist. The response provided will indicate how the comment received has been considered in the EIA Reports for submission to the authorising authority and in the project design or EMPRs.

Step 3:
Following the 30-day commenting period of the EIA Reports and incorporation of the comments received into the reports, the EIA Reports (i.e. hard copies and electronic copies) will be submitted to the authoring authority for decision-making in line with Regulation 23 (1) of the 2014 amended EIA Regulations. In line with best practice, I&APs on the project database will be notified via email (where email addresses are available) of the submission of the EIA Reports to the authoring authority for decision-making.

The EIA Reports that are submitted for decision-making will also include proof of the PPP that was undertaken to inform organs of state and I&APs of the availability of the EIA Reports for the 30 day review (during Step 1, as explained above). To ensure ongoing access to information, copies of the EIA Reports that are submitted for decision-making and the Comments and Response Trail (detailing comments received during the EIA Phase and responses thereto) will be placed on the project website www.green-box.co.za).

The authoring authority will have 107 days (from receipt of the EIA Reports) to either grant or refuse EA (in line with Regulation 24 (1) of the 2014 amended EIA Regulations).

Step 4:
Subsequent to the decision-making phase, if an EA is granted by the authorising authority for the proposed projects, all registered I&APs and stakeholders on the project database will receive notification of the issuing of the EA and the appeal period. The 2017 EIA Regulations (i.e. Regulation 4 (1)) states that after the Competent Authority has a reached a decision, it must inform the Applicant of the decision, in writing, within 5 days of such decision. Regulation 4 (2) if the 2017 EIA Regulations stipulates that I&APs need to be informed of the EA and associated appeal period within 14 days of the date of the decision. All registered I&APs will be informed of the outcome of the EA and the appeal procedure and its respective timelines.

The following process will be followed for the distribution of the EA (should such authorisation be granted by the authoring authority) and notification of the appeal period:

- A letter will be sent via registered mail and email to all registered I&APs and organs of state (where postal, physical and email addresses are available) on the database. The letter will include information on the appeal period, as well as details regarding where to obtain a copy of the EA;
- A copy of the EA will be uploaded to the project website (www.green-box.co.za) and;
- All I&APs on the project database will be notified of the outcome of the appeal period in writing.

7.3.1 Authority Consultation during the EIA Phase

Authority consultation is integrated into the PPP, with additional one-on-one meetings held with the lead authorities, where necessary. It is proposed that the Competent Authority as well as other lead authorities will be consulted at various stages during the EIA Process. At this stage, the following authorities have been identified for the purpose of this EIA Process (additional authorities might be added to this list as the EIA Process proceeds):

- Department of Agriculture, Environmental Affairs, Rural Development and Land Reform, Northern Cape Province;
- DWS of the Northern Cape Province;
- Department of Energy of the Northern Cape Province;
- Department of Mineral Resources of the Northern Cape Province;
- Eskom Holdings SOC Ltd;
- Department of Social Development;
- National Energy Regulator of South Africa;
- DAFF of the Northern Cape Province;
- Department of Public Works, Roads and Transport of the Northern Cape Province;
- Department of Labour;
- SKA;
- SAHRA;
- Ngwao Boswa Kapa Bokoni (Heritage Northern Cape);
- South African Civilian Aviation Authority;
- South African National Road Agency Limited;
- Pixley Ka Seme District Municipality;
- Siyathemba Local Municipality.

The authority consultation process for the EIA Phase is outlined in Table 22 below.

Table 22: Authority communication schedule

Stage in EIA Phase	Form of Consultation
During EIA Process	Presentation to authorities, and site visit if required
During preparation of the EIA Report	Communication with competent authority on the outcome of Specialist Studies
On submission of the EIA Report for decision-making	Meetings with dedicated departments, if requested by the Authoring authority, with jurisdiction over particular aspects of the project (e.g. Local Authority) and potentially including relevant specialists.

7.4 Approach to Impact Assessment

7.4.1 Assessment methodology

Assessment Criteria for Environmental Impacts

Cumulative Effects

It is important to assess the natural environment using a systems approach that will consider the cumulative impact of various actions. Cumulative impact refers to the impact on the environment, which results from the incremental impact of the actions when added to other past, present and reasonably foreseeable future actions regardless of what agencies or persons undertake such actions. Cumulative impacts can result from individually minor but collectively significant actions or activities taking place over a period of time. Cumulative effects can take place so frequently in time that the effects cannot be assimilated by the environment.

An assessment of the impact that the proposed development may have on the environment includes evaluating the impact according to a series of assessment criteria. This will be undertaken by considering the effects that may result should the impact occur.

Impact Assessment

The assessment of impacts was based on specialist's expertise, Green-Box professional judgement, field observations and desk-top analysis. The significance of potential impacts that may result from the proposed project was determined in order to assist decision-makers, specifically the competent authority and other relevant authorities, but to some extent also the proponent.

The **significance** of an impact is defined as a combination of the **consequence** of the impact occurring and the **probability** that the impact will occur. The criteria used to determine the consequence of the impacts assessed for the proposed project are listed in Table below, along with the ratings and rating definitions applicable to each consequence criterion.

Table 23: Criteria used to determine the consequence of an impact

Rating	Definition of Rating	Score
A. Extent– the area over which the impact will be experienced		
Local	Confined to project area or part thereof	1
Regional	Defined by regional context of study area, i.e. the WCDM and/or quaternary catchment	2
(Inter)national	Nationally and/or beyond	3
B. Intensity– the magnitude of the impact in relation to the sensitivity of the receiving environment, taking into account the degree to which the impact may cause irreplaceable loss of resources		
Low	Site-specific and wider natural and/or social functions and processes are negligibly altered	1
Medium	Site-specific and wider natural and/or social functions and processes continue albeit in a modified way	2
High	Site-specific and wider natural and/or social functions or processes are severely altered	3
C. Duration– the timeframe over which the impact will be experienced and its reversibility		
Short-term	Up to 2 years and reversible	1
Medium-term	2 to 15 years and reversible	2
Long-term	More than 15 years and irreversible	3

The combined score of these three criteria corresponds to a *consequence rating*, as set out in Table 24.

Table 24: Method used to determine the consequence rating

Combined score (A+B+C)	3-4	5	6	7	8-9
Consequence rating	Very Low	Low	Medium	High	Very High

Once the consequence is derived, the probability of the impact occurring is considered, using the probability classifications presented in Table 25 below.

Table 25: Probability classification

Probability – the likelihood of the impact occurring	
Improbable	< 40% chance of occurring
Possible	40% - 70% chance of occurring
Probable	>70% - 90% chance of occurring
Definite	>90% chance of occurring

The overall **significance** of an impact is determined by considering the consequence rating and the probability classification using the rating system prescribed in Table 26 below.

Table 26: Impact significance rating

		Probability			
		Improbable	Possible	Probable	Definite
Consequence	Very Low	**INSIGNIFICANT**	**INSIGNIFICANT**	**VERY LOW**	**VERY LOW**
	Low	**VERY LOW**	**VERY LOW**	**LOW**	**LOW**
	Medium	**LOW**	**LOW**	**MEDIUM**	**MEDIUM**
	High	**MEDIUM**	**MEDIUM**	**HIGH**	**HIGH**
	Very High	**HIGH**	**HIGH**	**VERY HIGH**	**VERY HIGH**

Finally, the impact is also considered in terms of its status (positive or negative) and the confidence in the ascribed impact significance rating.

The prescribed system for considering impact status and confidence (in the assessment) is laid out in Table 27 below.

Table 27: Impact status and confidence classification

Status of Impact	
Indication whether the impact is adverse (negative) or beneficial (positive).	+ ve (positive – a 'benefit')
	– ve (negative – a 'cost')
Confidence in the assessment	
The degree of confidence in predictions based on available information, Terra Works judgment and/or specialist knowledge.	Low
	Medium
	High

The impact significance rating should be considered by authorities in their decision-making process based on the implications of ratings ascribed below:

- **INSIGNIFICANT**: the potential impact is negligible and will not have an influence on the decision regarding the proposed activity/development.
- **VERY LOW**: the potential impact is very small and should not have any meaningful influence on the decision regarding the proposed activity/development.
- **LOW**: the potential impact may not have any meaningful influence on the decision regarding the proposed activity/development.
- **MEDIUM**: the potential impact should influence the decision regarding the proposed activity/development.
- **HIGH**: the potential impact will affect the decision regarding the proposed activity/development.
- **VERY HIGH**: The proposed activity should only be approved under special circumstances.

Practicable mitigation and optimization measures are recommended, and impacts are rated in the prescribed way both without and with the assumed effective implementation of the recommended mitigation (and/or optimization) measures. Mitigation and optimization measures are either:

- **Essential**: measures that must be implemented and are non-negotiable; or
- **Best Practice**: recommended to comply with best practice, with adoption dependent on the proponent's risk profile and commitment to adhere to best practice, and which must be shown to have been considered and sound reasons provided by the proponent if not implemented.

