

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS -

Draft Environmental Impact Report

Prieska Power Reserve Phase 3: Wind Energy Facility & Associated Infrastructure

DAERL Ref.: NC/EIA/11/PIX/SIY/PR14/2022



GREEN-BOX
CONSULTING

Prieska Power Reserve Phase 3: Wind Energy Facility & Associated Infrastructure

Project Details

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PROJECT PROPONENT: PRIESKA POWER RESERVE (PTY) LTD
07 Brebner Rd.
Westdene
Bloemfontein, 9310
Phone: 082 444 2219

ENVIRONMENTAL CONSULTANT: Green-Box Consulting
P.O. Box 37738
Langenhovenpark, 9330
Phone: 082 435 2108
Email: info@green-box.co.za

LEAD EAP: Danie Krynauw (EAPASA – 2019/1348)
Email: danie@green-box.co.za

ENVIRONMENTAL ASSESSMENT TEAM: D. Krynauw
C. Worthmann

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ACRONYMS USED IN THIS REPORT

CA	Competent Authority
CBA	Critical Biodiversity Areas
CBD	Central Business District
DAERL	Department of Agriculture, Environmental Affairs, Rural Development and Land Reform
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
NCPSDF	Northern Cape Provincial Spatial Development Framework
NHRA	National Heritage Resources Agency
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
CA	Competent Authority
CBA	Critical Biodiversity Areas

PROJECT TEAM

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 1 below. This team includes several specialists which have either been involved to date or are planned to provide inputs during the EIA phase.

Table 1: 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 Lamprecht	Eco Focus	Ecological Impact Assessment
Dr. Lloyd Rossouw	Paleo Field Services	Heritage Impact Assessment (Archaeology, Palaeontology and Cultural Landscape)
Mr. Chris van Rooyen	Chris van Rooyen Consulting	Avifauna Impact Assessment
Ms. An Kritzinger	Southern Economic Development	Socio-Economic Impact Assessment
Mr. Wian Esterhuizen	CLJBL Services	Visual 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 19 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.

Mr. Krynauw (the EAP) is supported by the EIA Team as outlined in Table 1.

Report details

Title:	DRAFT ENVIRONMENTAL IMPACT REPORT Prieska Power Reserve Phase 3: Wind Energy Facility & Associated Infrastructure
Purpose of this report:	<p>This Draft Environmental Impact Report forms part of a series of reports and information sources that are being provided during the Environmental Impact Assessment (EIA) process. This report was preceded by a final Scoping Report that was accepted by the Authorising Authority on 21 November 2022.</p> <p>The objective of the environmental impact assessment process is to, through a consultative process—</p> <ul style="list-style-type: none"> (a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context; (b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the development footprint on the approved site as contemplated in the accepted scoping report; (c) identify the location of the development footprint within the approved site as contemplated in the accepted scoping report based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment; (d) determine the— <ul style="list-style-type: none"> (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and (ii) degree to which these impacts— <ul style="list-style-type: none"> (aa) can be reversed; (bb) may cause irreplaceable loss of resources, and (cc) can be avoided, managed or mitigated; (e) identify the most ideal location for the activity within the development footprint of the approved site as contemplated in the accepted scoping report based on the lowest level of environmental sensitivity identified during the assessment; (f) identify, assess, and rank the impacts the activity will impose on the development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity; (g) identify suitable measures to avoid, manage or mitigate identified impacts; and (h) identify residual risks that need to be managed and monitored.
Prepared for:	Prieska Power Reserve (Pty) Ltd
Published by:	Valozone 197 cc t/a Green-Box Consulting
Authors:	Mr. Danie Krynauw (EAP)
Reviewed by:	Miss. Charissa Worthmann (Senior Environmental Scientist)
Green-Box Consulting Documents Ref:	38/P/2020/DK
Date:	21 November 2022

1. INTRODUCTION

PRIESKA POWER RESERVE (PTY) LTD is proposing the establishment of a wind generating facility with its associated infrastructure approximately 10km south-east from Prieska Town, which is located within the Siyathemba Local Municipality in the Northern Cape (refer to Figure 1).

The wind turbine facility is proposed to accommodate several turbines and associated infrastructure such as service roads, and transmission lines. From a regional perspective, this area is considered favourable for the development of wind electricity generating facilities by virtue of the climatic conditions, orographic conditions, relief and the extent of the site and the availability of direct transmission connection to serve a hydrogen manufacturing plant in the industrial zone of Prieska town. The identified site is available for development, and has road access via the R357 provincial road, onto an existing gravel track running towards the mountain where the turbine site is located.









This wind turbine project forms phase 3 of the Prieska Power Reserve, hydrogen conversion and ammonia production Project. The production of hydrogen is reliant on renewable energy sources such as solar and wind for energy production. Priska Power Reserve is exploring both sources. The nature and extent of the proposed wind energy generating facility, as well as potential environmental impacts associated with the construction, operation and decommissioning phases are explored in more detail in this Draft EIA Report.

1.1 Summary of the proposed development

The Prieska Power Reserve Wind Energy Facility & Associated Infrastructure project is proposed to be established on various portions of land covering an approximate 1007,69 hectare (See Figure 1 & 2, 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 <50ha can be appropriately placed within the boundaries of the broader site (1007,69 ha) while aiming to avoid any environmental sensitivities identified throughout the EIA process.

In the first phase of the wind turbine project, a total of only 21 turbines will be erected, delivering 138,6 MW AC. The second phase will bring the erection of another 12 turbines and an additional 85,8 MW AC. The actual footprint of a single turbine is 120m x 80m (0,96ha), they will be spaced at least 400m from each other. The following associated infrastructure will be included:

-  33 Turbines;
-  33kV connector lines;
-  132 kV transmission line;
-  Security fencing;
-  Laydown area (1ha);
-  Roads;
-  Combiner Stations; and
-  Substation and water lines.

The aim of this wind turbine facility is to generate electricity during the night to feed into the hydrogen industrial complex, allowing electricity generation from renewable resources 24hours a day. This complex will produce green hydrogen and ammonia production to feed zero emission green industries.

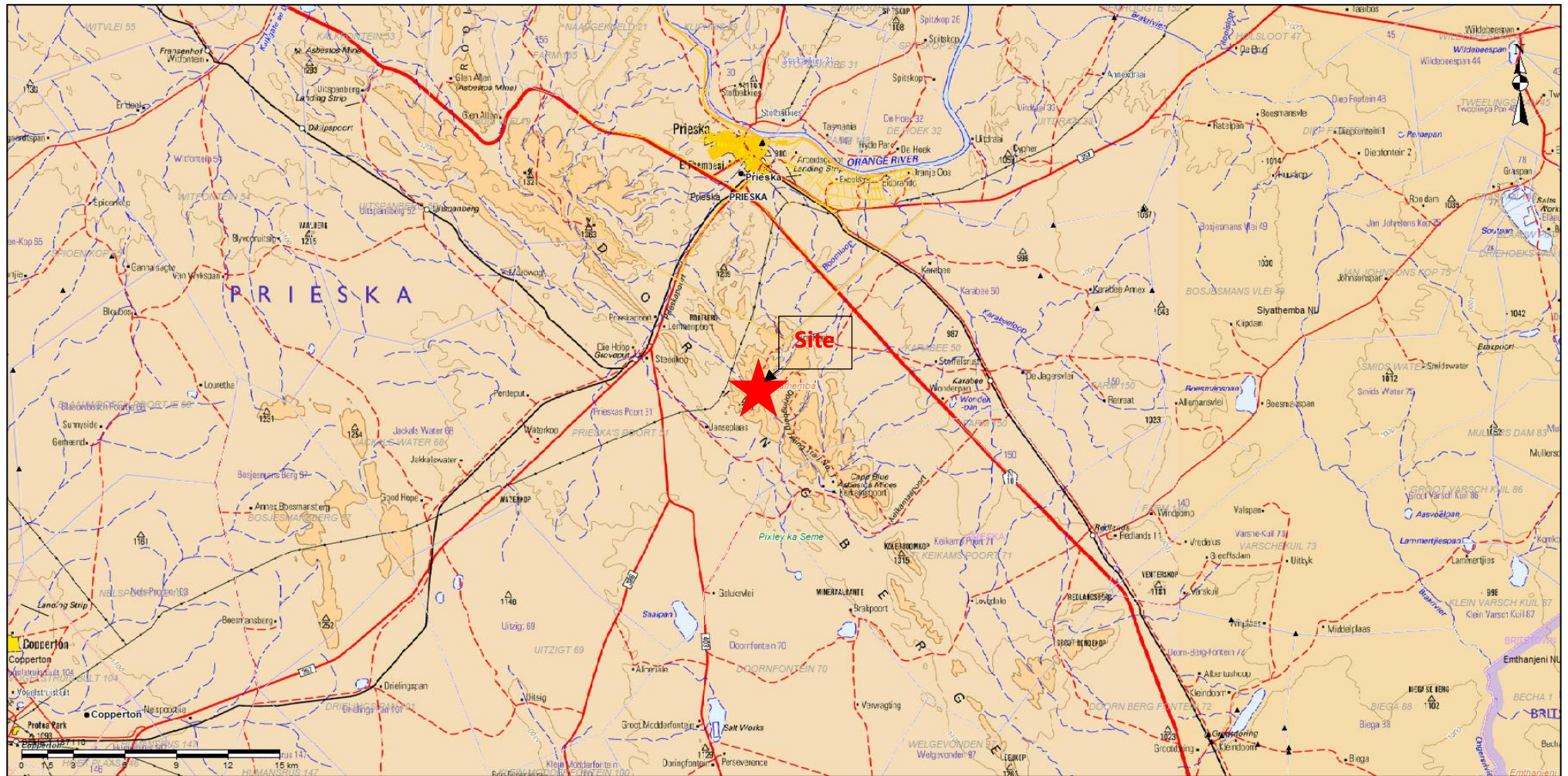


Figure 1: Location Map for the PRIESKA POWER RESERVE (PTY) LTD Wind Turbine Facility (Planet GIS, 2021)

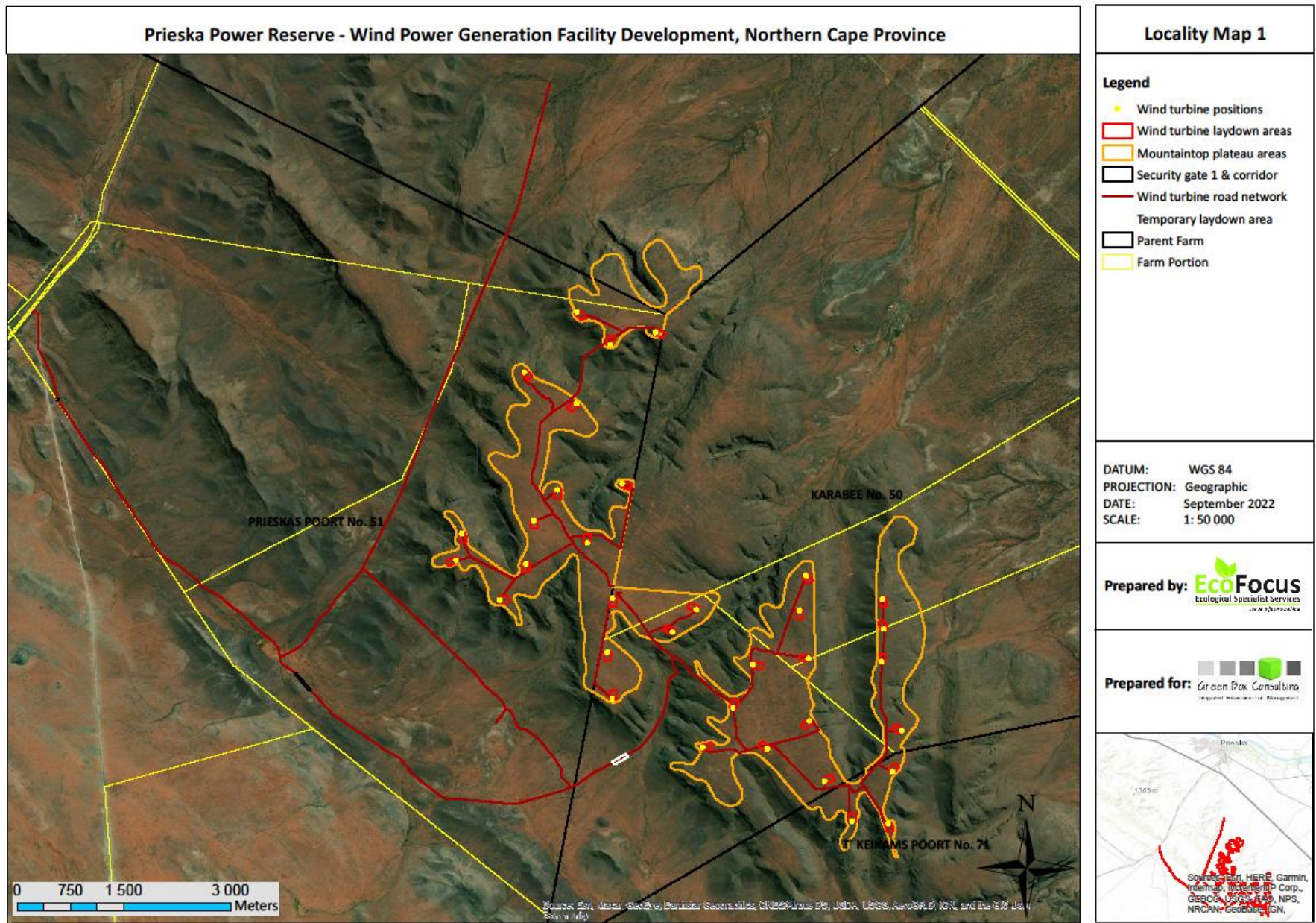


Figure 2: Aerial image for the PRIESKA POWER RESERVE (PTY) LTD Wind Turbine Facility (EcoFocus, 2021)

The overarching objective for the wind turbine facility is to maximise electricity production for the proposed ammonia and hydrogen manufacturing industry, one of the phases of the Prieska Power Reserve Project. Electricity production from the wind turbines will only be during night-time to allow the hydrogen manufacturing plant operational 24hours a day. This can be achieved through exposure to the wind resource, while minimising infrastructure, operational and maintenance costs, as well as social and environmental impacts. To meet these objectives local level environmental and planning issues have been assessed through site-specific studies to delineate areas of sensitivity within the broader site, this informed the design of the facility.

The scope of the proposed Prieska Power Reserve Wind Turbine Area, 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 Rationale for the proposed Prieska Power Reserve Phase 3: Wind Turbines & Associated Infrastructure

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 Northern Cape Provincial Spatial Development Framework (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 Prieska Power Reserve Project is proposed, is a similar case. Hence the DAERL 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: The electricity produced will be used to power the production of hydrogen and ammonia at the Prieska Hydrogen industrial facility. Hydrogen is produced by electrolysis, but another process will combine hydrogen and nitrogen to produce ammonia. While the electrolysis could be interrupted or shutdown relatively easy, the production of ammonia requires a long period of shutdown and start-up. That is why the production of electricity is required 24 hours per day and hence the importance of turbine power production at night.

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 R357 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 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 Phase 3: Wind Turbines & Associated Infrastructure. PRIESKA POWER RESERVE (PTY) LTD has appointed Green-Box Consulting to undertake the EIA Process 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 Wind Facility requires authorisation from the Provincial Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (DAERL) 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 224 MW Prieska Power Reserve Phase 3: Wind Turbines & Associated Infrastructure Project include the following (see **Table 2**):

Table 2: Identified listed activities triggered by the Prieska Power Reserve Phase 3: Wind Turbines & Associated Infrastructure 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 33kV connector lines and a 132kV distribution line to a proposed hydrogen Plant.
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 edge of a watercourse.	The proposed wind facility and infrastructure will entail the construction of building infrastructure and structures (such as the turbine erecting areas, 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 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 have been confirmed by an Ecological Impact Assessment, see details in this report.
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 installation of linear infrastructure such as electricity lines and possible water lines 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 ecological impact assessment study undertaken for the site, drainage lines have been identified to occur on 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 portions of land earmarked for the wind facility has an agricultural zoning. The proposed wind facility which is a commercial/industrial development, will have an estimated footprint of roughly 31,68 ha in total for the wind turbines and 1 ha additionally for the two electrical combiners. A temporary 1ha sized laydown area will also be cleared. Thus, equating to 33.68 hectares.

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 224 MW wind generating facility.
Activity 15	The clearance of an area of 20 hectares or more of indigenous vegetation.	The proposed wind facility footprint will cover an estimated 33.68 ha footprint area. Indigenous vegetation occurrence on site have been surveyed through an Ecological Impact Assessment Study, and is included in this Draft EIA Report.
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. (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.	Upgrading of existing gravel roads is proposed to gain access to the individual turbine locations, some of these access roads falls within a CBA2 area.
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.	Upgrading of existing gravel roads is proposed to gain access to the individual turbine locations, some of these access roads falls within a CBA2 area. It is anticipated that more than 300 m ² of vegetation will be removed to upgrade these roads.
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 10m ² within a watercourse or within 32 meters from a watercourse are required especially linear infrastructure such as electricity lines, and road upgrades. Various drainage lines have been identified.

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:

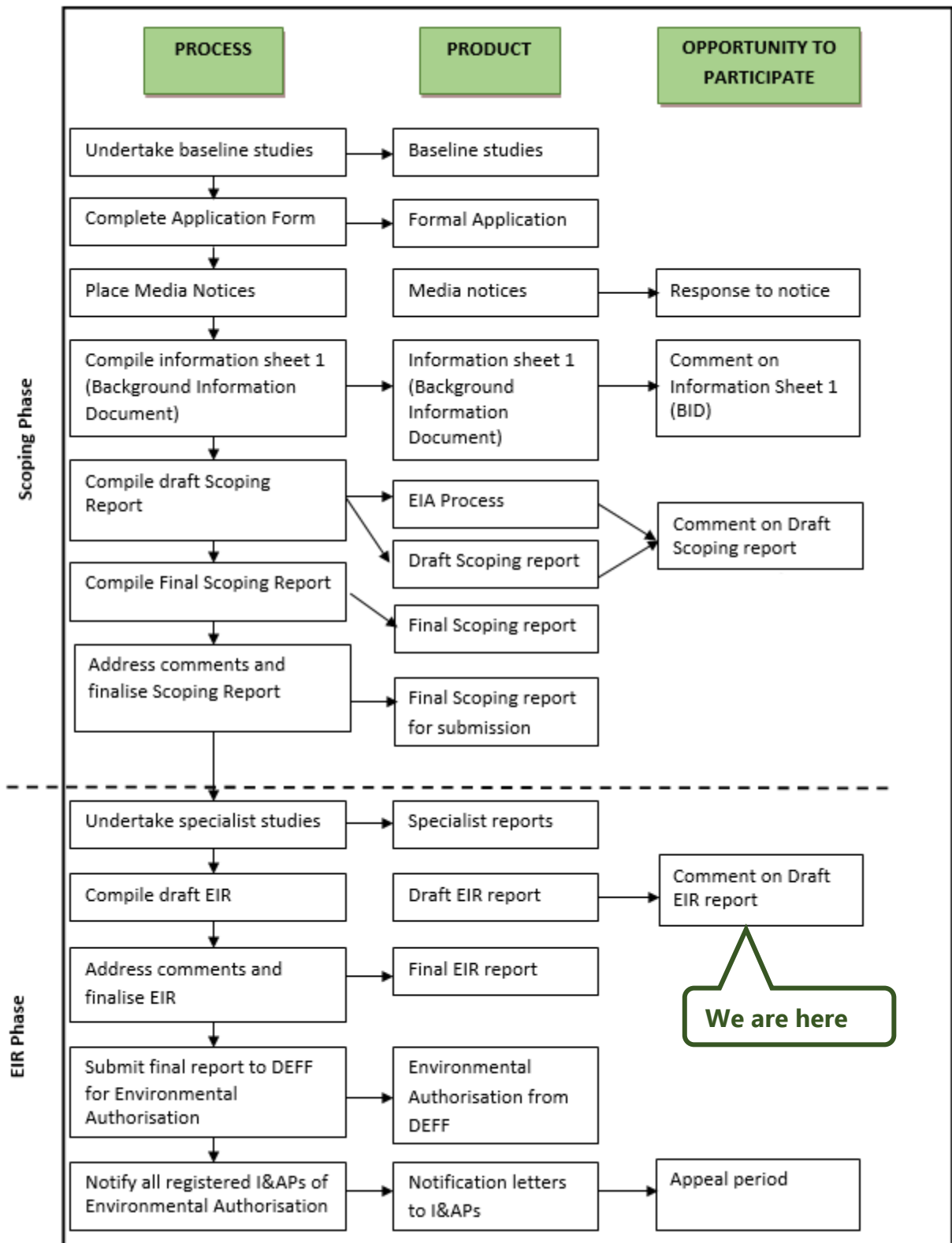


Figure 3: EIA Process Flow Chart

1.3.1 EIA Process

The primary objective of this EIR is to present stakeholders, Interested and Affected Parties (I&APs) and the Competent Authority, with an overview of the predicted impacts and associated management actions required to avoid or mitigate the negative impacts; or to enhance the benefits of the proposed project. In broad terms, the EIA Regulations (GN R326) stipulates that the EIA Process must be undertaken in line with the approved Plan of Study for the EIA and must include a description of the potential environmental impacts, mitigation and closure outcomes, as well as the residual risks of the proposed activity.