Impacts will then be collated into the EMPr and these will include the following:

- Quantifiable standards for measuring and monitoring mitigatory measures and enhancements will be set. This will include a programme for monitoring and reviewing the recommendations to ensure their ongoing effectiveness.
- Identifying negative impacts and prescribing mitigation measures to avoid or reduce negative impacts. Where no mitigatory measures are possible this will be stated.
- Positive impacts will be identified and augmentation measures will be identified to potentially enhance positive impacts where possible.

Other aspects to be taken into consideration in the assessment of impact significance are:

- Impacts will be evaluated for the construction and operation phases of the development. The assessment of impacts for the decommissioning phase will be brief, as there is limited understanding at this stage of what this might entail. The relevant rehabilitation guidelines and legal requirements applicable at the time will need to be applied;
- Impacts will be evaluated with and without mitigation in order to determine the effectiveness of mitigation measures on reducing the significance of a particular impact;
- The impact evaluation will, where possible, take into consideration the cumulative effects associated with this and other facilities/projects which are either developed or in the process of being developed in the local area; and
- The impact assessment will attempt to quantify the magnitude of potential impacts (direct and cumulative effects) and outline the rationale used. Where appropriate, national standards are to be used as a measure of the level of impact.

7.5 Specialist Studies

In addition to the Terms of Reference listed below, the specialists will be guided by:

- Specialists Studies, Integrated Environmental Management, Information Series 4, which can be downloaded from the Department's website: www.environment.gov.za.

The following specialist studies have been identified based on the issues identified to date, as well as potential impacts associated with the project. The TORs for each specialist study are discussed in detail below. The specialist studies and associated specialists are shown in Table 28 below. Additional specialist studies could possibly be commissioned as a result of issues raised during the Scoping Process. It is important to note that due to the large number of existing studies completed in the area, as well as the large amount of research and information that is readily available, certain specialist studies (i.e. agricultural potential, and traffic) have not been commissioned, however, issues and impacts relating to these fields of expertise will still be considered in the EIA phase.

Table 28: Specialist commissioned for the Prieska Power Reserve PV Plant

SPECIALISTS		
Mr. Rikus Lampbrecht	Eco Focus	Ecological Impact Assessment, including terrestrial and surface water)
Dr. Lloyd Rossouw	Heritage	Heritage Impact Assessment (Archaeology, Palaeontology and Cultural Landscape)
Dr. Johan Van Niekerk	Ornithology	Avifauna Impact Assessment
Mr. Wian Esterhuizen	Visual	Visual Impact Assessment
Ms. An Kritzinger	Socio-Economic	Socio-Economic Impact Assessment

Terms Of Reference

Detailed ToR is included under Appendix E.

The following specialists' studies will be carried out:

A. *ECOLOGICAL*

Key Issues

- Impacts to protected fauna and flora species.
- Impacts on the vegetation type;

Approach

- Undertake baseline survey and describe affected environment within the project footprint;
- Take into consideration the Free State Biodiversity Plan;
- Assess the current ecological status and the conservation priority within the project footprint;
- Undertake sensitivity study to identify protected species, Red Data species and alien species;
- Compile a plant rescue and protection plan which allows for the maximum transplant of conservation of important species from areas to be transformed.
- Prepare maps that indicate critical biodiversity areas and ecological support areas; critical endangered and endangered vegetation areas; and
- Recommend the preferred alternatives.

B. *WETLAND AND DRAINAGE LINE DELINIATION*

Key Issues

- Impact on wetlands (water courses is defined as wetlands, DWS);
- Impact on drainage lines.

Approach

- Delineate all wetlands as per the guideline by DWAF 2005
- Provide suitable mitigation measures to protect watercourses during project life-cycle;
- Recommend monitoring programme and measures to protect hydrological features and other sensitive features from construction impacts including spillages;
- Prepare a map as per National Freshwater Priority Areas including buffer zones.

C. *HERITAGE AND PALEONTOLOGICAL IMPACT ASSESSMENT*

Key Issues

- Potential occurrence of heritage resources, paleontological objects, graves and structures older than 60 years within project footprint.
- Impact on graves- community member suggested there might be graves within the site.

Approach

- Undertake a Phase 1 Heritage Impact Assessment in accordance with the South African Heritage Resources Act (No. 25 of 1999);
- Undertake baseline study indicating the location of heritage resources, the nature and degree of significance and the present physical condition;
- Prepare a heritage sensitivity map, based on the findings of the study;
- Identify heritage resources to be monitored.

D. AVI-FAUNA

Key Issues

- Impact on avi-fauna.

Approach

- Provide a description of the study area pertaining to the solar plant sensitive avi-fauna;
- Identify concerns and potential impacts on avifauna;
- Highlight sensitive and possible no-go areas;
- Provide an evaluation of the envisaged impacts on sensitive avifauna; and
- Provide recommendations on the envisaged impacts on avifauna and preferred alternatives; and
- Prepare a map that indicate locations of birds and bats including roosting and foraging.

NB: It is important to note that the study will be conducted according to the best practice guidelines for "assessing and monitoring the impact of solar power generating facilities on birds in Southern Africa" compiled by **BirdLife** in **January 2017.** Compliance with these guidelines will be included in the Avifaunal Specialist Study that will be conducted in the EIA phase.

E. SOCIO-ECONOMICS

Key Issues

- Impact on economy and GDP of the region.

Approach

- Study on social upliftment contribution;
- Study on Job creation;
- Positive change of land use;
- Renewable energy contribution.

F. VISUAL

Key Issues

- Impact on natural features and social disturbance of the region.

Approach

- Refining the baseline (Scoping) description of the visual character of the site and zone of visual influence;
- Refining the list of identified visual impacts resulting from the proposed installations (with consideration of any public and/or relevant authorities' concerns);
- Evaluating the visual impacts based on standard Visual Impact Assessment (VIA) rating criteria, namely:
    - Quality of landscape – the aesthetic excellence and significance of the visual resources and scenery;
    - Visual absorption capacity – the potential of the landscape to conceal the proposed development;
    - Visibility – including:
    - the ZVI as defined in the scoping report;
    - viewshed analysis – the geographic area from which the project may be visible (view catchment);
    - visibility from selected viewpoints;
    - Visual intrusion (or integrity) – the level of congruence or integration with existing landscape; and
    - Viewer sensitivity – the level of viewer sensitivity as influenced by the type and number of visual receptors.
- Assessing the significance of the visual impacts, through:
    - Severity, extent, duration and probability to determine consequence; and

- Consequence considered with status (positive or negative impact) and confidence to determine significance.

- Developing mitigation measures to reduce visual impacts and enhance any positive visual benefits; and
- Responding to stakeholder's queries and concerns, as required.

7.6 Environmental Impact Statement

The statement will summarize key findings of the Environmental Impact Assessment and compare the positive and negative implications of the proposed activity.

7.7 Environmental Management Programme (EMPr)

A draft Environmental Management Programme will be compiled, that addresses the impacts and the remediation measures recommended thereby ensuring that the significance of the identified negative impacts are at a minimum. The EMPr will also include the following:
i. A plant and rescue and protection plan;
ii. An alien invasive management plan;
iii. A storm water management plan;
iv. An erosion management plan.

8. REFERENCES

Crime Stats SA, 2020

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https://en-za.topographic-map.com/maps/77oq/Prieska/

IRENA and CEM (2014), 'The socio-economic benefits of large-scale solar and wind: an econValue report'

"MAIA, J.; GIORDANO, T.; KELDER, N.; BARDIEN, G.; BODIBE, M.; DU PLOOY, P.; JAFTA, X.; JARVIS, D.; KRUGER-CLOETE, E.; KUHN, G.; LEPELLE, R.; MAKAULULE. L.; MOSOMA, K.; NEOH, S.; NETSHITOMBONI, N.; NGOZO, T.; SWANEPOEL, J. (2011): GREEN JOBS: An estimate of the direct employment potential of a greening South African economy. Industrial Development Corporation, Development Bank of Southern Africa, Trade and Industrial Policy Strategies.

Mucina, L. & Rutherford, M.C. (eds.) 2006. The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

Municipal Demarcation Board, 2018

National Environmental Management Act (Act 107 of 1998)

National Environmental Management: Biodiversity Act (Act 10 of 2004)

National Environmental Management: Biodiversity Act (Act 10 of 2004); Alien and Invasive Species Regulations, 2014

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National Forests Act (Act 84 of 1998)

National Water Act (Act 36 of 1998)

New Climate Institute, Climate Analytics. 2019. Climate Action Tracker. Climate Governance, Assessment of the government's ability and readiness to transform South Africa into a zero emissions society, CAT Climate Governance Series South Africa September 2019.

Northern Cape Provincial Treasury, 2019

SAHRIS palaentosensitivity map (2021)

Solar GiS, 2014

South African National Biodiversity Institute (2006-2019). The Vegetation Map of South Africa, Lesotho and Swaziland, Mucina, L., Rutherford, M.C. and Powrie, L.W. (Editors)

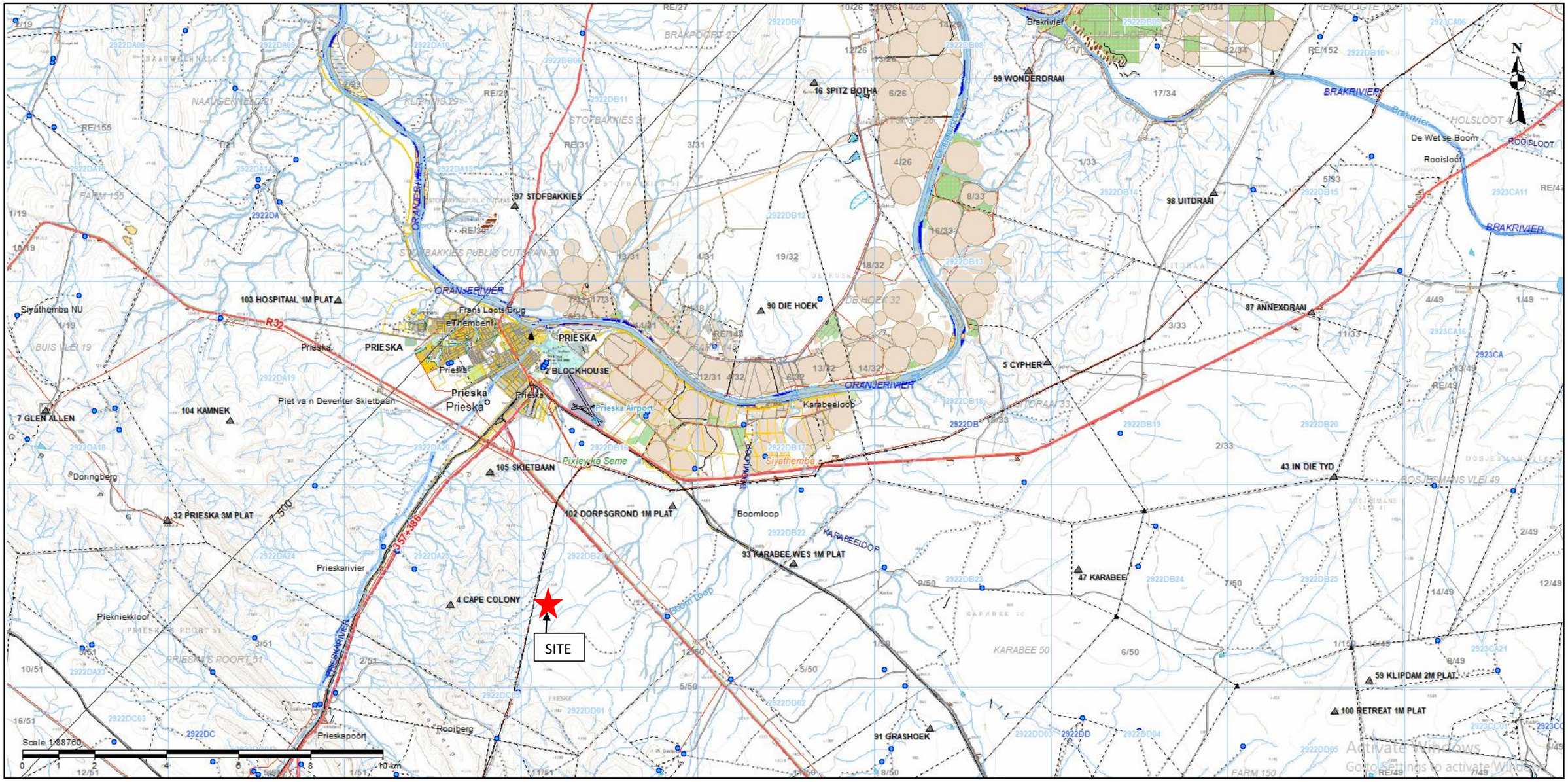
Stats SA, 2019 (b) (National Poverty Lines)

Stats SA Census, 2011 and Stats SA Community Survey, 2016

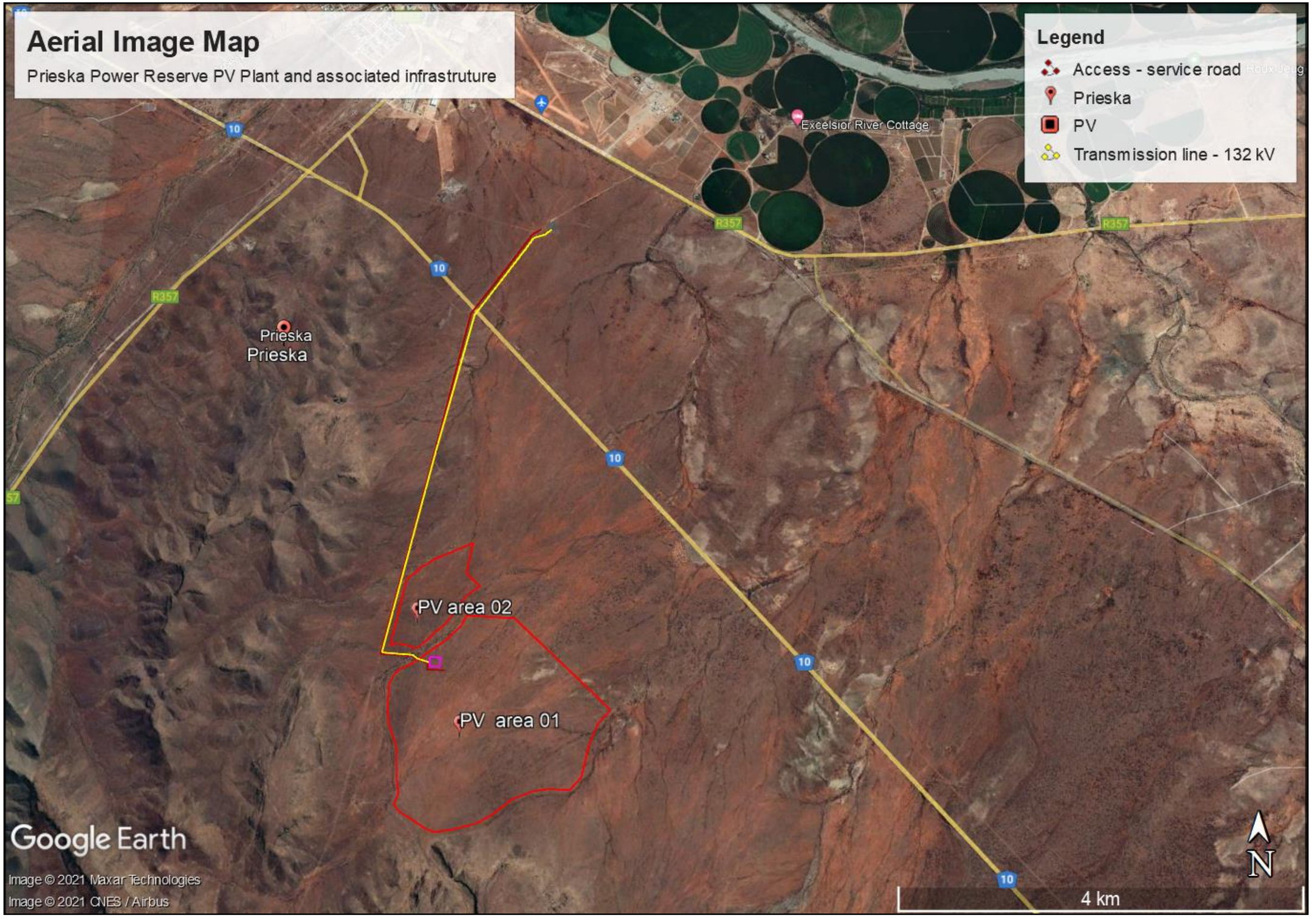
www.climate-data.org

9. APPENDIXES

Appendix A – location maps



Location Map: Prieska P{ower Reserve PV Plant



Aerial Image Map: Prieska Power Reserve PV Plant and associated infrastructure

Appendix B – details of EAP and expertise

DRAFT SCOPING REPORT PREPARED BY: Danie Krynauw

CONTACT DETAILS:

Green-Box Consulting
P.O. Box 37738
Langenhovenpark
9330

Tel: 082 435 2108
Email: danie@green-box.co.za

QUALIFICATIONS OF EAP:

Danie Krynauw has a Master's degree in Town and Regional Planning from the University of the Free State (UFS), and completed various environmental management courses at UFS, UNW and Pretoria University. Danie has over 18 years' experience in the environmental management field, and is a registered EAP (EAPASA – 2019/1348), he is also member of the International Association of Impact Assessments South Africa (IAIAsa).