The EIR was preceded by a comprehensive Scoping Phase. During the Scoping Phase, the Draft Scoping Report was made available to Interested and Affected Parties (I&APs) and stakeholders for a 30-day review period from **15 September to 15 October 2022**. Comments received during the 30-day review period were incorporated into the Final Scoping Report (where required), and the finalised Scoping Report was submitted to DAERL the Authorising Authority for acceptance. The Final Scoping Report was accepted on **21 November 2022**, constituting the end of the Scoping phase and the commencement of the EIA phase.

Regulation 23 of the EIA Regulations (GN R326) refers to the submission and consideration of EIRs and Environmental Management Programmes (EMPrs), and states that:

- (1) *The applicant must within 106 days of the acceptance of the scoping report submit to the competent authority –*
 - (a) *An environmental impact assessment report inclusive of any specialist reports, and an EMPr, which must have been subjected to a public participation process of at least 30 days and which reflects the incorporation of comments received, including any comments of the competent authority.*
- (3) *An environmental impact assessment report must contain all information set out in Appendix 3 to these Regulations or comply with a protocol or minimum information requirements relevant to the application as identified and gazetted by the Minister in a government notice and, where the application is for an environmental authorisation for prospecting, exploration, extraction of a mineral or petroleum resource, including primary processing or activities directly related thereto, the environmental impact assessment report must contain attachments that address the requirements as determined in the regulations, pertaining to the financial provision for the rehabilitation, closure and post closure of prospecting, exploration, mining or production operations, made in terms of the Act.*

This Draft EIR is being released to stakeholders for a 30-day review period starting from **22 November 2022 to 14 December 2022 and again from 06 to 12 January 2023 (note that no public participation will be conducted between 15 December 2023 to 05 January 2023 as per GN R 326 Section 3(2))**. In accordance with the requirements of Regulations 43 and 44 (GN R326) all I&APs on the current database for this EIA (refer to **Appendix F**) have been informed in writing of the release of the EIA Report for a 30-day comment period. Comments received during the 30-day review period will be included in a finalised EIA Report, to be submitted to the Authorising Authority for decision-making.

A crucial objective of the draft EIR is to satisfy the requirements of Appendix 3 of the EIA Regulations (as noted in Regulation 23(3) of the GN R326). This section regulates and prescribes the content of the EIR and specifies the type of supporting information that must accompany the submission of the EIR to the Competent Authority. An overview of where the requirements of Appendix 3 of the EIA Regulations (GN R326) are addressed in this EIR is presented in Table 3.

Table 3: Requirements for an EIR in terms of Appendix 3 of the 2014 NEMA EIA Regulations

EIA Regulation	Requirements for an EIR in terms of Appendix 3 of the 2014 NEMA EIA Regulations (GN R326)	Location in this EIR
Appendix 3 – 3.(1)(a)	Details of – (iii) The EAP who prepared the report, and (iv) The expertise of the EAP, including a curriculum vitae.	Chapter 1
Appendix 3 –	The location of the activity, including –	Chapter 2

EIA Regulation	Requirements for an EIR in terms of Appendix 3 of the 2014 NEMA EIA Regulations (GN R326)	Location in this EIR
3.(1)(b)	<ul style="list-style-type: none"> (i) The 21-digit Surveyor General code of each cadastral land parcel, (ii) Where available, the physical address and farm name, and (iii) Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties. 	
Appendix 3 – 3.(1)(c)	<p>A plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is –</p> <ul style="list-style-type: none"> (i) A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken, or (ii) On land where the property has not been defined, the coordinates within which the activity is to be undertaken. 	Chapter 2
Appendix 3 – 3.(1)(d)	<p>A description of the scope of the proposed activity, including –</p> <ul style="list-style-type: none"> (i) All listed and specified activities triggered and being applied for, and (ii) A description of the associated structures and infrastructure related to the development. 	Chapter 2
Appendix 3 – 3.(1)(e)	<p>A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context.</p>	Chapter 3
Appendix 3 – 3.(1)(f)	<p>A motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred development footprint within the approved site as contemplated in the accepted scoping report.</p>	Chapter 1
Appendix 3 – 3.(1)(g)	<p>A motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report.</p>	Chapter 2
Appendix 3 – 3.(1)(h)	<p>A full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report, including:</p> <ul style="list-style-type: none"> (i) Details of the development footprint alternatives considered, (ii) Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs, (iii) A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them, (iv) The environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects, (v) The impacts and risks identified, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts – <ul style="list-style-type: none"> (aa) can be reversed, (bb) may cause irreplaceable loss of resources, and (cc) can be avoided, managed or mitigated, (vi) The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks, (vii) Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community 	Chapter 1 Chapter 2 Chapter 7

EIA Regulation	Requirements for an EIR in terms of Appendix 3 of the 2014 NEMA EIA Regulations (GN R326)	Location in this EIR
	<p>that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects,</p> <p>(viii) The possible mitigation measures that could be applied and level of residual risk,</p> <p>(ix) If no alternative development footprints for the activity were investigated, the motivation for not considering such, and</p> <p>(x) A concluding statement indicating the location of the preferred alternative development footprint within the approved site as contemplated in the accepted scoping report.</p>	
Appendix 3 – 3.(1)(i)	<p>A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity, including –</p> <p>(i) A description of all environmental issues and risks that were identified during the environmental impact assessment process, and</p> <p>(ii) An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.</p>	Chapter 7
Appendix 3 – 3.(1)(j)	<p>An assessment of each identified potentially significant impact and risk, including –</p> <p>(i) Cumulative impacts,</p> <p>(ii) The nature, significance and consequences of the impact and risk,</p> <p>(iii) The extent and duration of the impact and risk,</p> <p>(iv) The probability of the impact and risk occurring,</p> <p>(v) The degree to which the impact and risk can be reversed;</p> <p>(vi) The degree to which the impact and risk may cause irreplaceable loss of resources, and</p> <p>(vii) The degree to which the impact and risk can be mitigated.</p>	Chapter 7
Appendix 3 – 3.(1)(k)	<p>Where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report.</p>	Chapters 5 & 6
Appendix 3 – 3.(1)(l)	<p>An environmental impact statement which contains –</p> <p>(i) A summary of the key findings of the environmental impact assessment,</p> <p>(ii) A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint on the approved site as contemplated in the accepted scoping report indicating any areas that should be avoided, including buffers, and</p> <p>(iii) A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.</p>	Chapter 10
Appendix 3 – 3.(1)(m)	<p>Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.</p>	Chapter 7 Part B

EIA Regulation	Requirements for an EIR in terms of Appendix 3 of the 2014 NEMA EIA Regulations (GN R326)	Location in this EIR
Appendix 3 – 3.1(n)	The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment.	Chapter 5
Appendix 3 – 3.1(o)	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation.	Chapter 10
Appendix 3 – 3.1(p)	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed.	Chapter 8
Appendix 3 – 3.1(q)	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.	Chapter 10
Appendix 3 – 3.1(r)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded, and the post construction monitoring requirements finalised.	N/A
Appendix 3 – 3.1(s)	An undertaking under oath or affirmation by the EAP in relation to – (i) The correctness of the information provided in the reports, (ii) The inclusion of comments and inputs from stakeholders and I&APs, (iii) The inclusion of inputs and recommendations from the specialist reports where relevant, and (iv) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties.	Chapter 10
Appendix 3 – 3.1(t)	Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts.	N/A
Appendix 3 – 3.1(u)	An indication of any deviation from the approved scoping report, including the plan of study, including – (i) Any deviation from the methodology used in determining the significance of potential environmental impacts and risks, and (ii) A motivation for the deviation.	N/A
Appendix 3 – 3.1(v)	Any specific information that may be required by the competent authority.	N/A
Appendix 3 – 3.1(w)	Any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/A
Appendix 3 – 3.2)	Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to an environmental impact assessment report the requirements as indicated in such notice will apply.	N/A

2 ACTIVITY DESCRIPTION

5.1 2.1 Location of the activity and property description

This section provides an overview of the project design and an overview of the site and technology selection process for the Prieska Power Reserve Phase 3: Wind Energy Facility & Associated Infrastructure Project as provided by PRIESKA POWER RESERVE (PTY) LTD.

The purpose of this section is to present sufficient project information to inform the EIA Process in terms of design parameters applicable to the project. As noted previously, the proposed project will take place on a portion of Portions 2 & 11 of the Farm Prieska's Poort No. 51 (SG 21 Digit Codes: C0600000000005100002 & C06000000000005100011); Portions 3, 4, 8 & 9 of the Farm Karabee No. 50 (SG 21 Digit Codes: C0600000000005000003, C0600000000005000004, C0600000000005000008 & C0600000000005000009); and Portion 12 of the Farm T'Keikams Poort No. 71 (SG 21 Digit Code: C0600000000007100012) all situated near Prieska Town in the Northern Cape (Figure 1). General site information is shown in Table 4.

Table 4: General site information

Description of affected farm portion	Portion 2 of the Farm Prieska's Poort 51 Portion 11 of the Farm Prieska's Poort 51 Portion 3 of the Farm Karabee 50 Portion 4 of the Farm Karabee 50 Portion 8 of the Farm Karabee 50 Portion 9 of the Farm Karabee 50 Portion 12 of the Farm T'Keikams Poort 71
21 Digit Surveyor General codes	C0600000000005100002 C0600000000005100011 C0600000000005000003 C0600000000005000004 C0600000000005000008 C0600000000005000009 C0600000000007100012
Photographs of the site	Refer to the Plates
Type of technology	Wind turbine facility, with transmission line and access road
Structure Height	Turbine dominant height is 118m, with rotor height 200m
Surface area to be covered	0.96ha per turbine, 33 turbines total of 31.68ha, associated infrastructure is linear in nature, e.g., Service roads and access roads will have different quality foundations and surface finish, but the width in all cases will be 7m wide. The main road will come from the R357 linking Prieska with Copperton. Two service roads will link up with the service road along the Cuprum-Burchell transmission line. Pyloned transmission lines will have a service road as well. A 132 kV transmission line will lead from the turbine area to run parallel to the Cuprum-Burchell line.

	A temporary 1ha laydown area is also included, with another two in total 1ha Combiner Stations area.
Structure orientation	The turbines will be spaced at least 400meters from each other. However, when behind each other with the grain of the dominant wind direction, they need to be as far as 800 m from each other to minimise negative effects (turbulence) on wind efficiency.
Temporary Laydown area	Inside assessment area with a footprint size of, 1ha.
Combiners	2 x Combiners areas, the northern site is 0.57ha and southern site is 0.54ha in extent.
Security corridor	Security corridor area of 0.6ha.
Generation capacity	224MW

2.2 Activity description

The proposed development will trigger the following activities:

Table 5: Identified listed activities triggered by the Prieska Power Reserve Phase 3: Wind Turbines & Associated Infrastructure 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 33kV connector lines and a 132kV distribution line to a proposed hydrogen Plant.
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 edge of a watercourse.	The proposed wind facility and infrastructure will entail the construction of building infrastructure and structures (such as the turbine erecting areas, 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 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 have been confirmed by an Ecological Impact Assessment, see details in this report.
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	The proposed installation of linear infrastructure such as electricity lines and possible water lines will entail the excavation, removal and moving of more than 10 m ³ of

	rock of more than 10 cubic metres from a watercourse	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 ecological impact assessment study undertaken for the site, drainage lines have been identified to occur on 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 portions of land earmarked for the wind facility has an agricultural zoning. The proposed wind facility which is a commercial/industrial development, will have an estimated footprint of roughly 31,68 ha in total for the wind turbines and 1 ha additionally for the two electrical combiners. A temporary 1ha sized laydown area will also be cleared. Thus, equating to 33.68 hectares.
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 224 MW wind generating facility.
Activity 15	The clearance of an area of 20 hectares or more of indigenous vegetation.	The proposed wind facility footprint will cover an estimated 33.68 ha footprint area. Indigenous vegetation occurrence on site have been surveyed through an Ecological Impact Assessment Study, and is included in this Draft EIA Report.
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. (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.	Upgrading of existing gravel roads is proposed to gain access to the individual turbine locations, some of these access roads falls within a CBA2 area.
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.	Upgrading of existing gravel roads is proposed to gain access to the individual turbine locations, some of these access roads falls within a CBA2 area. It is anticipated that more than 300 m ² of vegetation will be removed to upgrade these roads.
Activity 14 (ii)(a)(g)(ii)(ff)	The development of—	Construction of structures larger than 10m ² within a watercourse or within 32 meters from a watercourse are required especially

	<p>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.</p>	<p>linear infrastructure such as electricity lines, and road upgrades. Various drainage lines have been identified.</p>
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The potentially most significant impacts will occur during the construction phase of the development, which will include the following activities:

- Site clearing and preparation: Certain areas of the site will need to be cleared of vegetation and some areas may need to be levelled.
- Civil works to be conducted:
 - Terrain levelling if necessary– Levelling will be minimal as the potential site chosen is relatively flat.
 - Laying foundation- The structures will be connected to the ground through cement pillars, cement slabs or metal screws. The exact method will depend on the detailed geotechnical analysis.
 - Construction and upgrading of access and inside roads/paths – existing paths will be used where reasonably possible. Additionally, the turning circle for trucks will also be taken into consideration.
 - Trenching – all Direct Current (DC) and Alternating Current (AC) wiring within the PV plant will be buried underground. Trenches will have a river sand base, space for pipes, backfill of sifted soil and soft sand and concrete layer where vehicles will pass.
 - Construction of a 132kV transmission line, that will run parallel to the existing Cuprum-Burchell Eskom line.

2.3 Key Components of the Proposed Wind Energy 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 production capacity of 224 MW AC of electricity. The preferred project site includes approximately 1007,69 hectare of land with a development footprint total of approximately 33.68 hectares.

The two main components of the project will consist of the wind generation field and associated infrastructure. The technical components forming part of the facility are discussed below.

The wind facility will consist of the following components:

- 🌿 Thirty-three (33) separate wind turbines and associated laydown areas of approximately 80 m x 125 m (0.96 ha) in size each;
- 🌿 Two electrical combiners;
- 🌿 Connection 33kV powerlines to each turbine;
- 🌿 132kV line that will run parallel to the existing Cuprum-Burchell line;
- 🌿 Access roads;
- 🌿 Security corridor;
- 🌿 Temporary Laydown area, and
- 🌿 Perimeter fencing and internal entrance security.

2.3.1 Technical Aspects

The conversion of the kinetic energy carried by wind to usable electrical energy generates a pressure difference creating lift and drag (figure 5). This happens through the aerodynamic design of wind turbine blades allow the wind to move at different speeds on each side of the blade. When the lift force happens, torque and rotation is generated. At this point, kinetic energy now becomes rotational energy. The axis of the turbine which has been consistently rotating is connected to a specialized generator which turns it into electric energy. This process is known as the *electromechanical conversion principle*. Strategically fitted converters will then match the voltage and frequency aspects of the generated energy into that which matches the design grid. This will then aim to achieve the of 224MW design capacity.

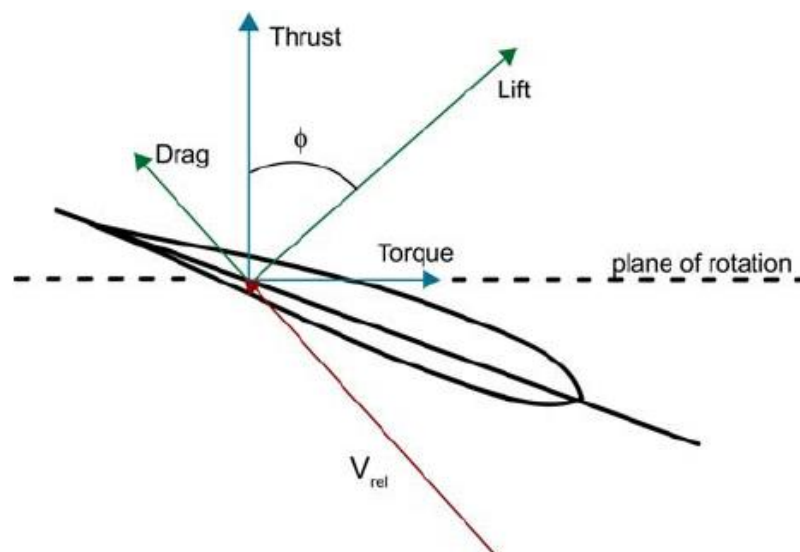


Figure 5: Overview of the forces acting on the wind turbine blade (Maria & Jacobson, 2007)

The most important parts of wind generating systems are way in which the blades are designed to catch the wind and rotate where they then disperse air pressure (figure 6).

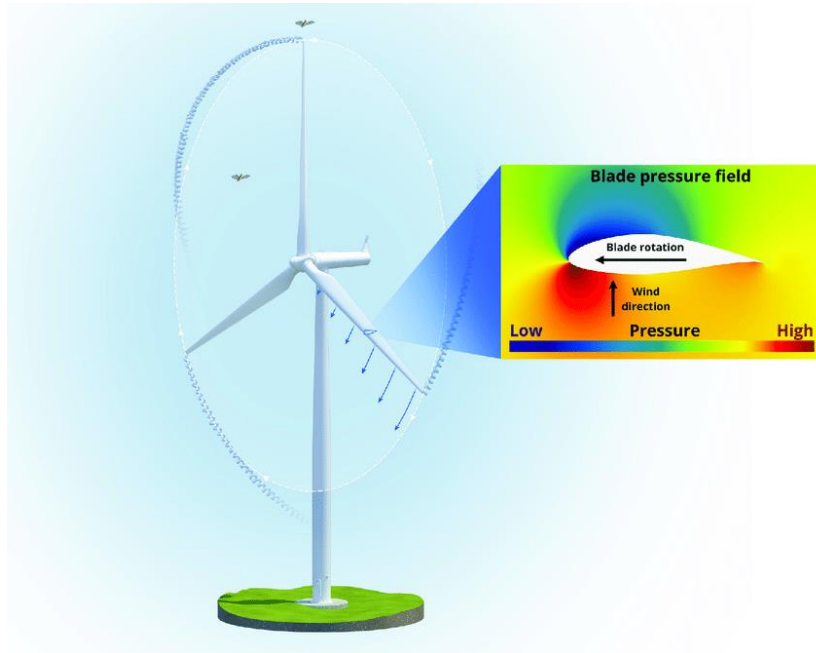


Figure 6: Basic diagram depicting air pressure dispersion in a rotating wind turbine (Researchgate, 2020)

✓ *Wind Turbine Components*

A wind turbine is made up of the following components:

- (i) Towers generally built out of concrete and assembled on site.
- (ii) The blades which are made of composite material
- (iii) The hub (or the nose) which mechanically connects the three blades and helps control the pitch and stop the blades when conditions get dangerous
- (iv) A nacelle which houses all the equipment that makes the functioning of a wind turbine possible. This includes components such as a gearbox, generator, converter, transformer, and control equipment.
- (v) 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
- (vi) A balance of system hardware.