CURRICULUM VITAE – DANIE KRYNAUW

1. Family name: Krynauw
2. First name: Daniël
3. Date of birth: 14/12/1971
4. Nationality: South African
5. Contacts: Cell: 082 435 2108
   Email: danie@green-box.co.za

6. Education:

Institution	Degree(s) or Diploma(s) obtained
University of the Free State 2001 – 2002	Master in Environmental Management – Dissertation pending
University of the Free State 1996 – 1998	Masters in Urban and Regional Planning
University of the Free State 1993 – 1995	BA Geography and Sociology

7. Membership of professional bodies:
   - EAPASA – 2019/1348
   - International Association of Impact Assessment South Africa (IAIAsa)

8. Present position:
   - Environmental Scientist / Director – Green-Box Consulting

9. Current Responsibilities:
   - Liaising with clients in both the private and public sectors.
   - Conduct Environmental Impact Assessments and other Environmental Technical Investigations.
   - Apply and obtain waste licenses, water licenses, mining permits and environmental authorisations for clients.
   - Use different GIS datasets in order to create new information or investigate patterns for projects.
   - Conduct environmental compliance and other environmental audits.
   - Provide technical-level support for environmental remediation and mitigation projects, including remediation system design and determination of regulatory applicability for incoming projects.
   - Collaborate with other environmental scientists, planners, engineers, and other specialists, and experts in law and business etc. to address environmental problems for clients.
   - Conduct Environmental training.

10. Years within the organization:
    - 10 years

11. Other skills (e.g. computer literacy, etc.):
    - All suits of Microsoft Office, Arc View, ReGIS, and Project Professional.

12. Professional experience:

Date	2011 – Current
Organisation	Green-Box Consulting (Environmental Consultants)
Position	Environmental Scientist (Owner and Director)

Date	2009 – 2016
Organisation	Terra Works Environmental Consultants
Position	Senior Environmental Scientist and COO

Date	2001 – 2009
Organisation	Department of Economic Development, Tourism and Environmental Affairs, Free State
Position	Principal Environmental Officer
Description of duties	• Review Environmental Impact Assessments • Review Environmental Management Programmes • Issuing Environmental Authorisations

Appendix D – scoping phase public participation

1. Two perimeter site notices placed on 14 November 2021;
2. Advert placed in the local newspaper the Gemsbok on 17 November 2021;
3. Hard copy of the draft scoping report placed at the Public Library, and one placed at the Siyathemba Local Municipal offices;
4. Notices placed at the public library and a notice placed at the Siyathemba Municipality offices;
5. Digital copy of the draft scoping report emailed to identified Stakeholders;
6. Placement of the Draft Scoping Report on www.green-box.co.za

Site notices

1. Two site notices were placed at the perimeter of the proposed site.

   1.1 Site notice 1 - 29°42'14.73"S, 22°45'35.83"E
   1.2 Site notice 2 - 29°43'44.40"S, 22°47'9.21"E

NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

PUBLIC PARTICIPATION PROCESS

170MW PRIESKA POWER RESERVE PV PLANT AND ASSOCIATED INFRASTRUCTURE PROJECT

NORTHERN CAPE PROVINCE

Project Name: Prieska Power Reserve PV Plant and associated infrastructure Project

Applicant: Prieska Power Reserve (Pty) Ltd

Project Location: Portion of the Remaining Extent of Erf 1, Prieska, approximately 5km south of Prieska in the Siyathemba Local Municipality in the Northern Cape.

Proposed Activity: The construction of a photovoltaic (PV) solar Plant with a contracted capacity of up to 170MW. The extent of the broader site is 384ha and the development footprint <250ha, and will include the following infrastructure:

- PV Plant with internal substation;
- Associated infrastructure – access road, security fence & gate, and office building with ablutions;
- 132kV overhead powerline (to connect to the Burcell substation).

Environmental Impact Assessment Process: In terms of Section 24 and 24D of the National Environmental Management Act (No 107 of 1998), as read with Government Notice R324 -327, a Scoping and EIA is required to be undertaken for the proposed project. Green-Box Consulting is undertaking the required environmental assessment and public participation process.

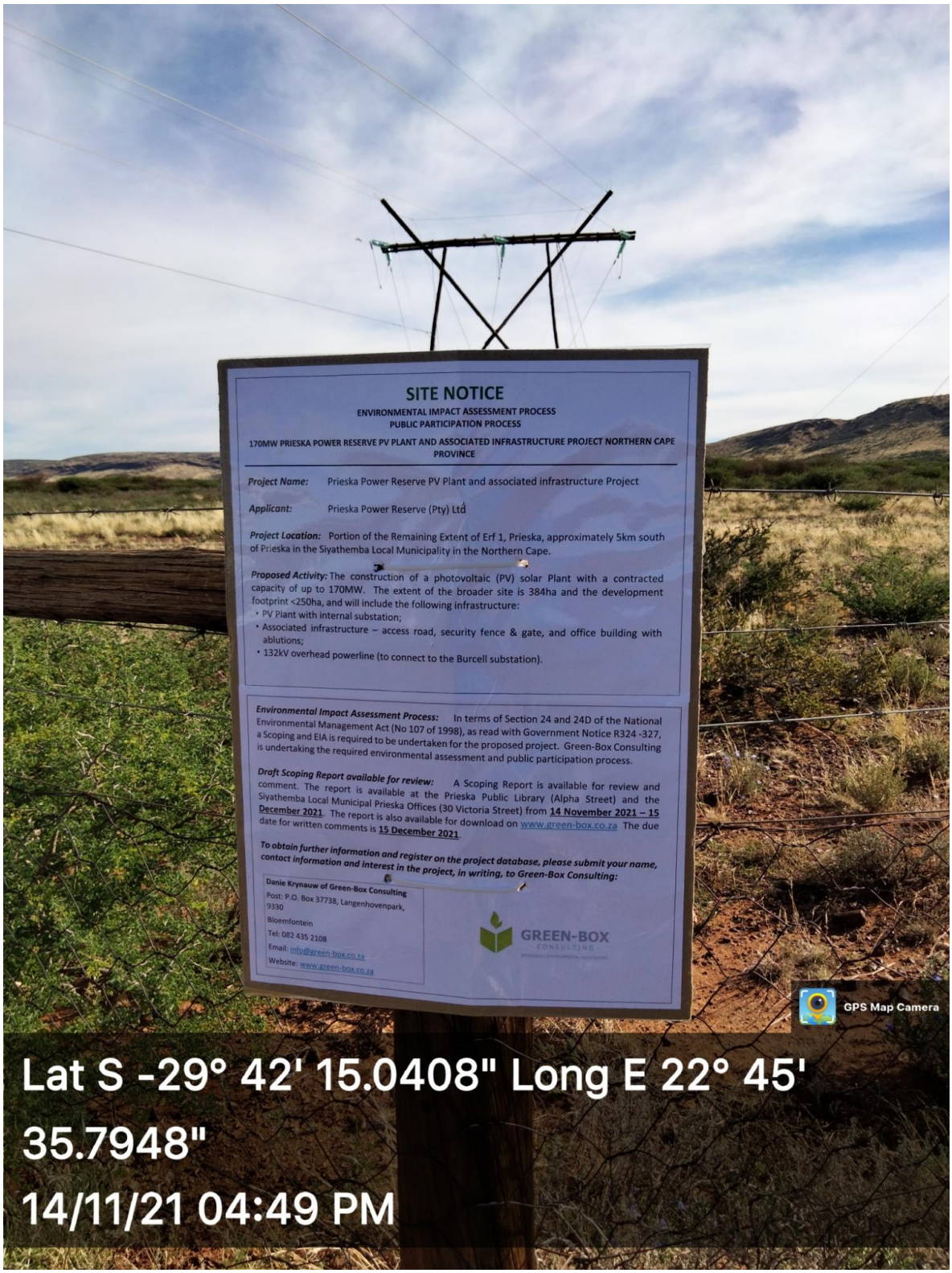
Draft Scoping Report available for review: A Scoping Report is available for review and comment. The report is available at the the Prieska Public Library (Alpha Street) and the Siyathemba Local Municipal Prieska Offices (30 Victoria Street) from **14 November 2021 – 15 December 2021**. The report is also available for download on www.green-box.co.za The due date for written comments is **15 December 2021**.

To obtain further information and register on the project database, please submit your name, contact information and interest in the project, in writing, to Green-Box Consulting:

Danie Krynauw of Green-Box Consulting
Post: P.O. Box 37738, Langenhovenpark, 9330
Bloemfontein
Tel: 082 435 2108
Email: info@green-box.co.za
Website: www.green-box.co.za

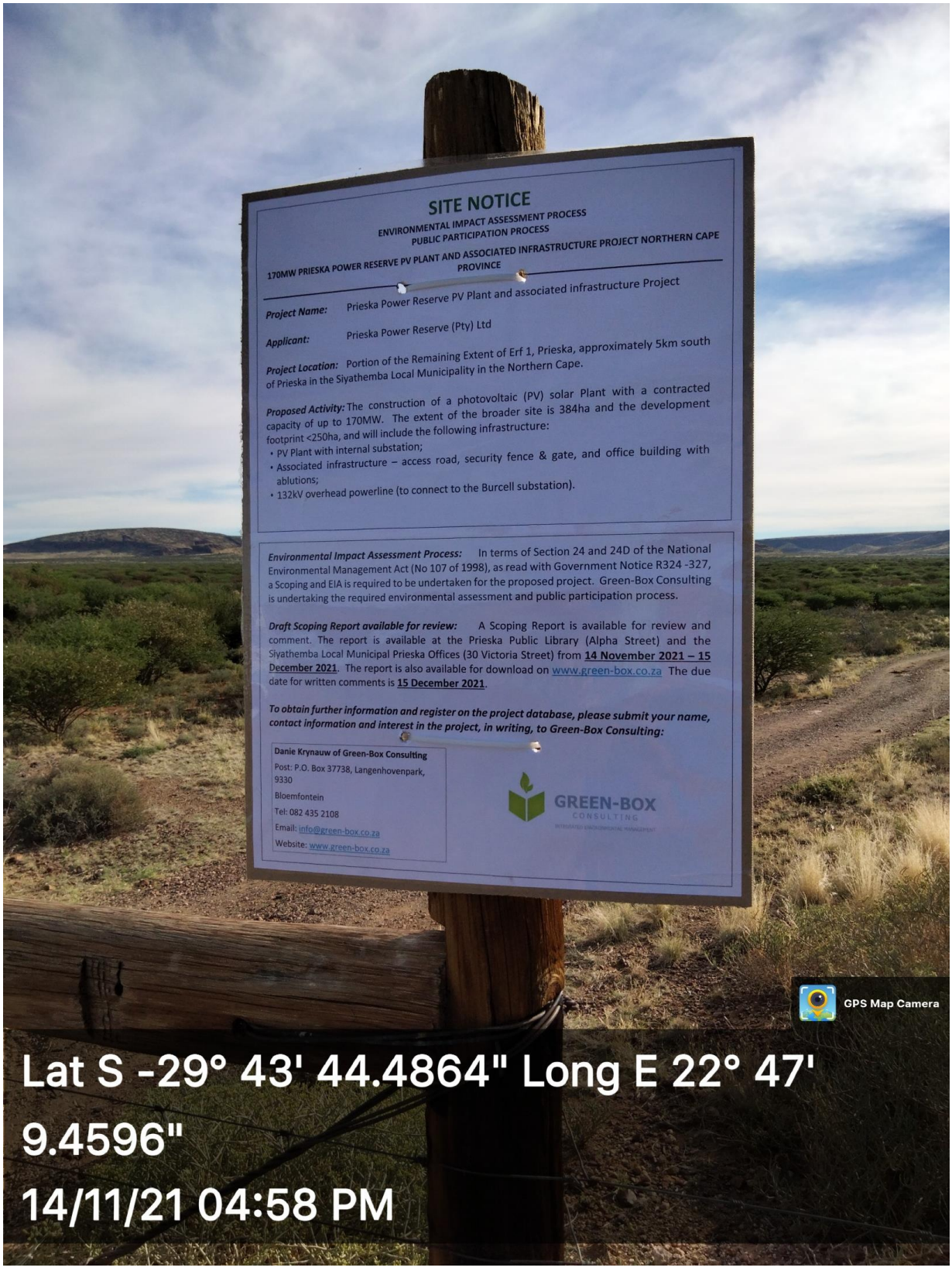
GREEN-BOX CONSULTING
INTEGRATED ENVIRONMENTAL MANAGEMENT

Site notice 1: Placed at the entrance to the proposed access road leading to the site (next to the N10 road)



Site notice 1: Zoomed in

Site notice 2: Placed along the N10 road nearest perimeter to the site on the southern side



Site notice 2: Zoomed in

Placement of an advert in the Gemsbok newspaper of 17 November 2021

NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

PUBLIC PARTICIPATION PROCESS

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Tel: 082 435 2108
Email: info@green-box.co.za
Website: www.green-box.co.za

GREEN-BOX CONSULTING
INTEGRATED ENVIRONMENTAL MANAGEMENT

Placement of draft Scoping Report at the Prieska Library

Photo 1: Draft Scoping Report places at the Prieska Municipal Library

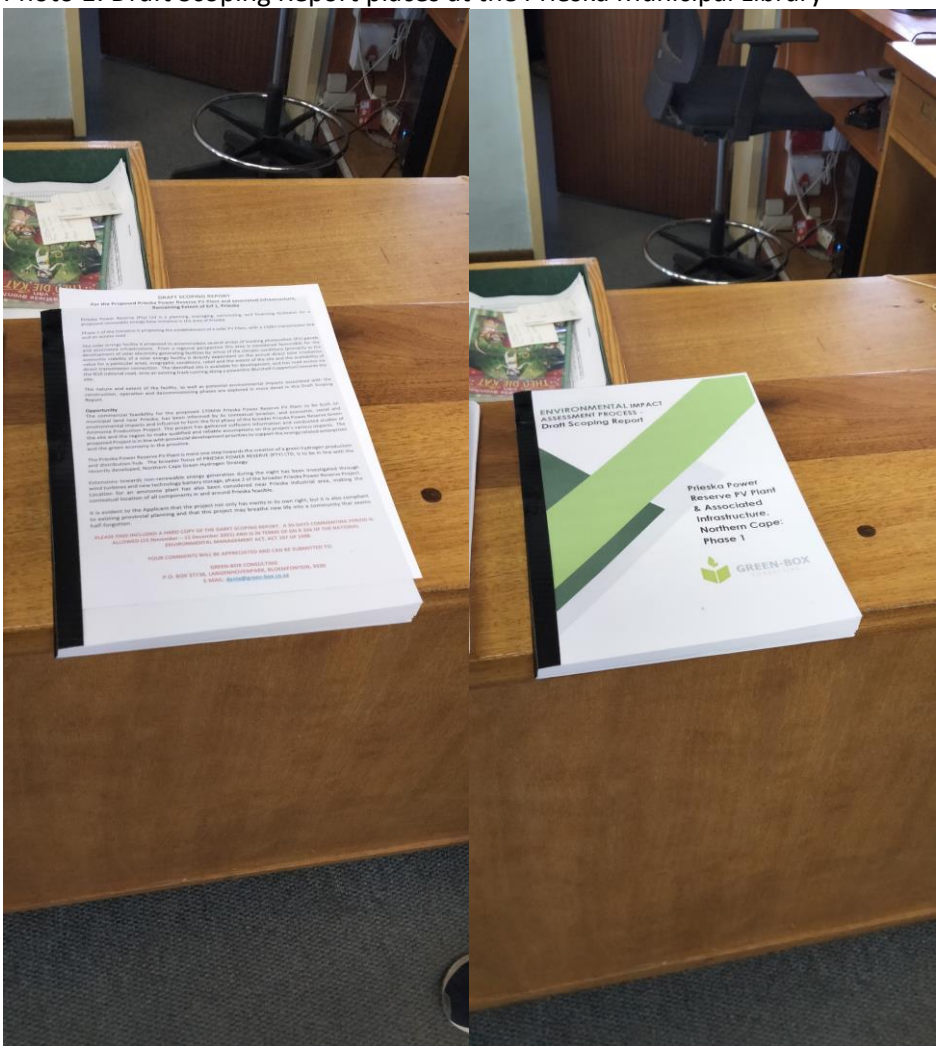

Photo 2 and 3: Closeup photo of the document

Photo 4: Notice placed at the entrance to the library

EIA NOTICE

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS
PUBLIC PARTICIPATION PROCESS

170MW PRIESKA POWER RESERVE PV PLANT AND ASSOCIATED INFRASTRUCTURE PROJECT NORTHERN CAPE PROVINCE

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Bloemfontein
Tel: 082 435 2108
Email: info@green-box.co.za
Website: www.green-box.co.za