2.4 Overview of Project Development Cycle

2.4.1 Wind Generation Facility Construction

To construct the proposed wind turbine 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, several 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. The geotechnical examination will include surface and subsurface exploration, soil sampling and laboratory analysis.
- Site survey – was done for the finalisation of the design layout of the wind turbines, and other infrastructure. The micro-siting footprint considered all environmental sensitivity identified during the specialist investigations.

The construction of the plant is expected to take up to 36 months with a project lifespan of 30 years or more. Approximately 223 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 wind generation facility include the following:

- i. Site establishment (this will also include a temporary lay-down area measuring 80mx125m, 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. Turbine assembly;
- v. Line construction and line connection;
- vi. Electrical site works; and
- vii. 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 wind generation facility site.

Establishment of a laydown area 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 wind generation infrastructure and the general placement/storage of construction equipment.

Establishment of ancillary infrastructure –

Ancillary infrastructure includes a 132kV power line feeding into the Hydrogen Plant. 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.

2.4.2 Wind Turbine Facility Operation

A wind generation facility needs low but regular maintenance, and this will consist of scheduled proactive maintenance which is planned and aimed at preventing faults from occurring, as well as to keep the facility operating at an optimum level. The following activities will be undertaken:

- i. Blade and turbine servicing;
- ii. Checking nacelle components and module connections;
- iii. Inspection and servicing of electrical components and hardware;
- iv. Inspecting mechanical integrity of relevant structures;
- v. Vegetation control; and
- vi. Routing balance of facility servicing.

2.4.3 Wind Turbine Facility Decommissioning

The wind turbine facility will be decommissioned at the end of the 30 years. The following activities will be carried out:

- i. Removal of wind turbine 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 landowner 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 blades and the electrical wiring will be recycled accordingly.

2.5 Layout Description

The layout plan has followed the limitations of the site and aspects such as environmentally sensitive areas, roads, fencing and servitudes on site were considered.

The total surface area proposed for layout options include turbine structures spaced to receive optimal wind, access and maintenance roads and associated infrastructure. A final layout plan is included as Appendix D under Layout Plans in this report. Table 6 below provides detailed information regarding the layout for the proposed facility as per DAERL requirements.

Table 6: Technical details of the proposed facility

Component	Description / Dimensions
Hight of turbines	Turbine dominant height is 118m, with rotor height 200m
Area of turbines	1007,69 ha (footprint: 0.96ha per turbine, 33 turbines total of 31.68ha for the turbines)
Temporary Laydown area	Inside assessment area with a footprint size of, 1ha.
Combiners	2 x Combiners areas, the northern site is 0.57ha and southern site is 0.54ha in extent.
Security corridor	Security corridor area of 0.6ha.
Width of internal roads	7m
Height of fencing	2.5m
Electricity lines	33kV lines connecting each turbine. A 132 kV transmission line will lead from the turbine area to run parallel to the Cuprum-Burchell line.

Figure 7 provide an illustration of the turbine positioning. Table 7 and figure 8, provide and illustrate the corner coordinate points for the proposed development site as well as start, middle and end point coordinates for linear activities. A 132 kV transmission line will lead from the substation for approximately 420 m outside the security fence where it will run northwards and parallel to the existing 132 kV Burchell- Cuprum Eskom line. However, the transmission line will not, as do the Eskom line, pass through the Burchell substation. This new line will be 21 m from the middle of the Eskom pylon row, hence the servitude for the new line will overlap to that extent with the existing servitude but will add only 21 m to the width of the existing servitude. Just about 220m ahead of the substation, it will swerve northwest to the Prieska Industrial area. This section forms part of an already approved authorisation, Phase 2 Prieska Power Reserve Industrial Complex Project.

Table 7: Wind Turbine Coordinates

Coordinates		
Area 1 Northern area		
Turbine no.	Longitude	Latitude
B01	22°45'17,38"E, 29°45'59,49"S	
B02	22°45'32,52"E, 29°46'14,30"S	
C01	22°45'53,06"E, 29°46'08,60"S	
B03	22°44'53,26"E, 29°46'26,67"S	
B05	22°45'17,12"E, 29°46'41,00"S	
B08	22°45'08,49"E, 29°47'20,10"S	
C10	22°45'38,02"E, 29°47'17,38"S	
B07	22°44'24,99"E, 29°47'39,95"S	
B10	22°44'57,56"E, 29°47'34,05"S	
B04	22°45'22,14"E, 29°47'44,14"S	
B09	22°44'22,35"E, 29°47'52,07"S	
B11	22°44'54,18"E, 29°47'53,58"S	
B12	22°44'42,14"E, 29°48'10,07"S	
B13	22°45'33,56"E, 29°48'09,30"S	
B14	22°46'11,82"E, 29°48'14,47"S	
B15	22°46'00,92"E, 29°48'24,62"S	
B16	22°45'31,19"E, 29°48'33,69"S	
B18	22°45'33,42"E, 29°48'54,78"S	
B19	22°46'33,60"E, 29°48'58,61"S	
B20	22°47'03,26"E, 29°49'05,00"S	
B21	22°46'43,83"E, 29°49'17,59"S	
Area 2 Southern area		
D01	- 22°47'01,57"E, 29°47'58,91"S	
D02	- 22°46'58,64"E, 29°48'14,72"S	
D03	- 22°47'02,76"E, 29°48'36,59"S	
B17	- 22°46'37,40"E, 29°48'39,30"S	
B23	- 22°47'10,07"E, 29°49'32,17"S	
F03	- 22°47'22,54"E, 29°49'50,20"S	
F02	- 22°47'38,98"E, 29°49'51,41"S	
F01	- 22°47'40,92"E, 29°49'28,04"S	
D06	- 22°47'45,26"E, 29°49'09,32"S	
D05	- 22°47'36,03"E, 29°48'37,99"S	
D04	- 22°47'37,06"E, 29°48'23,24"S	
D07	- 22°47'36,25"E, 29°48'09,74"S	

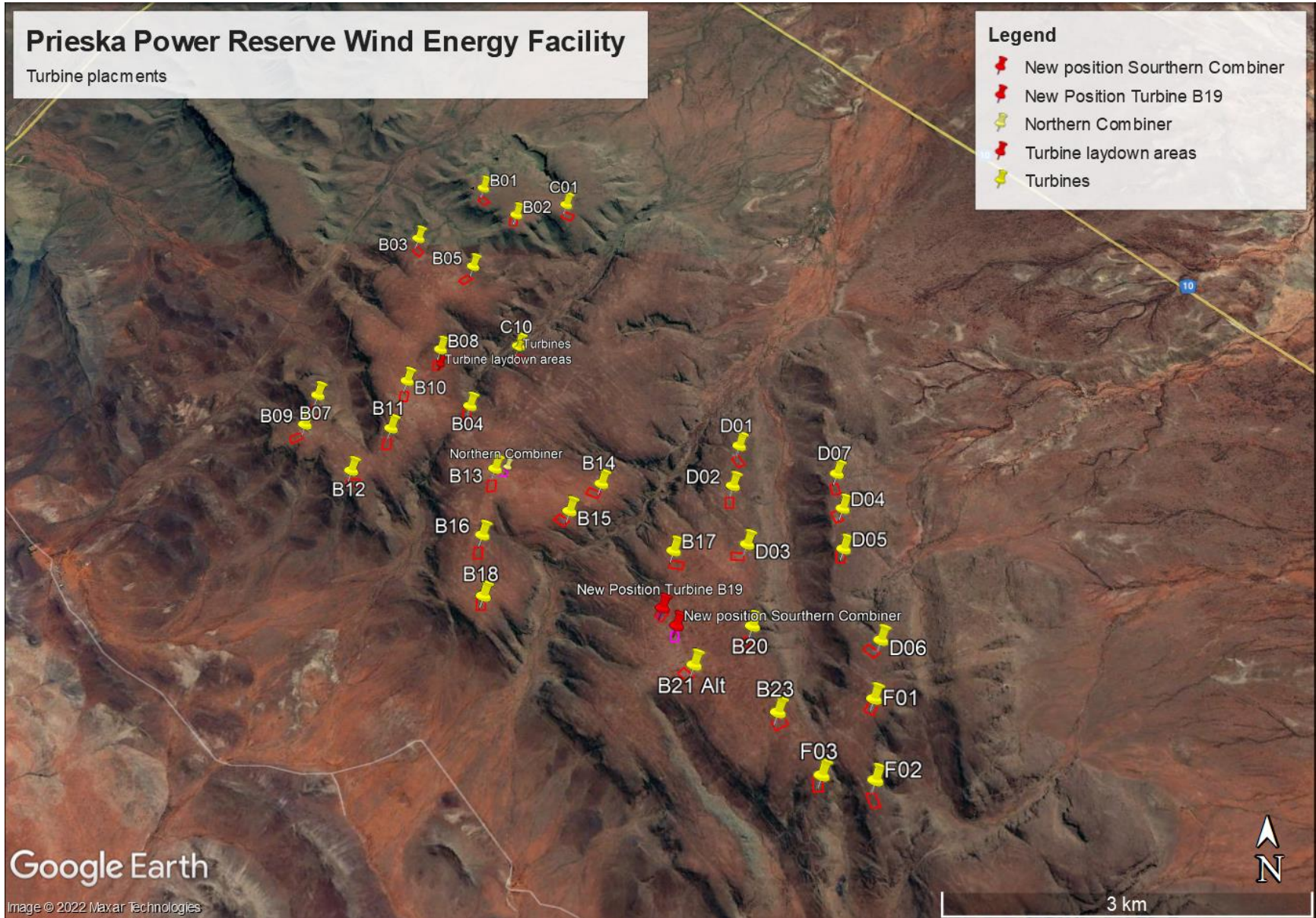


Figure 7: Turbine positioning

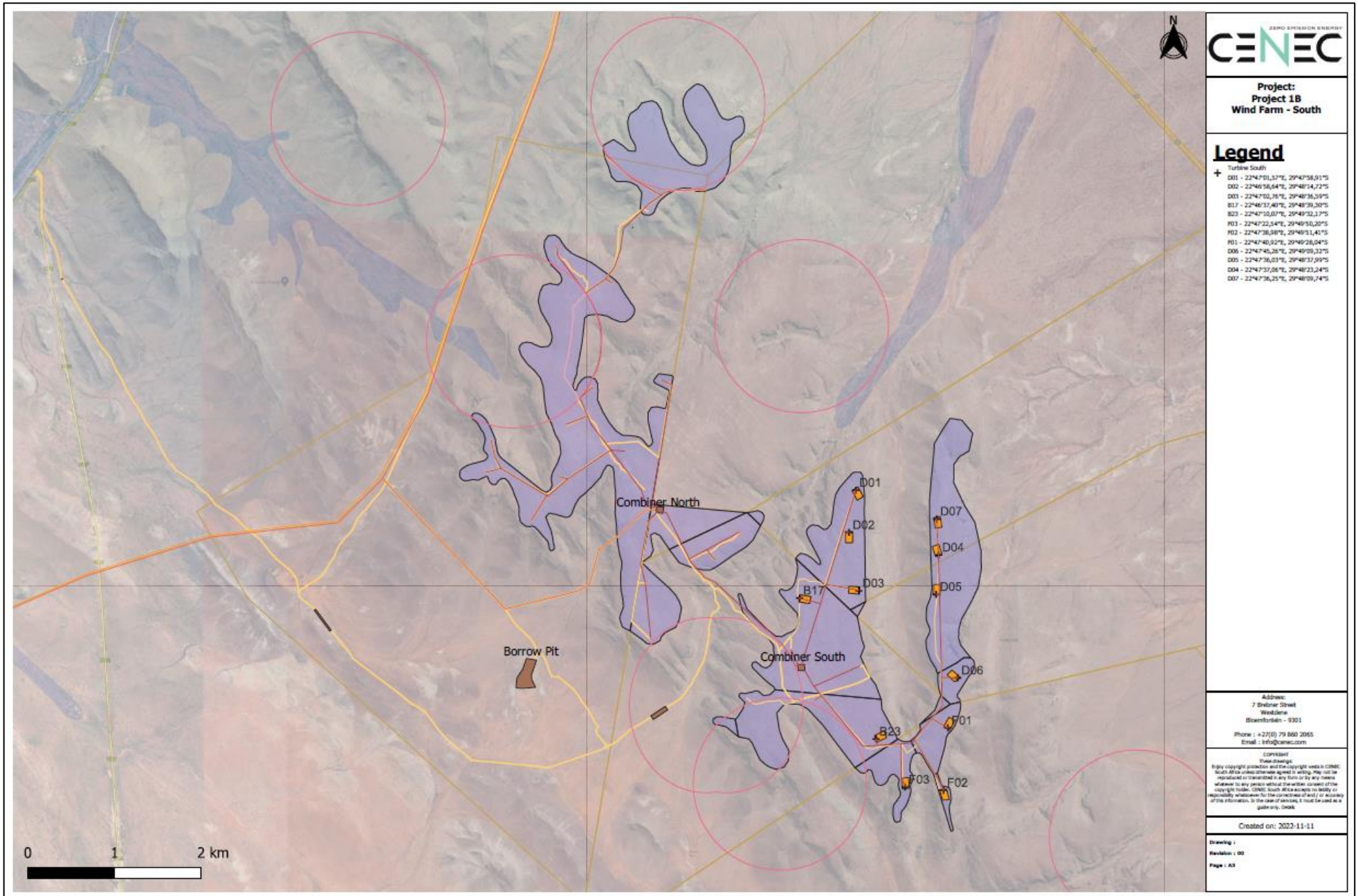


Figure 8: Coordinate points of the South Wind Turbines (Project 1B)

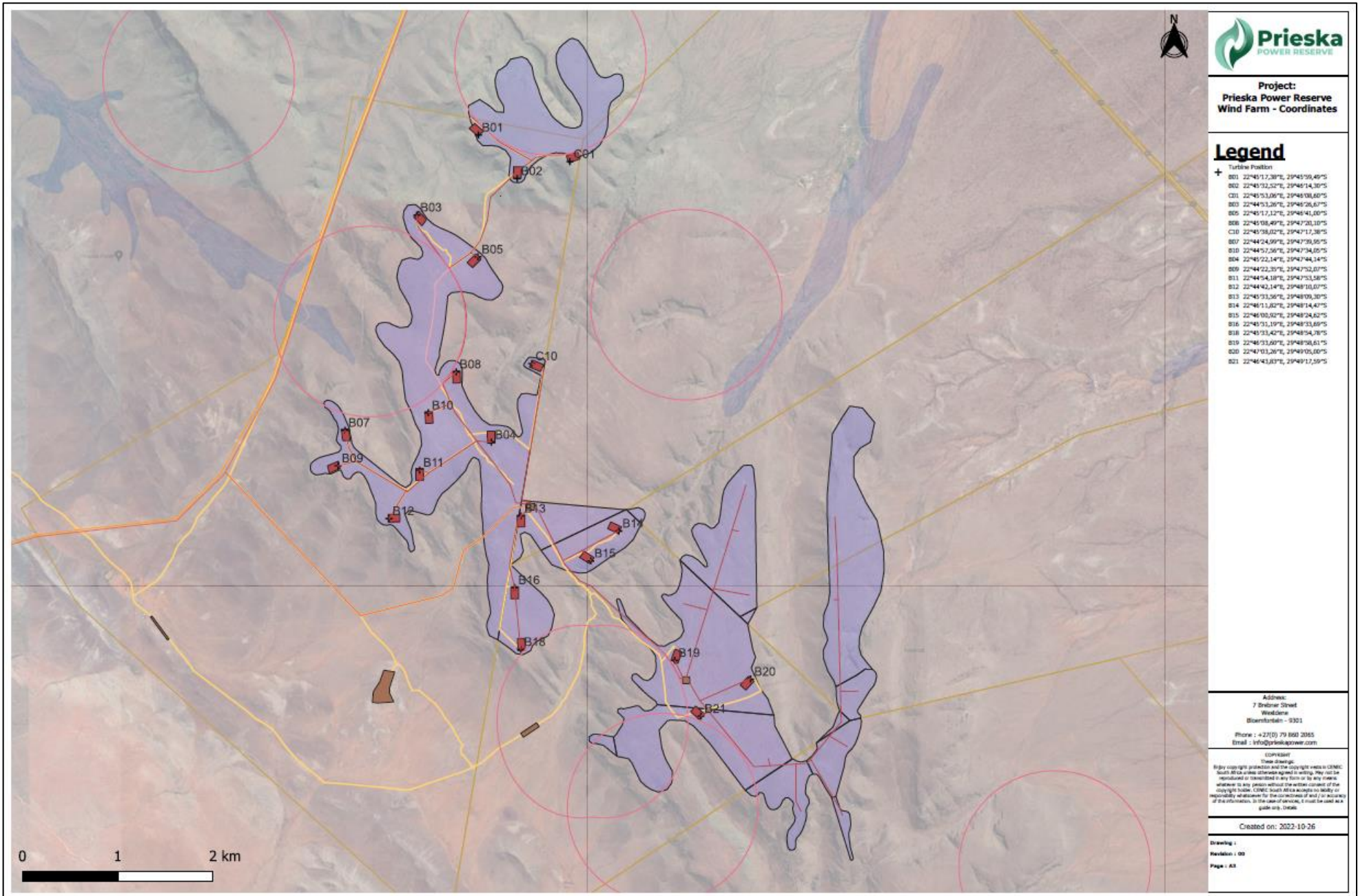


Figure 8a: Coordinate points of the North Wind Turbines (Project 1A)

3 LEGISLATIVE AND POLICY CONTEXT

This chapter presents the legislative context within which the EIA is being conducted.

3.1 Introduction

Environmental decision making with regards to wind generation facilities is based on numerous policy and legislative documents. These documents inform decisions on project level environmental authorisations issued by the Authorising Authorities as well as comments from local and district authorities. Moreover, it is significant to note that they also inform strategic decision making reflected in IDPs and SDFs. Therefore, to ensure streamlining of environmental authorisations it is imperative for the proposed activity to align with the principles and objectives of key national, provincial and local development policies and legislation. The following acts and policies and their applicability to the proposed development are briefly summarised:

- The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)
- National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA]
- National Water Act, 1998 (Act No. 36 of 1998)
- National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
- National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
- The National Heritage Resources Act, 1999 (Act No. 25 of 1999)
- Conservation of Agricultural Resources Act, 1983 (Act No. 85 of 1983)
- The National Forests Act, 1998 (Act 84 of 1998)
- The Northern Cape Nature Conservation Act, 2009 (Act 9 of 2009), Acts are applicable due to the potential significant impacts on nationally and provincially protected trees and plants.
- The White Paper on the Energy Policy of the Republic of South Africa (1998)
- Integrated Resource Plan (IRP) for South Africa (2010-2030)
- National Development Plan of 2030
- National Infrastructure Plan of South Africa
- New Growth Path Framework
- Northern Cape Provincial Development and Resource Management Plan/ Provincial Spatial Development Framework (PSDF) (2012)
- Strategic Environmental Assessment (SEA) for wind and solar PV Energy in South Africa (2014)
- Pixley Ka Seme District Municipality Final Integrated Development Plan 2020/2021
- Siyathemba Local Municipality Integrated Development Plan revised draft of 2020/2021

The key principles and objectives of each of the legislative and policy documents are briefly summarised below to provide a reference framework for the implications for the proposed activity.

3.2 Legislative context

The Constitution of South Africa (Act 108 of 1996)

The Constitution is the supreme law of the Republic, and all law and conduct must be consistent with the Constitution. The Chapter on the Bill of Rights contains a number of provisions, which are relevant to securing the protection of the environment. Section 24 states that “everyone has the right to (a) an environment that is not harmful to their health or well-being and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that – (i) prevent pollution and ecological degradation; (ii) promote

conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. The Constitution, therefore, compels government to give effect to the people's environmental right and places government under a legal duty to act as a responsible custodian of the country's environment. It compels government to pass legislation and use other measures to protect the environment, to prevent pollution and ecological degradation, promote conservation and secure sustainable development.