GREEN-BOX

Photo 5: Closeup photo if the notice at the library

Placement of draft Scoping Report at the Prieska Municipal Offices

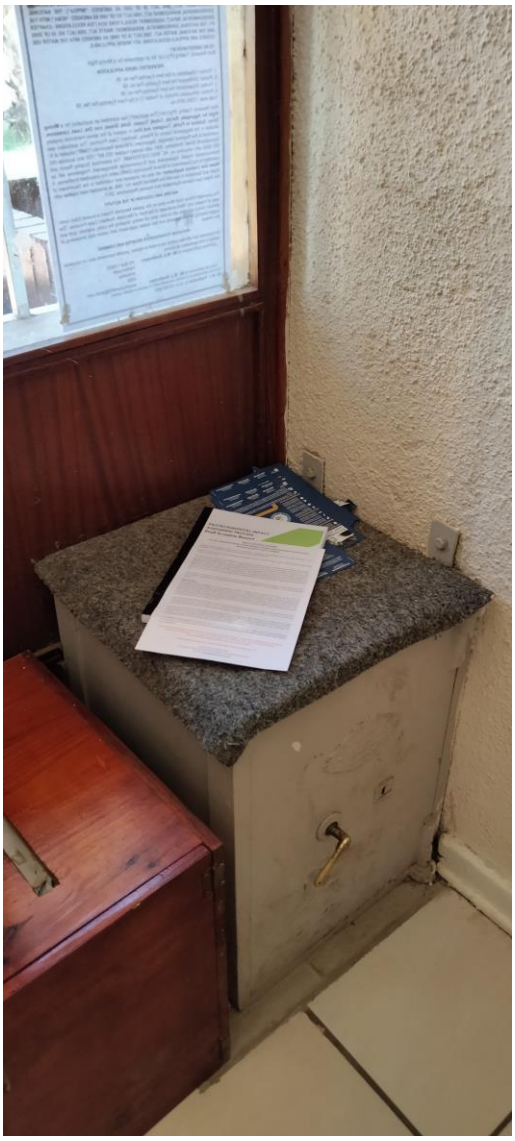

Photo 6: Draft scoping report placed at the Siyathemba Local Municipality main entrance, in Prieska

Photo 7: Zoomed out image of the draft scoping report placement

Photo 8: Notice placed at the entrance to the Siyathemba Local Municipality

Database of identified Stakeholders

First Name	Surname	Contacts	Company Organisation
Elsabe	Swart	elsabe.dtec@gmail.com 053 807 7300 082 585 2954	Provincial Department of Agriculture, Environmental Affairs, Rural Development and Land Reform, Directorate, Biodiversity
Gawie	Van Dyk	vandykg@dws.gov.za 053-830 8800	Department of Water and Sanitation
Jacoline	Mans	jacolinem@daff.gov.za 060 973 1660	Provincial DAFF
Mashudu	Marubini	mashudum@daff.gov.za 012-319 7547	National Department of Agriculture, Forestry and Fisheries (DAFF)
Elizabeth	Taylor	Elizabeth.taylor@nersa.org.za info@nersa.org.za 012-401 4033	National Energy Regulator of South Africa
IA Natasha	Bulane Corns	knogwili@ncpg.gov.za; drpw-info@ncpg.gov.za ncorns@ncpg.gov.za 054-332 4473	Department of Transport, Roads and Public Works
Colene Rene	Runkel De Kock	runkelc@nra.co.za; dekockr@nra.co.za 021-957 4600	South African National Roads Agency Limited - Northern Cape (Western Region)
Shireen	Mohammed	053-874 9100	Department of Social Development, NC
Ratha	Timothy	rtimothy@nbkb.org.za ratha.timothy@gmail.com 053-831 2537; 079 036 9695	Northern Cape Provincial Heritage Resources Authority
Harry Koos	Roberts Pretorius	obstacles@caa.co.za; pretoriusk@caa.co.za; mail@caa.co.za 011-545 1000; 011-545 1232	South African Civilian Aviation Authority
John	Geeringh	csonline@eskom.co.za; johan.geeringh@eskom.co.za 011-516 7233	ESKOM
Adrian	Tiplady	atiplady@ska.ac.za 011-442 2434	Department of Science and Technology SKA SA
Mamello	Ratikane	info@energy.gov.za 053-836 4000	Department of Energy Northern Cape
M Natasha	Manong Higgitt	mmanong@nc.sahra.org.za; nhiggitt@sahra.org.za 021-462 4502	South African Heritage Resources Agency
R. Vincent	Matsoso Muila	rmatsoso@ncpg.gov.za eugene.nkatlholang@dmr.gov.za	Department of Mineral Resources

First Name	Surname	Contacts	Company Organisation
Itumeleng	Thatelo	ithatelo@salga.org.za 053-833 3828	SALGA, environmental manager
Johan	Koegelenberg	koegelenbergj@sentech.co.za	SENTECH
IWJ	Stadhouer	mm@siyathemba.gov.za 053-492 3369	Siyathemba Local Municipality
Rodney	Pieterse	pixley@telkomsa.net 053-631 0891	Pixley Ka Seme District Municipality
Stakeholders (NGOs and Conservation Organisations)			
Simon	Gear	info@birdlife.org.za; conservation@birdlife.org.za 011-789 1122	Birdlife South Africa
Praneel	Ruplal	pruplal@icasa.org.za 0832621057	Independent Communications Authority of South Africa (ICASA)
Landowner/Adjacent Landowners			
Petrus	Nel	Grashoek.prieska@gmail.com 0833838316	Karabee 5/50
Frans	Lotz	vankerk@mjvn.co.za 0837919072	Prieska Poort 51

Appendix E – Specialist terms of reference

1. Specialist commissioned, Terms of Reference

GREEN-BOX
CONSULTING

51 Willie du Plessis
Fichardtpark
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C 082 435 2108
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info@green-box.co.za
W www.green-box.co.za

13 July 2021

Dr. D.J. van Niekerk
P.O. Box 11987
Universitas
BLOEMFONTEIN
9321

Attention: Mr. Johan van Niekerk

RE: TERMS OF REFERENCE, PRIESKA POWER RESERVE INDUSTRIAL HUB PHASE 1 – AVIFAUNAL IMPACT ASSESSMENT SPECIALIST STUDY

Green-Box Consulting has been appointed as the Environmental Assessment Practitioner (EAP) for the proposed Prieska Power Reserve Industrial Hub Phase 1 Project.

In terms of the National Environmental Management Act, Act 107 of 1998, and its current 2014 Regulations (as amended), prior environmental authorisation is required for the development. Application procedure to obtain environmental authorisation necessitates a Scoping/EIR process to be followed. To inform this process, Specialist inputs are required. Specialist input applicability is also determined by the National Department of Forestry, Fisheries and THE Environment, environmental screening tool, a web-based tool, that identify project site sensitivities and therefore specialist assessments to determine sensitivities significance.

An Avifaunal Impact Assessment has been identified as a requirement for the Prieska Power Reserve Industrial Hub Project's, EIA application.

Your assistance with this specialist study is appreciated. As the main EAP for the project the following Terms of Reference for your assessment is presented to assure the report results are in line with the Authorising Authority requirements:

Note that the National Department of Forestry, Fisheries, and the Environment (DFFE), gazetted a set of Protocols for the assessment and minimum report content requirements of environmental impacts for various environmental themes. Avifauna is a theme applicable for the Prieska Project. The gazetted minimum set of assessment and reporting criteria must form the basis of your specialist investigation (find included gazetted Protocol for the assessment and reporting of environmental impacts on avifauna species by large scale onshore wind facilities).

During the first phase of the assessment (Scoping Phase) the scope of work to be included:

- Conduct a field investigation to determine the bird community present in the study area. Although the general bird community is considered, this study will have special focus on the species considered to be more sensitive to wind energy development related impacts;

- Describe the affected environment from an avifaunal perspective, including consideration of the surrounding habitats and avifaunal features (e.g. Ramsar sites, Critical Bird Areas, wetlands, migration routes, feeding, roosting & nesting areas, etc);
- Describe and map bird habitats on the site, based on on-site monitoring, desk-top review, collation of available information, studies in the local area, previous experience, and the Wind and Solar SEA (CSIR, 2015), where applicable;
- Conduct a review of national and international specialised literature and experiences regarding birds and wind farms;
- Ensure that the Avifauna assessment be in compliance with relevant standards, policies, laws and regulations, specifically including the gazetted Protocol for the assessment and reporting of environmental impacts on avifauna species by large scale onshore wind facilities;
- Providing recommendations for the impact assessment phase. During the second phase of the assessment (Assessment Phase). The scope of work must included:

Terms of Reference for the EIR phase:

- Refining the baseline (Scoping) description of the avifauna character of the site;
- Refining the list of identified avifauna impacts resulting from the proposed installations (with consideration of any public and/or relevant authorities' concerns);
- Map the sensitivity of the site in terms of avifaunal features such as habitat use, roosting, feeding and nesting/breeding; and
- Identify and assess the potential impacts of the proposed project on avifauna, including impacts that may be seasonal or diurnal, or linked to specific species and their feeding, roosting or nesting habitats and habits. Provide sufficient mitigation measures to include in the Environmental Management Programme.
- Assessing the significance of the avifaunal impacts, through:
    - Severity, extent, duration and probability to determine consequence; and
    - Consequence considered with status (positive or negative impact) and confidence to determine significance.
- Identify and map sensitive and "no-go" areas within and around the proposed Wind, Solar and Industry Facility sites as well as associated infrastructure areas;
- Responding to stakeholder's queries and concerns, as required.
- Provide a statement regarding the potential significance of the identified issues based on the evaluation of the issues/impacts and a reasoned opinion as to whether the proposed project should be authorised; and
- Propose a suitable monitoring programme for the evaluation of the impacts expected during the construction and operational phase of the development, if considered necessary.

The avifauna impact assessment results will be incorporated by Green-Box Consulting in the EIA application reports. A specific timeline for completion will be determined and be presented to you for your own planning and scheduling purposes.

Yours faithfully

Danie Krynauw
Reg. EAP (EAPASA)

GREEN-BOX
CONSULTING

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13 July 2021

Attention: Mr. Rikus Lamprecht
Eco Focus
Bloemfontein
Cell: +27 (0) 72 230 9598
Email: ajhlamprecht@gmail.com

BY EMAIL

RE: PRIESKA POWER RESERVE INDUSTRIAL HUB PHASE 1 – ECOSYSTEM ENVIRONMENTAL ASSESSMENT SPECIALIST STUDY, TERMS OF REFERENCE

Green-Box Consulting has been appointed as the Environmental Assessment Practitioner (EAP) for the proposed Prieska Power Reserve Industrial Hub Phase 1 Project.

In terms of the National Environmental Management Act, Act 107 of 1998, and its current 2014 Regulations (as amended), prior environmental authorisation is required for the development. Application procedure to obtain environmental authorisation necessitates a Scoping/EIR process to be followed. To inform this process, Specialist inputs are required. Specialist input applicability is also determined by the National Department of Forestry, Fisheries and Environment, environmental screening tool, a web-based tool, that identify project site sensitivities and therefore specialist assessments to determine sensitivities significance.

A Terrestrial and Aquatic Ecosystem Impact Assessment has been identified as a requirement for the Prieska Power Reserve Industrial Hub Project's, EIA application.

Your assistance with this specialist study is appreciated. As the main EAP for the project the following Terms of Reference for your assessment is presented to assure the report results are in line with the Authorising Authority requirements:

Note that the National Department of Forestry, Fisheries and the Environment (DFFE), gazetted a set of Protocols for the assessment and minimum report content requirements of environmental impacts for various environmental themes. Terrestrial and Aquatic Ecosystems is a theme applicable for the Prieska Project. The gazetted minimum set of assessment and reporting criteria must form the basis of your specialist investigation.

During the first phase of the assessment (Scoping Phase) the scope of work to be included:

- Conduct a field investigation to description the vegetation occurring in, or in the area surrounding the study areas;
- Describe the affected environment from a terrestrial and wetland/watercourse perspective, including consideration of the surrounding habitats and ecological features (e.g. Ramsar sites, Critical Biodiversity Areas, wetlands, etc);
- Describe the conservation importance of the vegetation in local and regional terms;
- Describe and map habitats/ ecological areas on the site, based on on-site monitoring, desk-top review, collation of available information, studies in the local area, previous experience;

- Ensure that the Ecological assessment be in compliance with relevant standards, policies, laws and regulations, specifically including the gazetted Protocol for the assessment and reporting of environmental impacts on terrestrial and aquatic environments;
- Providing recommendations for the impact assessment phase. During the second phase of the assessment (Assessment Phase). The scope of work must included:

Terms of Reference for the EIR phase:

- Refining the baseline (Scoping) description of the terrestrial and aquatic/watercourse character of the site;
- Refining the list of identified ecological impacts resulting from the proposed installations (with consideration of any public and/or relevant authorities' concerns);
- Map the sensitivity of the site in terms of biodiversity features such as habitat use, water courses, protected trees, and plant communities, etc; and
- Identify and assess the potential impacts of the proposed project on biodiversity and water features, including impacts that may be seasonal or diurnal, or linked to specific species and their habitats and habits. Provide sufficient mitigation measures to include in the Environmental Management Programme.
- Assessing the significance of the impacts identified, through:
    - Severity, extent, duration and probability to determine consequence;
    - All possible cumulative ecological impacts that could result from the proposed project facilities, indicating whether these impacts are related to the design, construction or operational phases, and recommending measures aimed at avoiding and/or mitigating each potential impact, and
    - Consequence considered with status (positive or negative impact) and confidence to determine significance.
- Identify and map sensitive and "no-go" areas within and around the proposed Wind, Solar and Industry Facility sites as well as associated infrastructure areas;
- Responding to stakeholder's queries and concerns, as required;
- Provide a statement regarding the potential significance of the identified issues based on the evaluation of the issues/impacts and a reasoned opinion as to whether the proposed project should be authorised; and
- Propose a suitable monitoring programme for the evaluation of the impacts expected during the construction and operational phase of the development, if considered necessary.

The Ecological impact assessment results will be incorporated by Green-Box Consulting in the EIA application reports. A specific timeline for completion will be determined and be presented to you for your own planning and scheduling purposes.

Yours faithfully

Danie Krynauw
Reg. EAP (EAPASA)

GREEN-BOX
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19 July 2021

Attention: Dr. Lloyd Rossouw
Paleo Field Services
PO Box 38806
Langenhovenpark
Bloemfontein,
Free State 9330

BY EMAIL

RE: PRIESKA POWER RESERVE INDUSTRIAL HUB PHASE 1 – HERITAGE, ARCHAEOLOGY AND PALAENTOLOGY ASSESSMENT SPECIALIST STUDY, TERMS OF REFERENCE

Green-Box Consulting has been appointed as the Environmental Assessment Practitioner (EAP) for the proposed Prieska Power Reserve Industrial Hub Phase 1 Project.

In terms of the National Environmental Management Act, Act 107 of 1998, and its current 2014 Regulations (as amended), prior environmental authorisation is required for the development. Application procedure to obtain environmental authorisation necessitates a Scoping/EIR process to be followed. To inform this process, Specialist inputs are required. Specialist input applicability is also determined by the National Department of Forestry, Fisheries and Environment, environmental screening tool, a web-based tool, that identify project site sensitivities and therefore specialist assessments to determine sensitivities significance.

A Heritage, Archaeology and Palaeontological Impact Assessment has been identified as a requirement for the Prieska Power Reserve Industrial Hub Project's, EIA application.

Your assistance with this specialist study is appreciated. As the main EAP for the project the following Terms of Reference for your assessment is presented to assure the report results are in line with the Authorising Authority requirements:

Note that the National Department of Forestry, Fisheries and the Environment (DFFE), gazetted a set of Protocols for the assessment and minimum report content requirements of environmental impacts for various environmental themes. However, Heritage Impact Assessments set of minimum assessment and reporting criteria has not yet been gazetted. Therefore, your integrated HIA Report must follow the SAHRA's minimum standards for Heritage Impact Assessment Studies and Reporting and the National Heritage Resources Act, 1999.

During the first phase of the assessment (Scoping Phase) the scope of work to be included:

- Conduct a field investigation to provide a description of archaeological artefacts, structures and settlements – if present - in the project area;
- Provide a cultural context and provenience for archaeological artefacts, structures and settlements in the project area and in the surrounding landscape, by means of a detailed desktop background study;

Terms of Reference for the EIR phase:

- Assess the nature and degree of significance of such resources within the area;
- Assess any current and future developmental impacts on the archaeological and historical remains and apply these in a standard impact assessment matrix;
- Propose heritage management measures for heritage mitigation, management and permitting where applicable;
- Proposed general heritage mitigation and management procedures for future development activities in the study area;
- Provide an integrated HIA Report complying to SAHRA's minimum standards for Heritage Impact Assessment Studies and Reporting and the National Heritage Resources Act, 1999.
- Identify and map sensitive and "no-go" areas within and around the proposed Wind, Solar and Industry Facility sites as well as associated infrastructure areas;
- Responding to stakeholder's queries and concerns, as required;
- Provide a statement regarding the potential significance of the identified issues based on the evaluation of the issues/impacts and a reasoned opinion as to whether the proposed project should be authorised; and
- Propose a suitable monitoring programme for the evaluation of the impacts expected during the construction and operational phase of the development, if considered necessary.

The Heritage, Archaeological and Palaeontological integrated impact assessment results will be incorporated by Green-Box Consulting in the EIA application reports. A specific timeline for completion will be determined and be presented to you for your own planning and scheduling purposes.