The National Environmental Management Act (Act 107 of 1998)

The National Environmental Management Act (No. 107 of 1998) (NEMA) expands on and specifies the principles laid down in the Constitution. The Act states that the principles of Integrated Environmental Management (IEM) should be adhered to ensure sustainable development. Accountability to the various parties that may be interested in and / or affected by the proposed development forms an integral part of the IEM procedure. This procedure requires public participation, starting during the scoping and EIA phases, when potentially significant environmental impacts must be identified. The purpose of the IEM procedure is to ensure that the environmental consequences of a development proposal are understood and adequately considered and that negative aspects are resolved or mitigated, and positive aspects enhanced.

Government Notices R326, R327, R325, and R324, in Government Gazette No 40772 (dated 07 April 2017), published in terms of Chapter 5 of NEMA (as amended), contain the EIA Regulations (GN R326), as well as a schedule of activities that may not commence without environmental authorisation from the competent authority.

This EIA was triggered by activities listed in Regulations R324, 325 and 327 and activities and requires a 'scoping and environmental impact assessment process.'

National Water Act (No. 36 of 1998)

In terms of the definitions contained in Section 1 of the National Water Act (No. 36 of 1998) (NWA) a "water resource" includes a watercourse, surface water, estuary, or aquifer. "Aquifer" means a geological formation which has structures or textures that hold water or permit appreciable water movement through them. "Watercourse" means a river or spring; a natural channel in which water flows regularly or intermittently; a wetland, lake or dam into which, or from which, water flows; and any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.

Furthermore, in terms of the definitions contained in Section 1 of the NWA, waste "includes any solid material or material that is suspended, dissolved or transported in water (including sediment) and which is spilled or deposited on land or into a water resource in such volume, composition or manner as to cause, or to be reasonably likely to cause, the water resource to be polluted".

The Minister of Water and Sanitation is allowed to regulate activities which have a detrimental impact on water resources by declaring them to be controlled activities. No person may undertake a controlled activity unless such person is authorised to do so by or under this Act.

Duty of Care to prevent and remedy the effects of pollution to water resources is addressed in Section 19. Section 20 addresses the procedures to be followed, as well as control of emergency incidents which may impact on a water resource. Recognised water uses are addressed in terms of Section 21 and the requirements for registration of water uses are stipulated in Section 26 and Section 34.

All Section 21 water uses, such as storage of water, use of effluent water, groundwater use, altering or affecting watercourses, etc. must be licensed by Department of Water and Sanitation.

National Environmental Management Waste Act (No. 59 of 2008)

The National Environmental Management Waste Act (No. 59 of 2008) (NEM:WA) reforms the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.

Regulations No. R921 (of 2013) promulgated in terms of Section 19(1) of the National Environmental Management: Waste Act (59 of 2008) determine that no person may commence, undertake or conduct a waste management activity listed in this schedule unless a license is issued in respect of that activity. It is not envisaged that a waste permit will be required for the proposed development.

National Environment Management: Air Quality Act (Act No. 39 of 2004)

The object of this Act is to protect the environment by providing reasonable measures for the protection and enhancement of the quality of air in the Republic; the prevention of air pollution and ecological degradation; and securing ecologically sustainable development while promoting justifiable economic and social development.

Regulations No. R248 (of 31 March 2010) promulgated in terms of Section 21(1)(a) of the National Environmental Management Act: Air Quality Act (39 of 2004) determine that an Atmospheric Emission License (AEL) is required for certain listed activities, which result in atmospheric emissions which have or may have a detrimental effect on the environment. The Regulation also sets out the minimum emission standards for the listed activities. It is not envisaged that an Atmospheric Emission License will be required for the proposed development.

National Heritage Resources Act (No. 25 of 1999)

Section 38 of the **National Heritage Resources Act (No. 25 of 1999) (NHRA)**, states that:

- (1) *Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as –*
 - (a) *the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length,*
 - (b) *the construction of a bridge or similar structure exceeding 50 m in length,*
 - (c) *any development or other activity which will change the character of a site –*
 - (i) *exceeding 5 000m² in extent, or*
 - (ii) *involving three or more existing erven or subdivisions thereof, or*
 - (iii) *involving three or more erven or divisions thereof which have been consolidated within the past five years, or*
 - (iv) *the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority,*
 - (d) *the re-zoning of a site exceeding 10 000m² in extent, or*
 - (e) *any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.*
- (2) *The responsible heritage resources authority must, within 14 days of receipt of a notification in terms of subsection (1) –*
 - (a) *if there is reason to believe that heritage resources will be affected by such development, notify the person who intends to undertake the development to submit an impact assessment report. Such report must be compiled at the cost of the person proposing the development, by a person or persons approved by the responsible heritage resources authority with relevant qualifications and experience and professional standing in heritage resources management, or*
 - (b) *notify the person concerned that this section does not apply.*

The responsible heritage resources authority in this case is the North West Provincial Heritage Resources Agency and / or the South African Heritage Resources Agency (SAHRA). A Heritage Impact Assessment has been conducted to inform SAHRA of any findings.

The Act protects and manages certain categories of heritage resources in South Africa. For the purposes of the Heritage Resources Act, a “heritage resource” includes any place or object of cultural significance. In this regard the Act makes provision for a person undertaking an activity listed in Section 28 of the Act to notify the resources authority. The resources authority may request that a heritage impact assessment be conducted if there is reason to believe that heritage resources will be affected. A case file has been opened on SAHRIS and all relevant documents will be submitted for their comments and approval.

Conservation of Agricultural Resources Act (No. 43 of 1983)

Section 5 of the **Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA)**, prohibits the spreading of weeds, while Section 6 and Regulations 15 and 15 E of GN R1048 address the implementation of control measures for alien and invasive plant species.

The Department of Agriculture, Land Reform and Rural Development is guided by this Act. With the development of the mentioned activities the developer must take care of the following:

Article 7. (3)b of Regulation 9238: Conservation of Agriculture Resources Act (No. 43 of 1983) (CARA) states that:

Utilisation and protection of vleis, marshes, water sponges and water courses

7.(1) “...no land user shall utilise the vegetation in a vlei, marsh or water sponge or within the flood area of a water course or within 10m horizontally outside such flood area in a manner that causes or may cause the deterioration of or damage to the natural agricultural resources.”

(3) “Except on authority of a written permission by the executive officer, no land user shall (b) cultivate any land on his farm unit within the flood area of a water course or within 10m horizontally outside the flood area of a water course.”

Consent will be required from the Department of Agriculture in order to confirm that the proposed development is not located on high potential agricultural land and to approve the long-term lease agreement.

National Forests Act (No. 84 of 1998)

The National Forests Act (No. 84 of 1998) (NFA) as amended and Regulations, Section 7 conclude that: No person may cut, disturb, damage, or destroy any indigenous, living tree in a natural forest, except in terms of a licence issued under Section 7(4) or Section 23; or an exemption from the provisions of this subsection published by the Minister in the Gazette. Sections 12 – 16 (read with S 62(2)(c)) deal with protected trees, with the Minister having the power to declare a particular tree, a group of trees, a particular woodland, or trees belonging to a certain species, to be a protected tree, group of trees, woodland, or species. In terms of Section 15, no person may cut, disturb, damage, destroy or remove any protected tree; or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister. The list of protected tree species was published in GN 716 of 7 September 2012.

The Forestry and Natural Resource Management Branch of the Department of Agriculture, Forestry and Fisheries (DAFF) is mainly concerned about the potential impacts on protected tree species. See the National Forests Act (No. 84 of 1998) (NFA) as amended, Section 12(1)(d) read with Section 15(1) and Section 62(2)(c). The list of protected tree species was published in GN 877 of 22 November 2013. No protected tree may be cut, removed, damaged, disturbed or destroyed without a valid Forest Act License.

Section 12(1) read with s15(1) of the NFA stated that the Minister may declare a particular tree, group of trees, woodland; or trees belonging to a particular species, to be a protected tree, group of trees, woodland, or species. A list of protected tree species was gazetted in GN 635 of 6 December 2019. The effect of the declaration is that

no person may (a) cut, disturb, damage or destroy; or (b) possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, or any forest product derived from a protected tree, except under a license granted by the Minister; or in terms of an exemption published by the Minister in the Gazette.

The Northern Cape Nature Conservation Act, 2009 (Act 9 of 2009)

The Act provides for the sustainable utilisation of wild animals, aquatic biota, and plants; to provide for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora; to provide for offences and penalties for contravention of the Act; to provide for the appointment of nature conservators to implement the provisions of the Act; to provide for the issuing of permits and other authorisations; and to provide for matters connected therewith.

Chapter 6 of the Act relates to the sustainable utilisation of plants, amongst other protected plants while chapter 7 relates to invasive species.

3.3 Policy context

The White Paper on the Energy Policy of the Republic of South Africa

The White Paper on the Energy Policy of the Republic of South Africa establishes the international and national policy context for the energy sector, and identifies the following energy policy objectives:

- Increasing access to affordable energy services
- Improving energy governance
- Stimulating economic development
- Managing energy-related environmental and health impacts
- Securing supply through diversity
- Energy policy priorities

The White Paper sets out the advantages of renewable energy and states that Government believes that renewables can in many cases provide the least cost energy service, particularly when social and environmental costs are included. The White Paper acknowledges that South Africa has neglected the development and implementation of renewable energy applications, even though the country's renewable energy resource base is extensive, and many appropriate applications exist.

The White Paper notes that renewable energy applications have specific characteristics that need to be considered. Advantages include:

- Minimal environmental impacts in operation in comparison with traditional supply technologies; and
- Generally lower running costs, and high labour intensities.

Disadvantages include:

- Higher capital costs in some cases;
- Lower energy densities; and
- Lower levels of availability, depending on specific conditions, especially with sun and wind-based systems.

The proposed Prieska Power Reserve Phase 3: Wind Turbines & Associated Infrastructure will not connect to the Eskom grid; the aim is to provide electricity for a Hydrogen Manufacturing Facility.

Northern Cape Provincial Development and Resource Management Plan

The Northern Cape Provincial Spatial Development Framework (further referred to as the PSDF) of 2012 in compliance with the Northern Cape Planning and Development Act 7 of 1998 (Chapter IV, Section 14), aims to “ensure that the use and allocation of the province’s resources, both renewable and non-renewable, are informed by a set of integrated and coordinated policies, objectives, implementation strategies, programmes and, where appropriate, projects aimed at:

- setting and monitoring, where appropriate, measurable standards with regard to, amongst other, public access to health, safety, amenities, education and economic opportunity;
- ensuring that the supply of public infrastructure is directed towards meeting the required standards in a prioritised, coordinated, sustainable and cost-effective way, in terms of capital and maintenance expenditure;
- ensuring the protection and sustainable utilisation of land, water and air where these are important for the maintenance of ecologically sensitive systems or processes, areas of biological diversity, public health or public amenities;
- providing an investment and expenditure programme coordinated with budgetary cycles and capable of securing financial and other resources from National Government and any other funding agencies as well as public/private sector partnerships; and
- informing and guiding the preparation and implementation of district and local municipal infrastructure management plans and land development plans” (PSDF 2012:4).

The PSDF mainly aims to build a prosperous, sustainable growing provincial economy to firstly improve social development and to eradicate poverty. The PSDF adopted the International Union for Conservation of Nature’s (IUCN) mission as their main goal. This goal states that essential ecological processes are being maintained that natural resources are being preserved and utilised in a sustainable manner, that the use of the biosphere are managed while also maintaining its potential for future generations.

The PSDF of 2012 highlights that renewable energy sources such as solar thermal and wind, comprise 25% of the Northern Cape’s energy generation capacity by the year 2020, and should be progressively phased in as appropriate into the province. The PSDF further sets out energy objectives, which include the following:

- To promote the development of renewable energy supply schemes;
- To enhance the efficiency of Eskom’s power station at the Vanderkloof power station;
- Reinforce additional electricity supply especially renewable energy projects; and
- Develop and implement innovative energy technologies to improve access to reliable, sustainable, and affordable energy services. Also recognize that the objective should be to obtain sustainable economic growth.

Lastly, the PSDF notes that the Northern Cape need to develop large-scale renewable energy supply schemes to address the growing demand in energy and to promote a green economy in the province.

The aim of this project is to provide electricity to the Prieska Power Reserve 0 emission Hydrogen manufacturing facility, to promote green economies in the area of Prieska.

National Development Plan of 2030

The National Development Plan aims to “eliminate poverty and reduce inequality by 2030” (RSA, undated). To eliminate or reduce inequality, the economy of South Africa needs to grow faster in order to benefit all South Africans. In May 2010 a draft national development plan was drafted, which highlighted the nine (9) key challenges for South Africa. The highest priority areas according to the plan are the creation of employment opportunities and to improve the quality of national education. In this regard, the plan sets out three (3) priority areas, namely, to raise employment by a faster growing economy, improve the quality of education, and to build the capability of the state in order to play a more developmental and transformative role. One of the key challenges identified was

that the economy is unsustainably resource intensive and the acceleration and expansion of renewable energy was identified as a key intervention strategy to address this challenge.

National Infrastructure Plan of South Africa

In the year 2012 the South African Government adopted a National Infrastructure Plan (hereafter referred to as the Plan). The aim of this Plan is to transform the economic landscape, while strengthening the delivery of basic services and creating new employment opportunities. This Plan also supports the integration of African communities and sets out the challenges and enablers that our country needs in order to respond to the planning and development of infrastructure with regards to fostering economic growth (RSA, 2012). The Plan has developed eighteen (18) strategic integrated projects (further referred to as SIPs). These SIPs stretch over all nine (9) provinces, covering social and economic infrastructure, and projects that enhances development and growth. Of the eighteen (18), five (5) are geographically focused, three (3) spatial, three (3) energy, three (3) social infrastructure, two (2) knowledge, one (1) regional integration, and one (1) water and sanitation focussed. One of the SIPs according to the Plan, which are energy focused and correlate to the proposed project is as follow:

- SIP 8: Green energy in support of the South African economy.

SIP 8 according to the Plan “support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the IRP 2010 and support bio-fuel production facilities”.

New Growth Path Framework

The New Growth Path was developed after 16 years of South Africa’s democracy, to respond to emerging opportunities and risks while building on policies. This framework provides a dynamic vision on how to collectively achieve a more developed, equitable and democratic society and economy. This framework 51 mainly reflects the commitment of the South African Government to create employment opportunities for its people in all economic policies (RSA, 2011b).

This framework sets out the markers for job creation and growth and identify where there are viable changes in the character and structure of production, to create a more inclusive, greener economy on the long-term. It is stated in the framework that for this framework to reach its objectives, the Government is committed to:

- Identify the possible areas of employment creation; and
- Develop a policy to facilitate employment creation especially with regards to social equity, sustainable employment, and growth in the creation of employment activities (RSA, 2011b).

This framework also identifies investments in five key areas, one of which is energy. This framework also states that the green economy is a priority area, which includes the construction and investment of renewable energy technologies like solar (RSA, 2011b). In this regard it will also assist creating employment opportunities over the medium- and long-term.

Strategic Environmental Assessment (SEA) for wind and solar PV Energy in South Africa

The Department of Environmental Affairs (DEA) has committed to contribute to the implementation of the National Development Plan and National Infrastructure Plan by undertaking Strategic Environmental Assessments (SEAs) to identify adaptive processes that integrate the regulatory environmental requirements for Strategic Integrated Projects (SIPs) while safeguarding the environment. The wind and solar photovoltaic (PV) SEA were accordingly commissioned by DEA in support of SIP 8, which aims to facilitate the implementation of sustainable green energy initiatives.

This SEA identifies areas where large scale wind and solar PV energy facilities can be developed in terms of SIP 8 and in a manner that limits significant negative impacts on the environment, while yielding the highest possible

socio-economic benefits to the country. These areas are referred to as Renewable Energy Development Zones (REDZs).

The REDZs also provide priority areas for investment into the electricity grid. Currently one of the greatest challenges to renewable energy development in South Africa is the saturation of existing grid infrastructure and the difficulties in expanding the grid. Proactive investment in grid infrastructure is thus likely to be the most important factor determining the success of REDZs.

Although it is intended for the SEA to facilitate proactive grid investment in REDZs, such investment should not be limited to these areas. Suitable wind and solar PV development should still be promoted across the country and any proposed development must be evaluated on its own merit. The proposed site does not fall within a REDZs.

Pixley ka Seme District Municipality, IDP

The Pixley ka Seme District Municipality is a relatively small economy, making up about 10% of Gross Domestic Product in the Northern Cape Province. GDP growth rates average at below 3% per annum. The economy is predominantly primary sector focused with manufacturing and tourism also contributing to the district economy. In the coming years, the sector contributions will fluctuate with the contributions by the social and personal services sector (including tourism) and the agriculture sector expected to increase and decrease respectively. This is owing to a very low growth rate in certain sectors but a sharp increase in the others, mainly because of, the investment in renewable energy generation and the SKA project.

According to the REIPPPP focus on Northern Cape Provincial Report Volume 1, March 2018, Siyathemba has 5 REIPPPP projects in the area which produce 408MW combinedly. By successfully attracting a share of the IPPPP portfolio investment, Emthanjeni, Siyathemba, Ubuntu and Renosterberg and Umsobomvu, is benefitting from substantial socio-economic development (SED) and Enterprise development (ED) contributions leveraged by the IPPPP commitments. The SED and ED contributions provide an opportunity for the identification of viable projects that will promote the economic development of Siyathemba.

The Prieska Power Reserve Project is a Presidential listed Project and will contribute greatly to the district's economy.

Siyathemba Local Municipality, IDP

Part of the Local Municipality development goals include Renewable Energy Development.

The Siyathemba Municipality believes that additional and large projects like the international SKA, the Renewable Energy boom (Solar Park and IPP's) that's coming; a potential Industrial Zone Development and new Secondary Industry Development projects will have a major boost for its economy.

3.4 Other legislation

Other legislation mainly refers to the following:

- Planning legislation governing the rezoning process and approval of the layout plan.
- Design standards and legislation for services provision such as water, sewerage, electricity, etc.
- Municipal bylaws related to building plans, building regulations, etc.

3.5 Relevant guidelines

The following guidance was considered in conducting the EIA:

- Environmental, Health, and Safety Guidelines for Electric Power Transmission and Distribution (2007)
- International Finance Corporation's Policy on Environmental and Social Sustainability (2012)
- DEA. (2013). Draft National Renewable Energy Guideline. Department of Environmental Affairs, Pretoria, South Africa

- DEA, (2012), Guideline 5 – Final companion to the National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) Regulations of 2010
- DEA, (2012), Guideline 7 – Public participation in the Environmental Impact Assessment process
- DEA, (2012), Guideline 9 – Need and desirability
- DEAT, (2006), Guideline 3 – General guide to the Environmental Impact Assessment Regulations
- DEAT, (2006), Guideline 4 – Public participation in support of the Environmental Impact Assessment Regulations
- DEAT, (2006), Guideline 5 – Assessment of alternatives and impacts in support of the Environmental Impact Assessment Regulations
- BirdLife, (2017). Birds & Solar Energy: Guidelines for assessing and monitoring the impact of solar power generating facilities on birds in Southern Africa.

3.6 Legislation Conclusion

The EIA was undertaken in accordance with the EIA Regulations (as amended in 2017) published in GNR 982, in terms of Section 24(5) and 44 of the NEMA as amended as well as all relevant National legislation, policy documents, and national guidelines.

The legislative and policy context plays an important role in identifying and assessing the potential social impacts associated with the proposed project. For this reason, the proposed development project will be assessed in terms of its fit with the key legislative, policy and planning documents discussed above.

The main findings of the review of the policy documents on all spheres of Government indicated that strong support was given towards renewable energy. The White Paper on the Energy Policy of the Republic of South Africa of 1998 stated that due to the fact that renewable energy resources operate from an unlimited resource base, i.e. the sun, renewable energy can increasingly contribute towards a long-term sustainable energy for future generations. This policy further highlights that due to the unlimited resources base of renewable energy in South Africa, renewable energy applications like wind generation facilities are more sustainable in terms of social and environmental costs. The Integrated Resource Planning for Electricity for South Africa of 2010–2030, the National Infrastructure Plan of South Africa and the New Growth Path Framework all support the development of the renewable energy sector. In particular, the IRP also indicated that 43% of the energy generations in South Africa is allocated to renewable energy applications. On District and Local level not, much attention is given explicitly to renewable sources like wind and solar energy, however the documents reviewed do make provision for energy efficiency in improving the quality of lives in terms of efficient physical infrastructure. At Provincial, District and Local level the policy documents support the applications of renewables. The Northern Cape Provincial Development and Resource Management Plan/ Provincial Spatial Development Framework (PSDF) of 2012 indicated that the development of renewable energy applications such as solar energy facilities, could be some of the means in which the Northern Cape can benefit from economically. This is true for Prieska Power Reserve Projects aiming to develop hydrogen zero emission industries in the region of Prieska.