Yours faithfully

Danie Krynauw
Reg. EAP (EAPASA)

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19 July 2021

Attention: An Kritzinger
Southern Economic Development (SED)
17th Street nr 11
Menlopark
0081
Tel: (012) 335 4126
E-mail: hstrat1@iafrica.com

BY EMAIL

RE: PRIESKA POWER RESERVE INDUSTRIAL HUB PHASE 1 – SOCIO-ECONOMIC IMPACT ASSESSMENT SPECIALIST STUDY, TERMS OF REFERENCE

Green-Box Consulting has been appointed as the Environmental Assessment Practitioner (EAP) for the proposed Prieska Power Reserve Industrial Hub Phase 1 Project.

In terms of the National Environmental Management Act, Act 107 of 1998, and its current 2014 Regulations (as amended), prior environmental authorisation is required for the development. Application procedure to obtain environmental authorisation necessitates a Scoping/EIR process to be followed. To inform this process, Specialist inputs are required. Specialist input applicability is also determined by the National Department of Forestry, Fisheries and Environment, environmental screening tool, a web-based tool, that identify project site sensitivities and therefore specialist assessments to determine sensitivities significance.

A Socio-Economic Specialist Impact Assessment has been identified as a requirement for the Prieska Power Reserve Industrial Hub Project's, EIA application.

Your assistance with this specialist study is appreciated. As the main EAP for the project the following Terms of Reference for the SEI Report is presented to assure the report results are in line with the Authorising Authority requirements:

Note that the National Department of Forestry, Fisheries, and the Environment (DFFE), gazetted a set of Protocols for the assessment and minimum report content requirements of environmental impacts for various environmental themes. However, Social-Economic Impact Assessment set of minimum assessment and reporting criteria has not yet been gazetted. Therefore, the Integrated Environmental Management Information Series, Guideline no. 22, Socio-Economic Impact Assessment developed by the then National Department of Environmental Affairs, must form the basis of your specialist investigation.

During the first phase of the assessment (Scoping Phase) the scope of work to be included:

- A description of the socio-economic environment that may be affected by the project activities, by using baseline data, from existing SA Census Survey Data from Statistics South Africa;
- A description of the potential socio and economic issues associated with the proposed project;

- A description of the approach proposed for assessing the potential significant issues that will need to be addressed by the socio-economic study during the EIR phase.

Terms of Reference for the EIR phase for the SEI report:

- Review all relevant planning and policy frameworks for the project area (Prieska Town, Siyathemba Local Municipality);
- Review information and reports from similar studies, including EIAs undertaken for other infrastructure and solar and wind projects within the vicinity of the Prieska area;
- Provide a detailed description and assessment of all potential social and economic issues associated with the proposed project;
- Describe and obtain an understanding of how the proposed project intervention may impact on settlements and communities within the area of Prieska Town and surrounding farmer communities;
- Identify enhancement and mitigation measures aimed at respectively optimising opportunities and avoiding and or reducing negative impacts;
- Incorporate relevant information from other specialist socio-economic reports/findings to assess possible cumulative impacts;
- Assess and document the significance of social and economic impacts associated with the proposed project;
- Identify and assess all reasonable and feasible alternatives; and
- Provide input for the Environmental Management Programme, including mitigation and monitoring requirements.

The socio-economic impact assessment results will be incorporated by Green-Box Consulting in the different EIA application reports. A specific timeline for completion will be determined and be presented to you for your own planning and scheduling purposes.

Yours faithfully

Danie Krynauw
Reg. EAP (EAPASA)

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12 July 2021

CLJBL Services
199 Roos Street
Meyerspark
PRETORIA
0184

Attention: Mr. Wian Esterhuizen

RE: TERMS OF REFERENCE, PRIESKA POWER RESERVE INDUSTRIAL HUB PHASE 1 – VISUAL IMPACT ASSESSMENT SPECIALIST STUDY,

Green-Box Consulting has been appointed as the Environmental Assessment Practitioner (EAP) for the proposed Prieska Power Reserve Industrial Hub Phase 1 Project.

In terms of the National Environmental Management Act, Act 107 of 1998, and its current 2014 Regulations (as amended), prior environmental authorisation is required for the development. Application procedure to obtain environmental authorisation necessitates a Scoping/EIR process to be followed. To inform this process, Specialist inputs are required. Specialist input applicability is also determined by the National Department of Forestry, Fisheries and THE Environment, environmental screening tool, a web-based tool, that identify project site sensitivities and therefore specialist assessments to determine sensitivities significance.

A Visual Impact Assessment has been identified as a requirement for the Prieska Power Reserve Industrial Hub Project's, EIA application.

Your assistance with this specialist study is appreciated. As the main EAP for the project the following Terms of Reference for your assessment is presented to assure the report results are in line with the Authorising Authority requirements:

Note that the National Department of Forestry, Fisheries, and the Environment (DFFE), gazetted a set of Protocols for the assessment and minimum report content requirements of environmental impacts for various environmental themes. However, Visual Impact Assessment set of minimum assessment and reporting criteria has not yet been gazetted. Therefore, the Guidelines for involving visual and aesthetic Specialist in EIA processes, 2005 developed by Environmental Department of the Western Cape, must form the basis of your specialist investigation.

During the first phase of the assessment (Scoping Phase) the scope of work to be included:

- Undertaking a field study to establish a baseline description of the visual characteristics of the landscape;
- Defining the visual resources and sense of place of the area;
- Identifying and mapping existing sensitive receptors, buffers, important viewpoints and view corridors;

- Identifying and screening of potential visual concerns;
- Ensure that the visual assessment will be in compliance with relevant standards, policies, laws and regulations;
- Providing recommendations for the impact assessment phase. During the second phase of the assessment (Assessment Phase). The scope of work must included:

Terms of Reference for the EIR phase:

- Refining the baseline (Scoping) description of the visual character of the site and zone of visual influence (ZVI);
- Refining the list of identified visual impacts resulting from the proposed installations (with consideration of any public and/or relevant authorities' concerns);
- Evaluating the visual impacts based on standard Visual Impact Assessment (VIA) rating criteria, namely:
    - Quality of landscape – the aesthetic excellence and significance of the visual resources and scenery;
    - Visual absorption capacity – the potential of the landscape to conceal the proposed development;
    - Visibility – including:
    - the ZVI as defined in the scoping report;
    - viewshed analysis – the geographic area from which the project may be visible (view catchment);
    - visibility from selected viewpoints;
    - Visual intrusion (or integrity) – the level of congruence or integration with existing landscape; and
    - Viewer sensitivity – the level of viewer sensitivity as influenced by the type and number of visual receptors.
- Assessing the significance of the visual impacts, through:
    - Severity, extent, duration and probability to determine consequence; and
    - Consequence considered with status (positive or negative impact) and confidence to determine significance.
- Developing mitigation measures to reduce visual impacts and enhance any positive visual benefits; and
- Responding to stakeholder's queries and concerns, as required.

The visual impact assessment results will be incorporated by Green-Box Consulting in the EIA application reports. A specific timeline for completion will be determined and be presented to you for your own planning and scheduling purposes.

Yours faithfully

Danie Krynauw
Reg. EAP (EAPASA)

Appendix F – Other information

1. Presidential Infrastructure Office support letter

THE PRESIDENCY
REPUBLIC OF SOUTH AFRICA

Private Bag X1000, Pretoria, 0001, Tel: 012 300 5200 / Private Bag X 1000, Cape Town, 8000, Tel: 021 464 2100

Ms Meta Mhlarhi
Executive Director
Mahlako A Phahla Investments
345 Rivonia Road
Block A, 1st floor
Rivonia
Johannesburg
2191

10 August 2021

RE: LETTER OF SUPPORT FOR THE PRIESKA POWER RESERVE PROJECT

Infrastructure South Africa (ISA) was established by Cabinet on the 27th of May 2020 under the Executive Authority of the Minister of the Department of Public Works and Infrastructure. Infrastructure South Africa is responsible for developing a credible and robust project pipeline that stimulates aggregate demand, creates jobs, builds confidence in the economy and crowds in private sector funding for major public and private sector infrastructure projects.

South Africa's National Infrastructure Plan is purpose-driven and focused on immediate, medium- and long-term infrastructure implementation and investment across its lifecycle. It is the flywheel to economic growth and recovery that will lead to major job creation and address the essential developmental and economic needs of communities in both our rural and urban areas. ISA's focus sectors are the network industries being energy, water and sanitation, telecommunications and transport. Agriculture and Agro-processing, Human Settlements and Social Infrastructure projects were included as high impact sectors for job creation.

Promoting commercially viable Green Hydrogen projects are a particular focus area for ISA. In this regard, the Energy Technical Working Group has reviewed the Early Business Case submission for your Prieska Power Reserve Project. Separate correspondence has been issued highlighting the issues that need to be resolved in finalising the Early Business Care and preparing the Intermediate Business Case.

We look forward to continuing to develop this project with you and your team.

Kind regards,

Dr Kgosientsho Ramokgopa
Head: Investment and Infrastructure Office, Presidency
Date: 16 August 2021

Presidential Infrastructure Office, Support Letter

END OF REPORT