The review of the relevant policies and documents related to the energy sector thus indicate that renewables like wind energy and the establishment of wind energy facilities and green economies are supported on all spheres of Government. The proposed Prieska Power Reserve Wind Generation Facility is therefore supported by the related policy and planning documents reviewed in this section of the report.

4 NEED AND DESIRABILITY

4.1 Need and Desirability

In keeping with the requirements of an integrated Environmental Impact process, the DAERL 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 to further explain the need and desirability for 'green energy' projects such as this one in general. The Prieska Power Reserve Phase 3: Wind Turbines & Associated Infrastructure Project forms part of the broader hydrogen and green ammonia production project, termed the zero carbon Prieska Power Reserve Industrial Hub, 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.

4.2 Feasibility consideration

The commercial feasibility for the proposed 224.4MW Prieska Power Reserve Wind Turbine Facility considered to be built 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 Wind Turbine Facility 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 and 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.

4.3 Wind 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, 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.

The potential to produce electricity from wind turbines as well as by the upcoming Active Wave Engineering (AWE) technology in South Africa is significantly greater and much more widely spread than initially thought, as is revealed by a recent study by the Council for Scientific and Industrial Research (CSIR).

The study, conducted over 11 months (May 2015 to March 2016), provides the quantified fact base for the combined use of wind and solar energy into the South African power system. It shows that many more geographic regions in South Africa could be penetrated by this combined or hybrid system. Isolated single mode solar PV and wind farms display strong short-term (intra-hour) variability. However, the portfolio allows for a more widespread higher production profile from the effect of aggregating the power output of several farms spread over a wide area which leads to the elimination of serious intermittence and other forms of short-term fluctuation. The aggregated wind portfolio power output exhibits intra-day variability with changes over several hours. This level of variability is more manageable from a system operator's point of view when wind and solar are combined in the same production system.

"The magnitude and cost competitiveness of wind power in South Africa is on par with that of solar PV. In addition, wind and solar PV are complementary, with wind supply peaking in the evening and solar PV peaking at midday" says Crescent Mushwana, Research Group Leader at the CSIR's Energy Centre.

The total technical wind power potential in South Africa if wind farms were to be installed across the country except in exclusion areas (National Parks, settlement areas, etc.) is 6 700 GW, which is a wind fleet large enough to supply the entire world's electricity demand. To generate 250 TWh per year, which is approximately today's South African electricity demand, only 0.6% of the available South African land surface would have to be dedicated to wind farms with an installed capacity of approximately 75 GW.

South Africa exhibits low seasonality in both wind and solar PV supply, which makes the integration easier, because no seasonal storage is required to balance fluctuations.

Power generation is one of the rare growth opportunities for the Northern Cape due to the wind speed levels available almost all year 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.

4.4 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 employment opportunity projection is as follows:

Table 8: Prieska Power Reserve Wind Turbine Facility job creation projection

PRIESKA POWER RESERVE PROJECTED EMPLOYMENT OPPORTUNITIES CREATED		
ITEM	CONSTRUCTION	OPERATION
Wind Facility	223	28

During the estimated 24month wind generation facility construction phase, the project will employ approximately 223 individuals of various qualifications. The majority will be provided by the local labour market. During operations, the wind facility is expected to generate up to 28 employment opportunities ranging from security staff to administration and artisans. Due the fact that there is very low skilled labour in the field of renewable energy to date, the employment structure will consist of both 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 technical maintenance and administration.

4.5 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 wind turbine 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 Wind Turbine Facility is to be located outside the Prieska urban edge. Various other similar renewable energy projects occur in the area. The Prieska Power Reserve Wind Turbine Facility serves as phase 3 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 Wind Turbine Facility requires the installation of 33 kV internal connector lines and a 132 kV distribution line to connect to the Hydrogen Industry, two electrical combiners as well as an access road to the development site. The cost of supplying the new infrastructure will be covered by the applicant.

The water required for the construction and operation of the wind facility will be sourced from the Siyathemba Municipality and will be carted to the proposed site via water tankers and JoJo tanks.

Construction waste (General Waste) will be disposed of at the existing landfill site at Prieska - agreement with the Municipality to accept the estimated volumes of general waste will be reached during the construction phase. 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 exists in the Prieska area.

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

Yes. 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, the Prieska Power Reserve Project has also since been listed as a Presidential Infrastructure Project (see Appendix D).

4.6 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 wind turbine generation due to the following factors:

- Excellent wind availability (almost all year around).
- Close to existing main transport routes and access points.
- Close to connection points to the local and national electrical infrastructure.

The ecologically sensitive areas on and surrounding the wind site have informed the optimal location and layout for the proposed wind energy 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 wind facility 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 wind facility is limited agriculture (the status-quo). However, the proposed wind 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 economic benefits and opportunities that the proposed wind 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 wind turbines.

The opportunity costs in terms of the water-use requirements of the wind 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. Since Northern Cape has been identified as an area with high potential for renewable energy generation: wind generation and availability of vast tracts of land with low sensitivity, there are a number of on-going renewable energy applications in the region already. The potential for further, future wind generating developments in the area cannot be discounted. 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 wind development would be relatively small in relation to the land resources available, with low impacts restricted to the local area.

5. DESCRIPTION OF ENVIRONMENT ISSUES

This chapter provides a full description of the process followed to reach the proposed development footprint, within the approved site, including –

- (i) details of all the development footprint alternatives considered;
- (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;
- (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;
- (iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;
- (x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and
- (xi) a concluding statement indicating the preferred alternative development location within the approved site.

5.1 Consideration of 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.

Incremental Alternatives -

Incremental different alternatives relate specifically to the project under investigation. ‘Alternatives’ in relation to a proposed activity means different ways of meeting the general purpose and requirements of the activity, which may include alternatives for:

- Location where the activity is proposed to be undertaken,
- Design and Layout of the activity,
- Technology to be used in the activity, and
- The operational aspects of the activity.

5.1.1 Land-use Alternatives

Agriculture

At present the proposed site is zoned for agricultural land-use. 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 farms portions and therefore has minimal influence on the significance of agricultural impacts. **Hence, agricultural land use is not a preferred alternative.**

5.1.2 Renewable Energy Technology Alternatives

Solar and Biomass energy

Where the “activity” is the generation of electricity for powering a hydrogen manufacturing industry 24 hours of the day, possible reasonable and feasible land-use alternatives for the proposed property could include other renewable sources such as solar or biomass. However, since a 24hour cycle of energy supply is required for the hydrogen plant in Prieska, night-time energy generation is crucial. **Neither solar nor biomass sources are feasible nor reasonable energy generation sources during night-time and is therefore not a preferred alternative.**

Wind energy

One of the most important criteria to take into consideration when selecting a potential site for a wind energy facility is the availability of a reliable wind resource. Wind resource is defined in terms of average wind speed and includes Weibull distribution (used to describe wind speed distributions); turbulence, wind direction, and pattern of wind direction (as depicted by a wind rose). These factors are all key considerations used in determining whether a site is suitable for the development of a wind energy facility.

A Pre-feasibility study completed by CENEC Zero emission Energy identified that the mountain range earmarked in this study for the wind energy facility is almost flat on the top and elevation varies from 1 220 m to 1 320 m. The average wind speed is exceeding 7 m/s @150 m and is available almost for the whole year. This profile has the potential for high yields using wind turbines, which will incorporate the latest technology to optimise yields in the windspeed-range of 6 – 9 m/s.

Given the above, the development of a **Wind Energy facility is the preferred technology to be developed on site** because:

- The site has a good wind resource based on Cenec data (pre-feasibility Study) and on-site measurements;
- 24 Hour energy requirements mandates the Hydrogen Facility one component of the Prieska Power Reserve overall project to have renewable energy sources during night-time.

Since the alternative technologies considered were deemed not to be reasonable and feasible for the generation of energy during night-time, no other renewable energy technologies alternatives were further assessed during the EIA Phase.

5.1.3 Site Alternatives

As per the requirements listed within Appendix 2 (2) (g) (ix) of the 2014 EIA Regulations (as amended), a site selection matrix should be provided to show how the preferred site was determined through a site selection process. Within this context, it is assumed that the “site” referred to in the Regulations are the farms or land portions on which proposed Prieska Power Reserve Wind Energy Facility will be located.

On a site-specific level, the site selection factors of land availability, environmental sensitivities, distance to the Hydrogen Manufacturing Industry, site accessibility, topography, fire risk, current land use and landowner willingness were all considered to determine feasible sites. Therefore, considering the broader scope of the Prieska Power Reserve Project for Prieska in the manufacturing of Hydrogen, no other site locations were considered feasible.

The preferred site for the proposed Prieska Power Reserve Wind Energy Facility extends over the following farm portions:

- Portion 2 of the Farm Prieska’s Poort 51
- Portion 11 of the Farm Prieska’s Poort 51
- Portion 3 of the Farm Karabee 50
- Portion 4 of the Farm Karabee 50
- Portion 8 of the Farm Karabee 50
- Portion 9 of the Farm Karabee 50
- Portion 12 of the Farm T’Keikams Poort 71

The Prieska Power Reserve site was deemed feasible for the proposed wind turbine facility. A detailed outline of the outcomes of the site selection is detailed in Table 9.

Table 9: Site selection factors and suitability of the Prieska Power reserve site for the development of the proposed Wind Energy Facility

Factor	Suitability of the preferred Site
Land Availability	The site is of a suitable size for the proposed project. The land available to develop the Wind Facility extends approximately 1007 ha, while only approximately 33 ha (i.e. .3.2% of the available land) will be required for the proposed Wind Facility.
Environmental Sensitivity	The site falls within mostly ‘Other Natural Areas’, and “Ecological Support Areas’ in terms of the NC Biodiversity Plan. Although some environmental features that must be avoided due to high environmental sensitivities (mostly related to the presence of raptor nest), suitable land is still available following these exclusions, to make the development feasible.
Wind speed Levels	
Distance to the proposed hydrogen plant in Prieska	The site is located approximately 13 km from the hydrogen manufacturing plant proposed by Prieska Power Reserve.
Site Accessibility	Access to the site is currently possible via existing farm access road from the public roads to the north-west of the site. Existing roads (such as the R357, leading towards Prieska) will be used to gain access to a farm gravel road that runs to the preferred site.
Current Land Use	Agriculture – Low potential grazing.

Given the outcome of the site selection process, the **Prieska Power Reserve Wind Energy Facility site is the only reasonable and feasible site, and therefore the preferred site and no other site alternatives were considered further in the EIA process.**

5.1.4 Layout Alternatives

Based on the findings of the specialist studies an environmental sensitivity map has been produced. This map shows the sensitivities on site (terrestrial, watercourse features, and avifauna). Based on this map, the preferred location for the Wind Facility, avoids the sensitive features that were identified by the specialists. Based on the environmental sensitivities identified, a site layout has also been determined for this project.

Semi-detailed engineering design has also been undertaken to develop the current footprint that is technically feasible in the challenging topographic onsite conditions. The current layout is thus a culmination of extensive technical, economic, and environmental planning.

Therefore, the findings of a range of specialist inputs have been used to inform the layout of the proposed facility within the preferred site and the current layout is the only reasonable and feasible one, and therefore the preferred layout with no further alternatives considered in the EIA process.

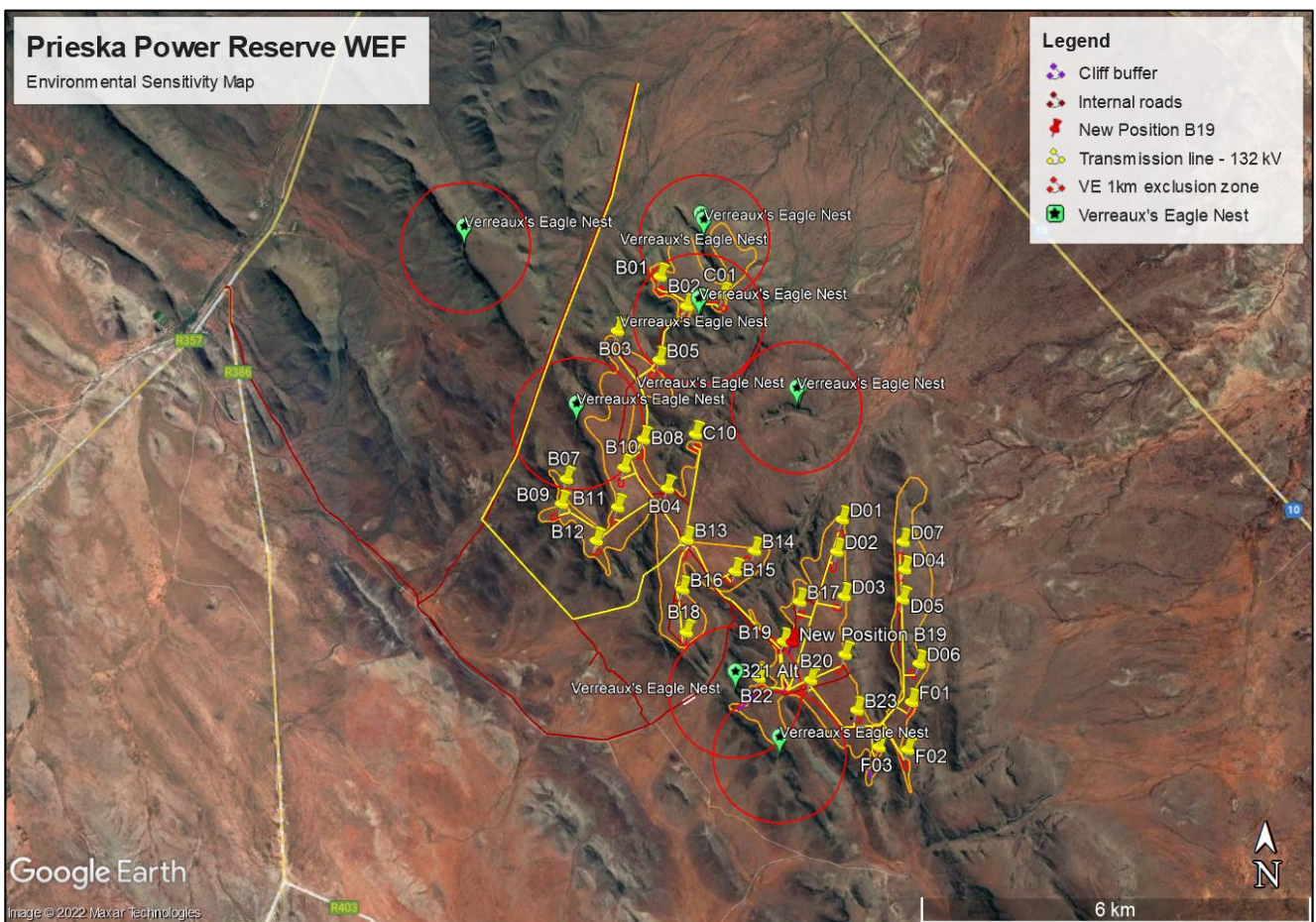


Figure 9: Environmental Sensitivity Map

5.1.5 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 wind facility 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. A detailed assessment of the advantages and the disadvantages of not proceeding with the proposed 224 MW Wind Generation Plant are found below.

The costs / implications and benefits of implementing the “no-go” alternative is presented in **Table 9**. Implementing the “no-go” alternative would result in the proposed development not being developed and contributing to environmental, social and economic change (positive and / or negative) in the area surrounding the proposed project site.

Table 9 Cost Benefit Analysis of the “no-go” alternative

COST	BENEFITS
<ul style="list-style-type: none"> ✓ No benefits will be derived from the implementation of an additional land-use, especially to the Siyathemba local community; ✓ Local communities will continue their dependence on agriculture production and government subsidies. The local municipality’s vulnerability to economic downturns will increase because of limited access to capital and the downscaling of mining in the area ; ✓ No additional employment opportunities will be created. Both skilled and unskilled employment opportunities are anticipated to be created for the construction and operation of the facility; ✓ Potential positive socio-economic impacts likely to result from the project, such as increased local spending and the creation of local employment opportunities, will not be realised. 	<ul style="list-style-type: none"> ✓ No vegetation will be removed or disturbed during the development of the proposed Turbines project; ✓ No biodiversity (fauna and flora) will be removed or disturbed during the development of these Facilities ✓ No birds will be impacted through the loss of their habitat which can lead to displacement, mortalities due to collisions of birds with wind turbines; ✓ No change to the current landscape will occur-the visual character of the area will remain unchanged; ✓ No influx of job seekers. ✓ No visual impact associated with the construction phase or the presence and rotation of wind ✓ turbines during the operational phase of the proposed project; ✓ No additional traffic generation during the construction of the proposed facility; and ✓ No additional water uses during the construction phase.

While the no-go alternative will not result in any negative environmental impacts; it will also not result in any positive community development or socio-economic benefits. It will also not assist the Prieska Power Reserve Project to materialize by providing electricity for a proposed Hydrogen Manufacturing plant, a Presidential supported project for the country. **Hence, the no-go alternative is not currently the preferred, or a reasonable and feasible alternative to be considered in this EIA process.**

5.1.6 Concluding statement on alternatives

In conclusion the preferred alternative entails the development of the 224MW Prieska Power Reserve Wind Turbine Facility and associated infrastructure with a design layout refer to in Figure 10:

When considering the information provided by the specialists with regards to the layout selection criteria, the preferred layout is most suitable since it will consider environmental sensitive features and remain outside calculated buffer zones.

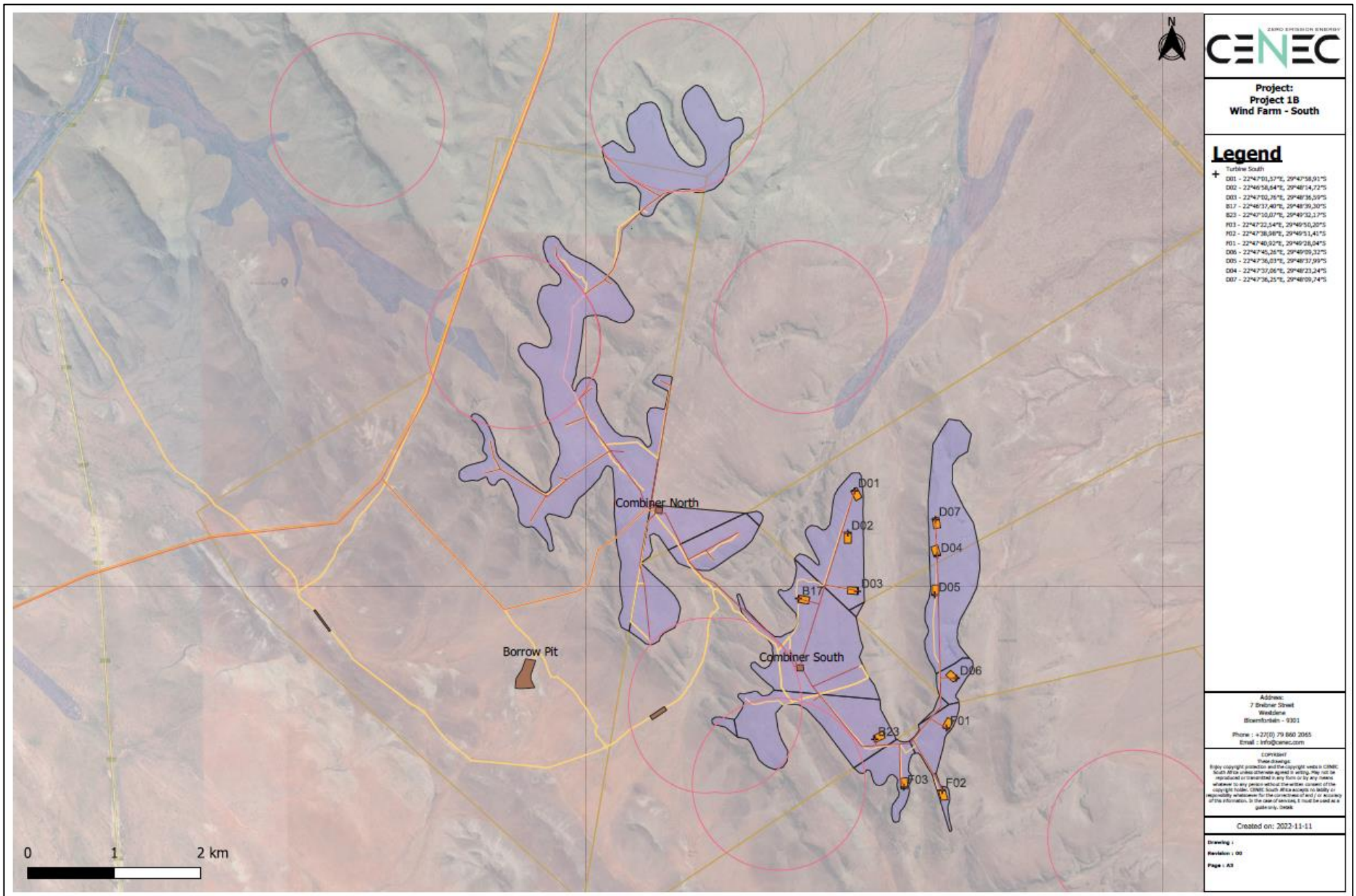


Figure 10: Coordinate points of the South Wind Turbines (Project 1B)

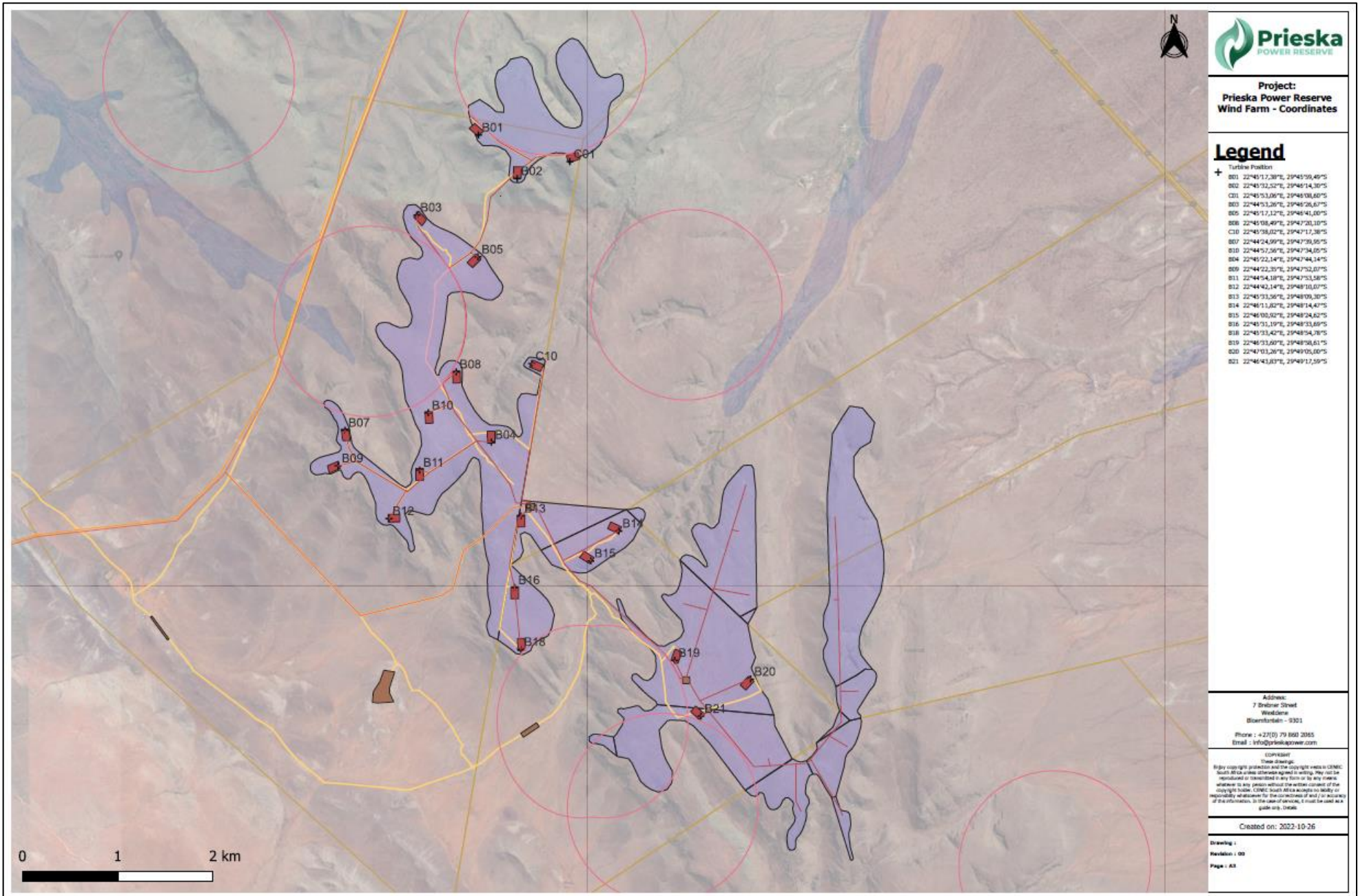


Figure 10a: Coordinate points of the North Wind Turbines (Project 1A)

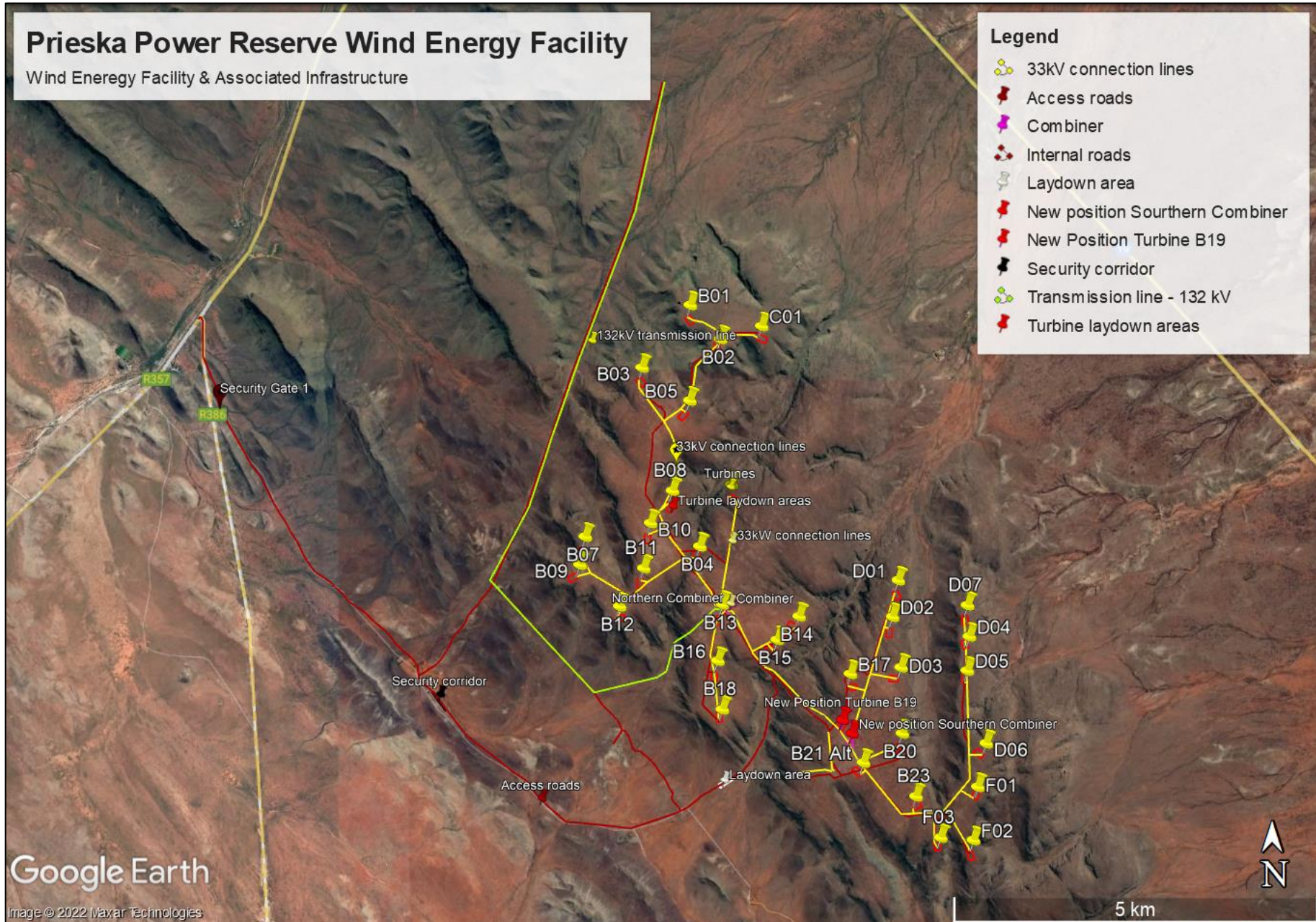


Figure 10b: Wind Energy Facility with associated Infrastructure

5.2 The environmental attributes associated with the preferred alternative

The following sections provide general information on the biophysical and socio-economic attributes associated with the preferred alternative.

5.2.1 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 assessment areas are situated approximately 10 km south-east of the town of Prieska. The town forms part of the Siyathemba Local Municipality which in turn, forms part of the Pixley Ka Seme District Municipality, Northern Cape Province. Access to the assessment areas is obtained by way of the R 357 provincial road and subsequent dirt roads, from the west. 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.

5.2.1.1 Biophysical Environment

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.

Topography and Landscape

The study area is situated on a mountain range that is almost flat on the top and elevation varies from 1 220 m to 1 320 m. The average wind speed is exceeding 7 m/s @150 m and is available almost for the whole year. This profile has the potential for high yields using wind turbines, which will incorporate the latest technology to optimise yields in the windspeed-range of 6 – 9 m/s.

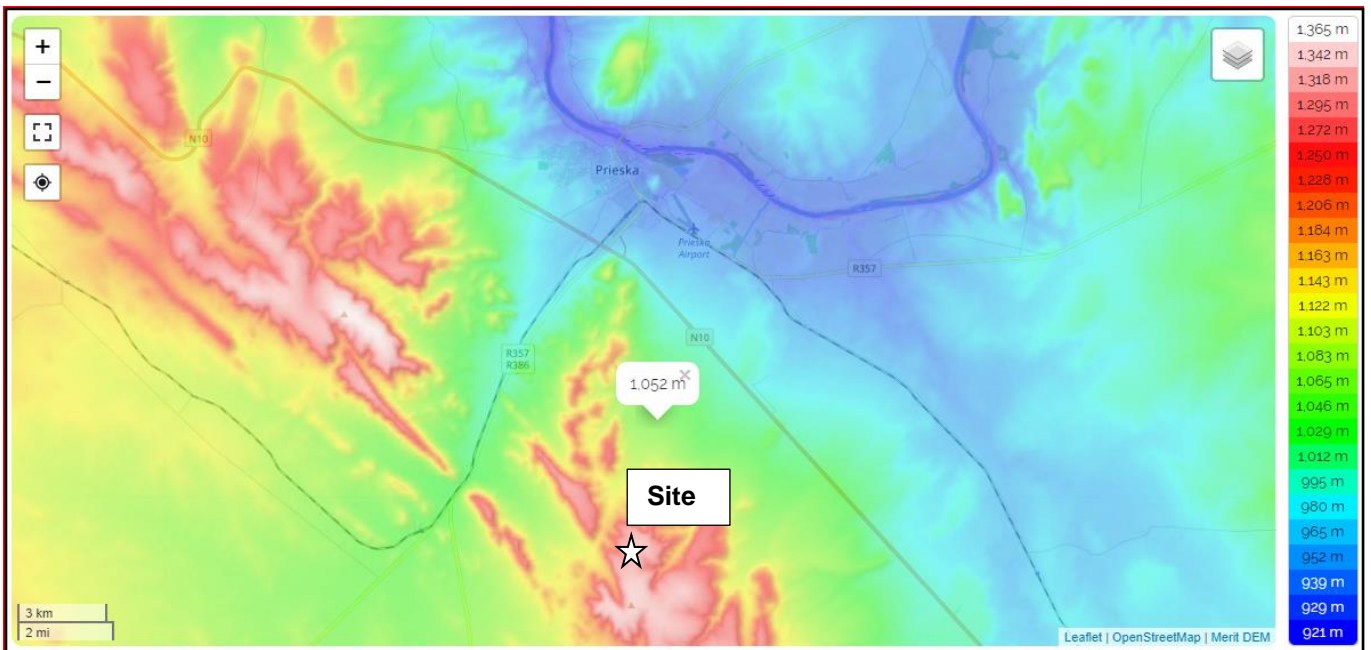


Figure 11: Elevation map of the Prieska area, average elevation 1052m (<https://en-za.topographic-map.com/maps/77oq/Prieska/>)

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

The three mountaintop plateau assessment areas have a complicated geology: banded iron formation and amphibolites of the Asbestos Hills Subgroup. Metamorphic rocks of the Mokolian Erathrem include quartzites and gneisses of the Korannaland Supergroup. Soils are shallow and skeletal (Mispah and Glenrosa are dominant), mainly of Ib and Ic land types.

The flat bottomland assessment areas surrounding the mountain range, 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.

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.

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.

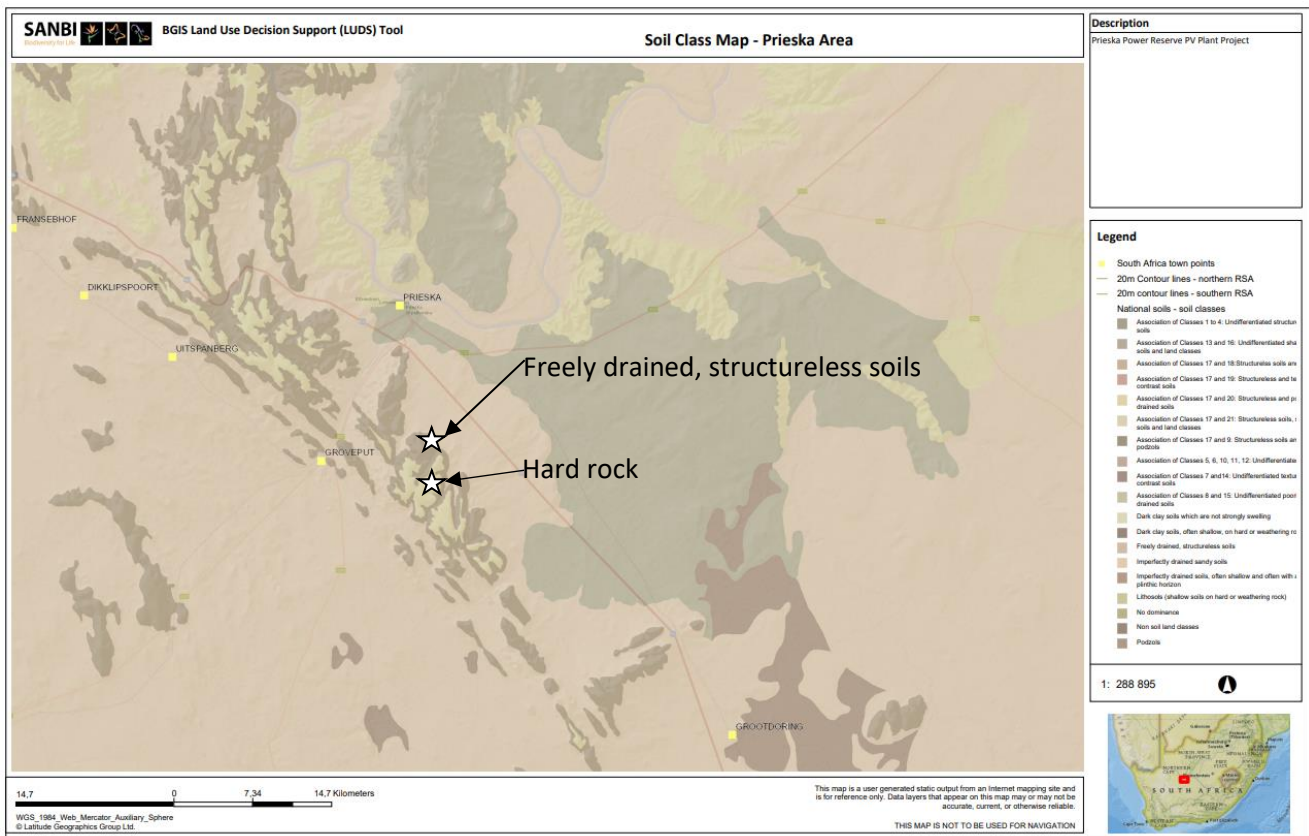


Figure 12: Soil map of the Prieska area (Sanbi BGIS)

Terrestrial Environment

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).

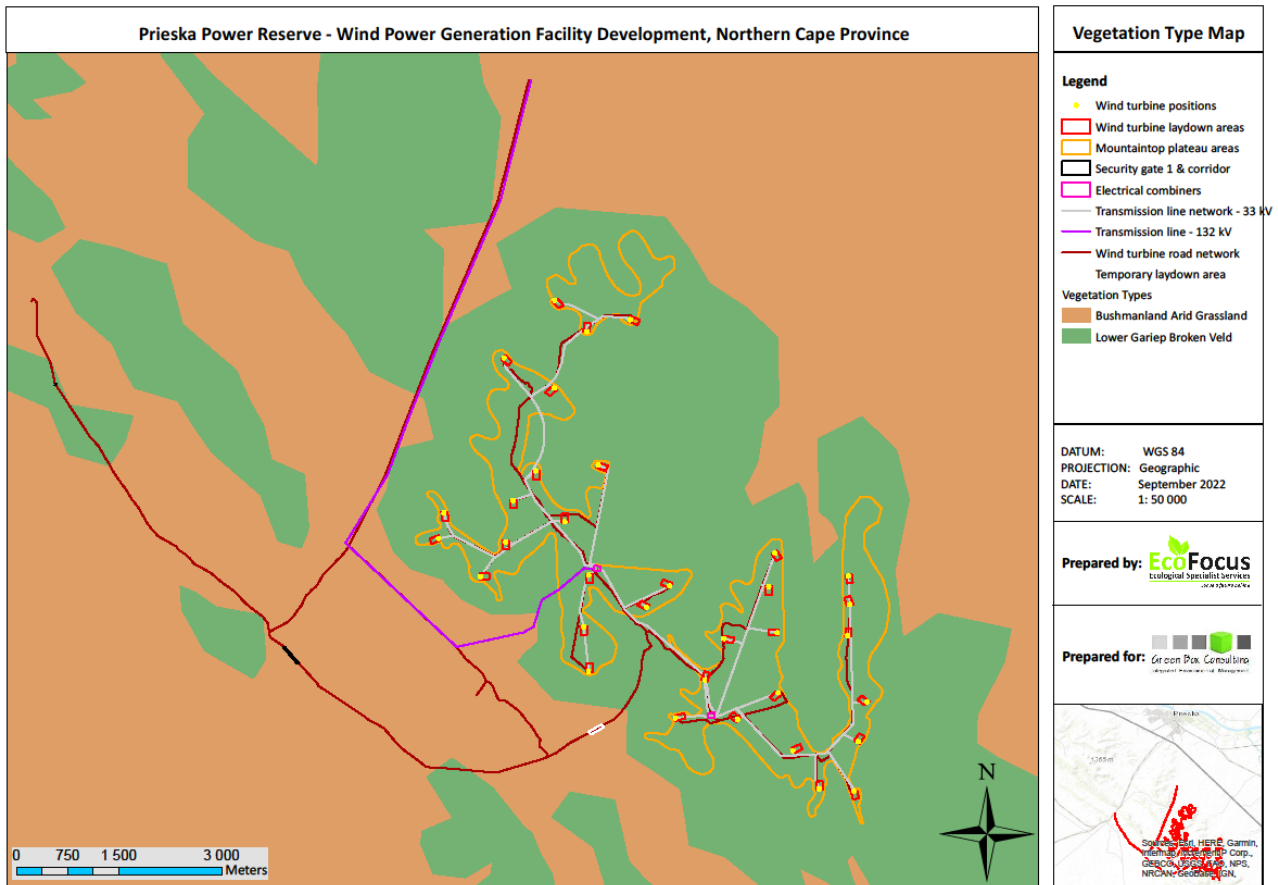


Figure 13: Vegetation map illustrating the vegetation type associated with the assessment area as well as the 132 kV electrical transmission line and access/service road (EcoFocus, 2022)

Conservation Status

The entirety of the three-mountaintop plateau- and the flat bottomland assessment areas form part of a broad mosaic of Ecological Support Area (ESA) and Other Natural Area (ONA), according to 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).

See conservation status maps below.

See conservation status maps below.

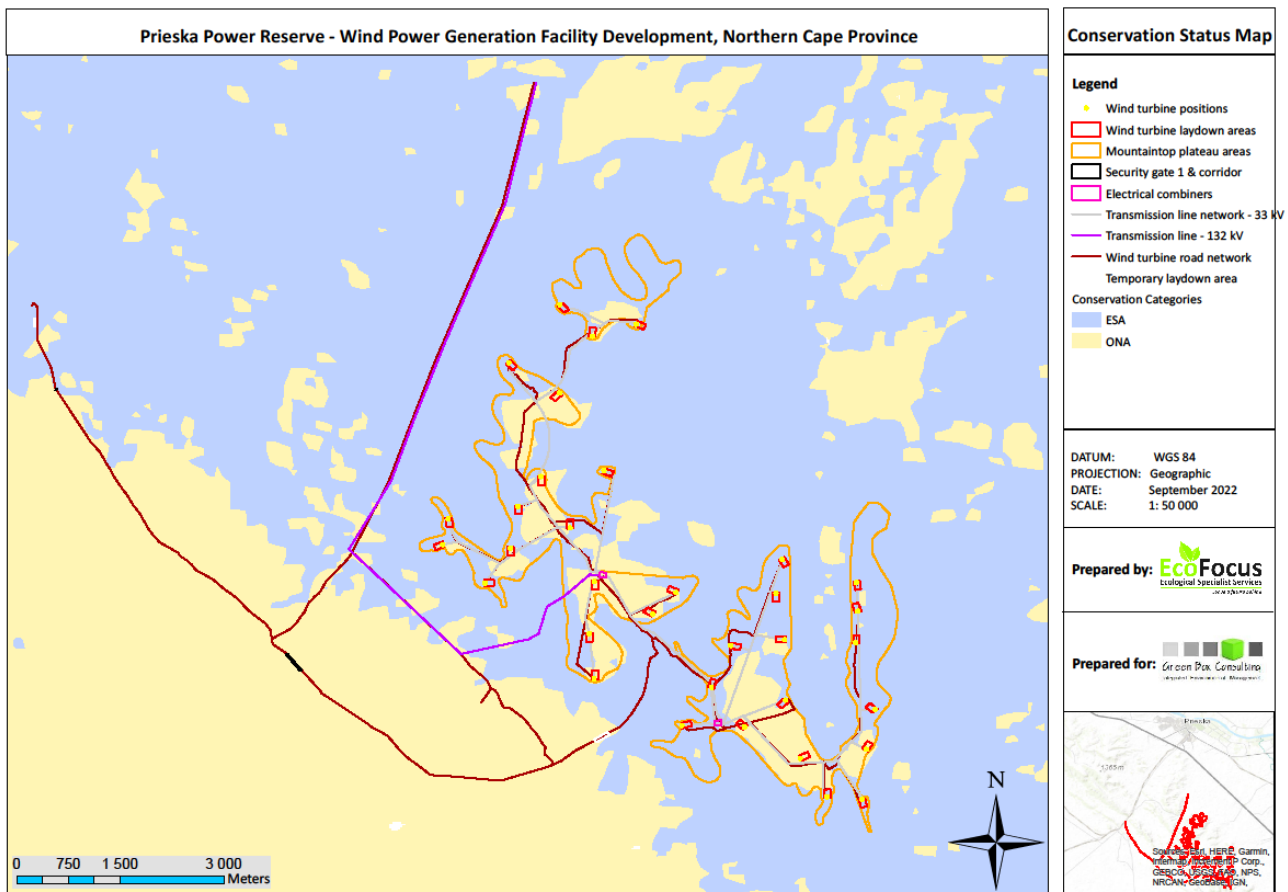


Figure 14: Conservation status map illustrating the conservation categories associated with the assessment area as well as the 132 kV electrical transmission line and access/service road (EcoFocus, 2022)

Water Catchment- and Drainage

An extensive linear topographic highpoint/ridge apex which roughly lies in a north-west to south-east direction, traverses the two southerly situated mountaintop plateaus. This highpoint/ridge apex and subsequently also the mountain range act as a natural linear surface water runoff- and drainage separator, between the portions of the three mountaintop plateaus and surrounding flat bottomland areas situated north and south of the highpoint/ridge apex, respectively. Surface water runoff from the three mountaintop plateaus and surrounding flat bottomland areas consequently mainly drains either in a northerly- or southerly direction, depending on which side of the highpoint/ridge apex the area is situated.

The portions of the mountaintop plateaus situated to the north of the highpoint/ridge as well as the overwhelming majorities of the proposed main site access/service road and 132 kV electrical transmission line with its associated access/service road, fall within the D72A quaternary surface water catchment- and drainage area. The portions of the mountaintop plateaus situated to the south of the highpoint/ridge as well as the most southerly portions of the proposed main site access/service road and 132 kV electrical transmission line with its associated access/service road, however, rather fall within the D62H quaternary surface water catchment- and drainage area. The entirety of the three mountaintop plateaus and the flat bottomland areas surrounding the mountain range, fall within the Lower Orange Water Management Area (WMA 14).

The proposed wind turbine access/service road network and the 33 kV electrical transmission line network with its associated access/service road network, will merely traverse five (5) small ephemeral water drainage lines/preferential flow paths as well as a single significant first-order ephemeral watercourse, throughout the three mountaintop plateaus. These drainage lines/flow paths and single significant watercourse assist with

channelling and discharging surface water runoff from small portions of the mountaintop plateaus, towards the surrounding flat bottomland areas.

From a hydrological perspective, these drainage lines/flow paths and single significant watercourse therefore merely play a minor assisting role in the local catchment and drainage, associated with surface water runoff from the mountain range. These drainage lines/flow paths and single significant watercourse are therefore not viewed as being of high conservational significance/value, from a hydrological or ecological perspective. It is however not anticipated that the proposed development at these flow path/drainage line- and single significant watercourse crossings, should significantly impede or impact on their flow regimes.

Due to the lack of continuous water flow throughout the mountaintop plateaus and flat bottomland areas surrounding the mountain range, none of the watercourses and flow paths/drainage lines 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 significant watercourses

Terrestrial environmental sensitivity

The mountaintop plateaus as well as the flat bottomland areas and transitional zone surrounding the mountain range, both scored moderate Ecological Importance and Sensitivity (EIS) values and are therefore viewed as being of moderate conservational significance/value for habitat preservation and ecological functionality persistence in support of the surrounding ecosystem, broader vegetation type, Ecological Support Area (ESA), nationally- and provincially protected species individuals and the ecological functionality and -integrity of the local and broader quaternary surface water catchment- and drainage area.

The mechanical clearance associated with the proposed development, will in all probability completely transform the majority of the existing surface vegetation throughout all the different footprint areas, associated with the mountaintop plateaus as well as the flat bottomland areas and transitional zone surrounding the mountain range. The combined total size of all these different proposed footprint areas is however minute relative to the landscape surrounding them. The small wind turbine laydown areas are also spread-out and spaced far apart throughout the mountaintop plateaus. The local and broader region surrounding the assessment areas furthermore constitutes a vast, continuous undeveloped natural landscape. The applicant also intends to establish and manage the three mountaintop plateaus as an eco-friendly wildlife camp. It is consequently not anticipated that the proposed development would necessarily pose any significant risk to achieving and maintaining national and/or provincial conservation and persistence targets of the area or to the continued ecological functionality and -integrity of the local and broader surrounding landscape.

Destruction of-/damage to Red Data Listed, nationally- and/or provincially protected species individuals/habitats associated with the assessment area, terrestrial and aquatic alien invasive species establishment throughout the flat bottomland areas and transitional zone surrounding the mountain range as well as impeding and contamination of the flow regimes of the numerous watercourses and water drainage lines/preferential flow paths, within the associated local and broader quaternary surface water catchment- and drainage area, were identified and addressed as significant potential long-term ecological impact, associated with the construction phase of the proposed development.

Continued impeding and contamination of the flow regimes of the numerous watercourses and water drainage lines/preferential flow paths, within the associated local and broader quaternary surface water catchment- and

drainage area was furthermore identified and addressed as a continued significant potential long-term ecological impact, associated with the operational phase of the proposed development.

Although the broader region surrounding the assessment area constitutes a vast, continuous undeveloped natural landscape, the proposed development merely forms a small part of the first phase of a significantly sized and extensive renewable energy power generating hub, which is envisaged for the broader area to the south of the town of Prieska, over time. Significant future development expansion and subsequent transformation in the same geographical area, which could likely lead to further cumulative ecological impacts, will therefore in all probability take place within the local and broader area, over time.

The significant potential long-term ecological impacts identified for the proposed development, could therefore potentially add moderate cumulative impact to the existing and anticipated future negative impacts, associated with the envisaged significantly sized and extensive renewable energy power generating hub, over time.

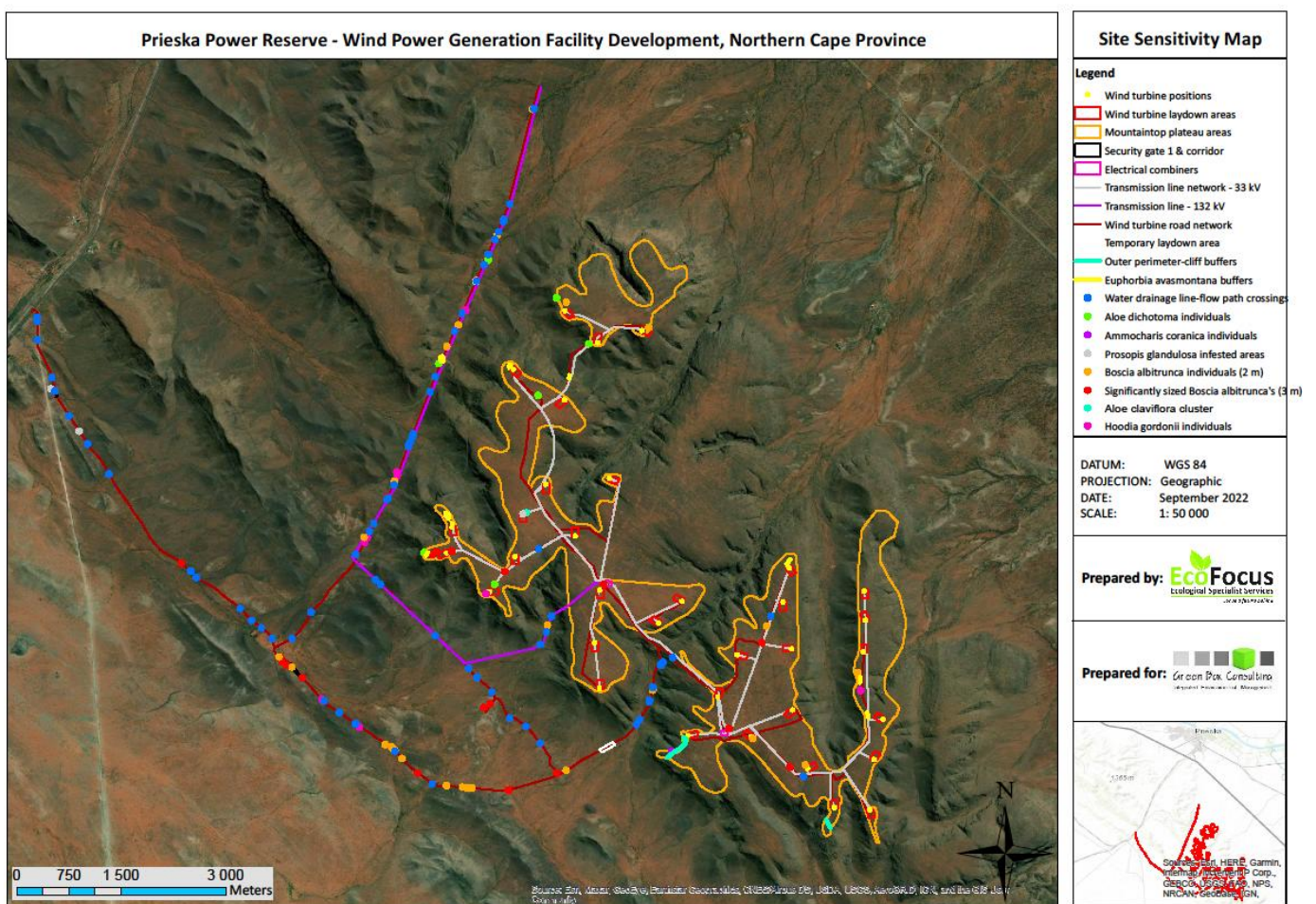


Figure 15: Terrestrial environmental sensitivity map

Avifauna

The footprint of the wind facility field of the proposed development is currently utilised, or have the potential of being utilised, by a range of bird species. The SABAP2 data, combined with the result of the monitoring surveys, indicate that a total of 197 bird species could potentially occur within the broader area. Of these, 22 species are classified as priority species for wind energy development. Nine (9) of these are South African Red List species.

The mountainous areas of the wind facility footprint may be utilised by specifically the Verreaux Eagle. The Verreaux Eagle is rated “Vulnerable”. Additionally, there may be a presence of the Lanner Falcon, also rated as “Vulnerable” in South Africa.

After completion of all transect counts the following number of species composition is recorded:

Table 10: The results of the transect counts (three surveys)

Turbine site	
Species composition	Number
All Species	81
Priority Species (9%)	7
Non-Priority Species	74
Total count	Count
Drive transects	1379
Walk transects	719
Total:	2098
Control site	
Species composition	Number
All Species	70
Priority Species (6%)	4
Non-Priority Species	66
Total count	Count
Drive transects	1370
Walk transects	1315
Total:	2685

Figures 16 and 17 present the priority species transect count data for the development site and the control site, presented as an Index of Kilometric Abundance (IKA = birds/km).

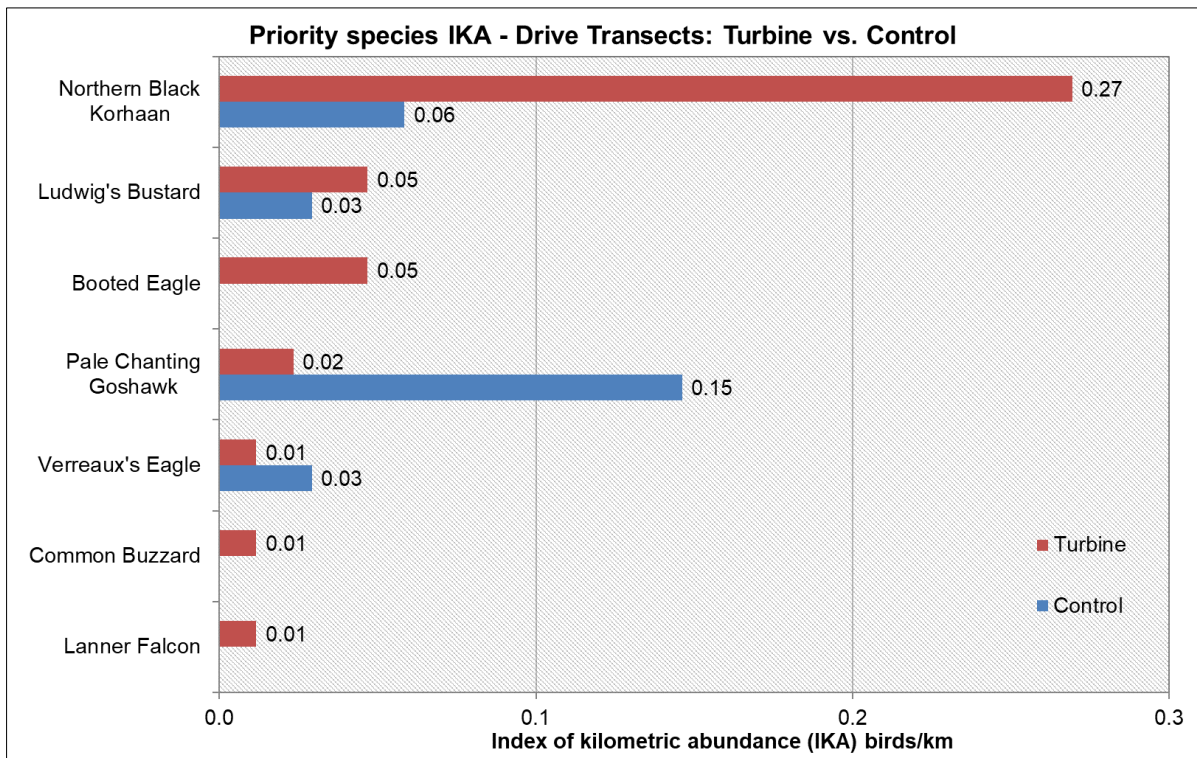


Figure 16: IKA for drive transect wind priority species at the development area vs. control site

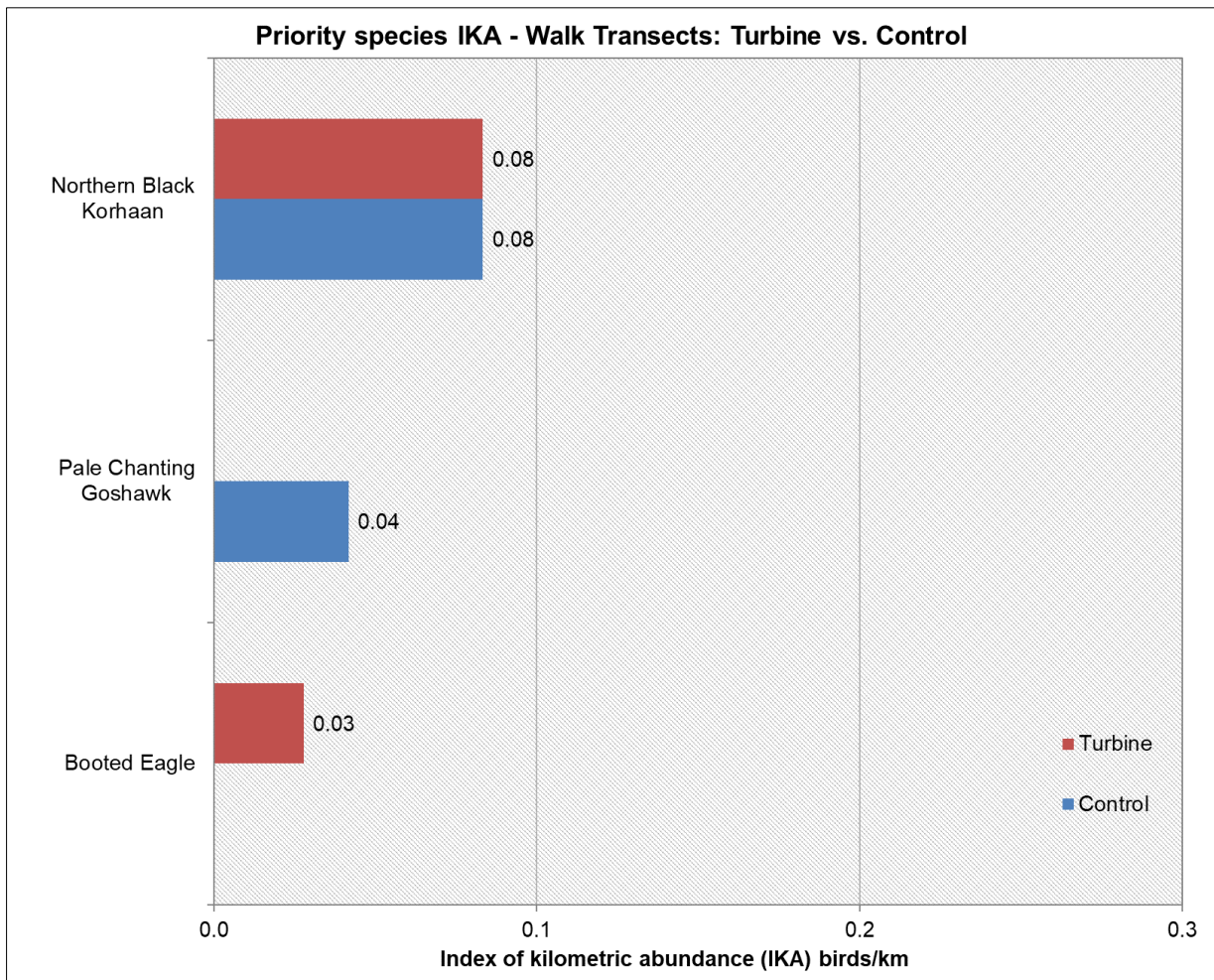


Figure 17: IKA for walk transects wind priority species at the development area vs. control site.

The results of the focal point monitoring are tabled in Table 11:

Table 11: The results of the focal point monitoring conducted during three surveys

Focal Point Name	FP type	Territory occupied?
E 1	Verreaux's Eagle nest	Yes
E 2	Verreaux's Eagle nest	Yes
E 3	Verreaux's Eagle nest	Yes
E 4	Verreaux's Eagle nest	Yes
E 5	Verreaux's Eagle nest	Uncertain
E 6	Verreaux's Eagle nest	Yes
E 7	Verreaux's Eagle nest	Yes
E 8	Verreaux's Eagle nest	Yes

Incidental counts

Table 12 provides an overview of the incidental sightings of priority species during the three surveys. These are records obtained outside of formal transect and vantage point counts.

Table 12: Incidental sightings of priority species made in the course of the three surveys

Priority (Incidentals)	Species	Survey 1	Survey 2	Survey 3	Grand Total
Northern Black Korhaan	<i>Afrotis afraoides</i>	5	3	4	12
Pale Chanting Goshawk	<i>Melierax canorus</i>	5	3	1	9
Verreaux's Eagle	<i>Aquila verreauxii</i>	0	3	6	9
Grey-winged Francolin	<i>Scleroptila afra</i>	0	1	5	6
Booted Eagle	<i>Hieraaetus pennatus</i>	2	2	0	4
Karoo Korhaan	<i>Eupodotis vigorsii</i>	0	0	2	2
Lanner Falcon	<i>Falco biarmicus</i>	2	0	0	2
Jackal Buzzard	<i>Buteo rufofuscus</i>	1	0	0	1
Tawny Eagle	<i>Aquila rapax</i>	0	0	1	1

Figure 18 shows the spatial distribution of the priority species recorded during transect counts and incidental sightings during three surveys.

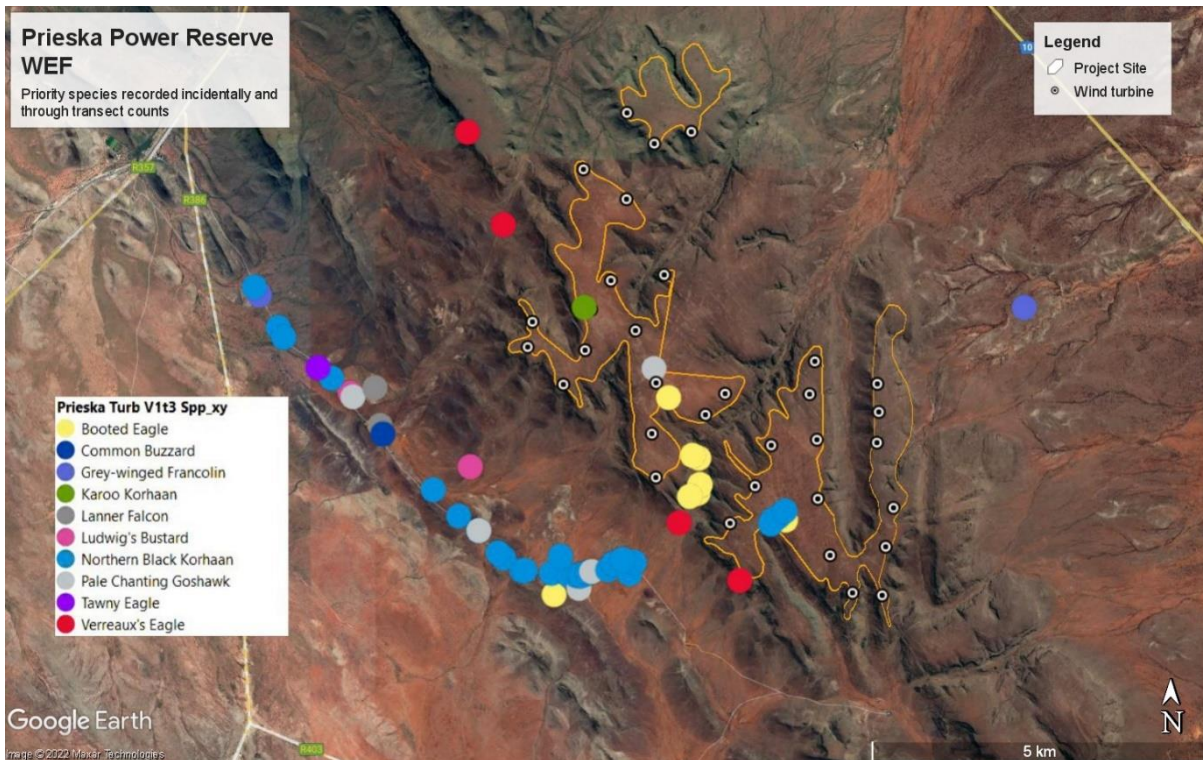


Figure 18: shows the spatial distribution of the priority species recorded during transect counts (Chris van Rooyen Consulting, 2022)

Vantage points

Flight patterns of priority species were recorded for 162 hours (54 hours per VP) at 3 vantage points at the development site in three bands (high i.e., above rotor altitude; medium i.e. at rotor altitude; low i.e. below rotor altitude). Approximate flight altitude was visually judged by an observer with the aid of binoculars. Priority species were observed for a combined 1 hour and 33 minutes. The passage rate for priority species was 0.23 birds/hour, or approximately 3 birds per day.¹

Figure 19 presents the data gathered during vantage point watches at the development site.

¹ Assuming 13 hours of daylight averaged over all seasons

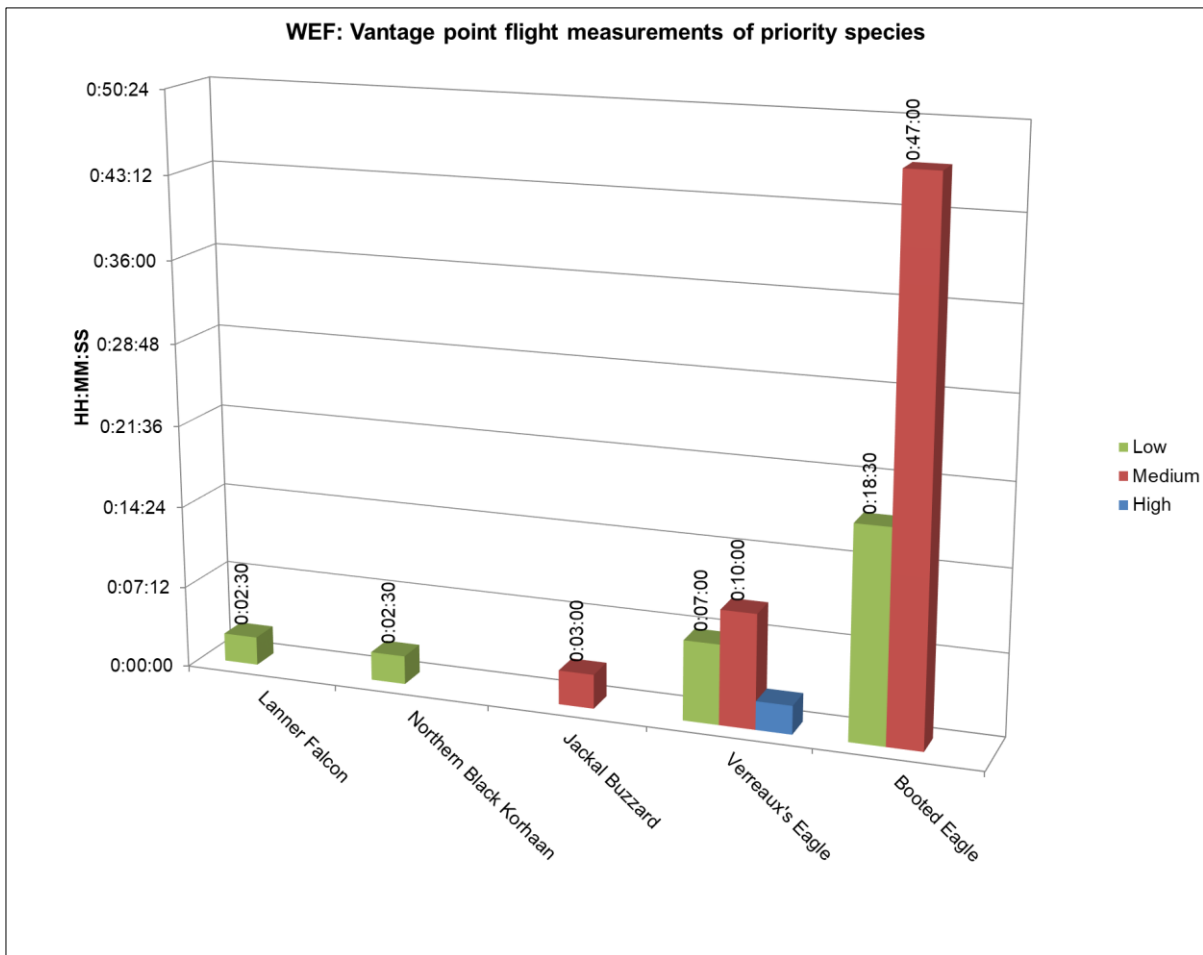


Figure 19: Flight time and altitude recorded for all individuals of priority species at the Project Site (162 hours of observation). Time is indicated in hours: minutes: seconds. Flight altitude is indicated as low (green = below rotor altitude), medium (red = within rotor altitude) and high (blue = above rotor altitude) (Chris van Rooyen Consulting, 2022)

Verreaux's Eagle (SA status: Vulnerable)

There are eight (8) suspected Verreaux's Eagle (SA Red Data status = Vulnerable) nests within 8km or less of the proposed turbine area. The second edition of the Verreaux's Eagle best practice guidelines (VE guidelines) recommends the application of the VERA model in addition to the conventional monitoring, to determine high risk areas that need to be avoided by wind turbines². Alternatively, if the developer opts not to use VERA, the guidelines recommend a pre-cautionary buffer of 5.2km around the nests, which should provide the approximate equivalent of the VERA high and medium risk zones. The guidelines recommend that no turbines are constructed within the 5.2km precautionary zone if possible. The guidelines further recommend that no turbines should be constructed under any circumstances closer than 3.7km from a nest, which is the equivalent of the VERA high risk zone. If the high and medium-risk zones are avoided, monitoring can be completed after one year. Should the developer choose to place turbines in medium-risk areas, then the guidelines recommend that monitoring is extended to two years. All turbines in medium-risk zones should be pro-actively mitigated with a proven mitigation strategy.

² MURGATROYD, M., BOUTEN, W. & AMAR, ARJUN. 2020. A predictive model for improving placement of wind turbines to minimise collision risk potential for a large soaring raptor. Journal of Applied Ecology. 2020;00:1 – 12. DOI: 10.1111/1365-2664.13799.

However, in this instance the developer is proposing a novel mitigation strategy, namely, to implement blanket shutdown of turbines during daylight hours, starting at first light before sunrise, continuing throughout the day and for a period after sunset during dusk until nightfall. The idea is that the above requirements for buffers and two years of monitoring will fall away, due to the proposed blanket shutdown of turbines in daytime, except for a 1 (one) km no disturbance buffer around nests. With the permission of the developer, the specialists engaged with BirdLife South Africa (BLSA) to get their views on the proposed strategy. The response from Samantha Ralston - Paton, Birds and Renewable Energy Project Manager, was cautiously supportive of the proposed strategy.

Lanner Falcon (SA Status: Vulnerable)

The only other Red List species that was recorded during the first survey was Lanner Falcon, which was recorded during VP watches, transect counts and incidentally while travelling on the site. The passage rate for Lanner Falcons was low at 0.03 birds/hour or roughly from 1 bird every three days. Two individuals were also recorded incidentally.

The National Web-Based Environmental Screening Tool map of the study area, indicating sensitivities for the Terrestrial Animal Species theme. The High classification is linked to Ludwig's Bustard (*Neotis ludwigii*) and the medium sensitivity classification is linked to Ludwig's Bustard (*Neotis ludwigii*) and Verreaux's Eagle (*Aquila verreauxii*).

The SABAP2 data, combined with the result of the monitoring surveys, indicate that a total of 170 bird species could potentially occur within the broader area. Sixty species are classified as solar priority species and 47 as powerline priority species. (see Appendix E for full Avifauna specialist study report). Ten of these are South African Red List species. Of the solar priority species, 28 are likely to occur regularly at the development area. Of the powerline priority species, 26 are likely to occur regularly at the development area.

Pre-construction surveys revealed the following:

The overall abundance of priority species at the project site was low, with an average of 0.70 birds/km recorded during the transect counts. For all birds combined (priority and non-priority species), IKA for transect counts was 18.96 birds/km, which is a moderate abundance. An overall environmental sensitivity map is presented in

The following environmental sensitivities were identified from an avifaunal perspective in the development area:

Surface water: 200/150 m turbine exclusion zone

No turbines (including their rotor swept areas) should be constructed within 200m around water points and 150m from the center line of drainage lines to limit potential collision risk to priority species which are attracted to the surface water. Surface water in this semi-arid habitat is crucially important for priority avifauna, including nocturnal species e.g. Spotted Eagle-Owl, and some non-priority species. It is important to leave open space with no turbines for birds to access and leave the surface water area unhindered.

Verreaux's Eagle nests: 1km all infrastructure exclusion zone

A 1km all infrastructure exclusion zone must be implemented around the Verreaux's Eagle nests at the following localities:

- VE nest 2: -29.761014° 22.724252°

- VE nest 5: -29.821777° 22.767599°
- VE nest 6: -29.785307° 22.742258°
- VE nest 7 & 8: -29.782901° 22.777143°
- VE nest 18 & 19: -29.759758° 22.762227°
- VE nest 12 & 13: -29.830647° 22.774612°
- VE nest 30: -29.838815° 22.816784°
- VE nest 31: -29.835845° 22.817236°

This is to prevent the birds from being displaced from their nest due to disturbance associated with the construction activities at the WEF. Verreaux’s Eagles are classified as regionally Vulnerable (Taylor *et al.* 2015).

See Figure 20 for the avifaunal sensitivities identified in the PAOI.

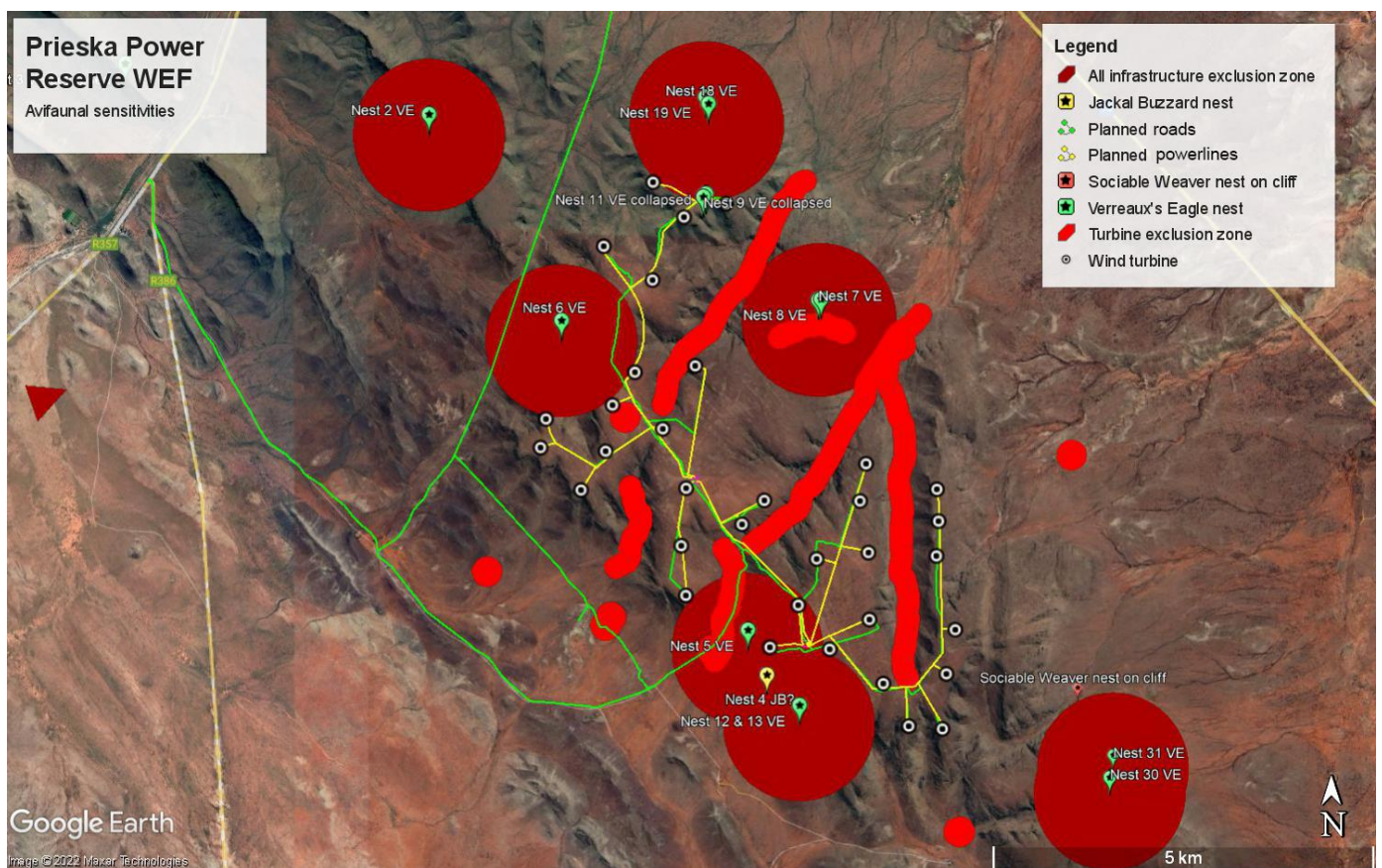


Figure 20: Avifaunal sensitivities identified in the PAOI (Chris van Rooyen Consulting, 2022)

Cumulative effects are commonly understood to be impacts from different projects that combine to result in significant change, which could be larger than the sum of all the individual impacts. The assessment of cumulative effects therefore needs to consider all renewable energy projects within a 30 km radius that have received an EA at the time of starting the environmental impact process, as well as the proposed Prieska Power Reserve WEF project. There are currently six renewable energy projects authorised within a 30 km radius around the proposed WEF. The locality of renewable projects (affected properties) which are authorised are listed in Table 13 and shown in Figure 21.

Table 13: Renewable energy projects that have been approved within a 30km radius around the proposed PV 1 project (Source: Department of Forestry, Fisheries and the Environment).

Project name	Applicant	DAERL 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	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	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, Northern Cape	Mahoebe Eiendomme BPK	14/12/16/3/3/1/1475	Approved
Proposed 75MW IPMS Solar power plant in Prieska, Northern Cape	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	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, Northern Cape	Camel Thorn Solar Power Plant (RF) (Pty) Ltd	14/12/16/3/3/2/937	Approved

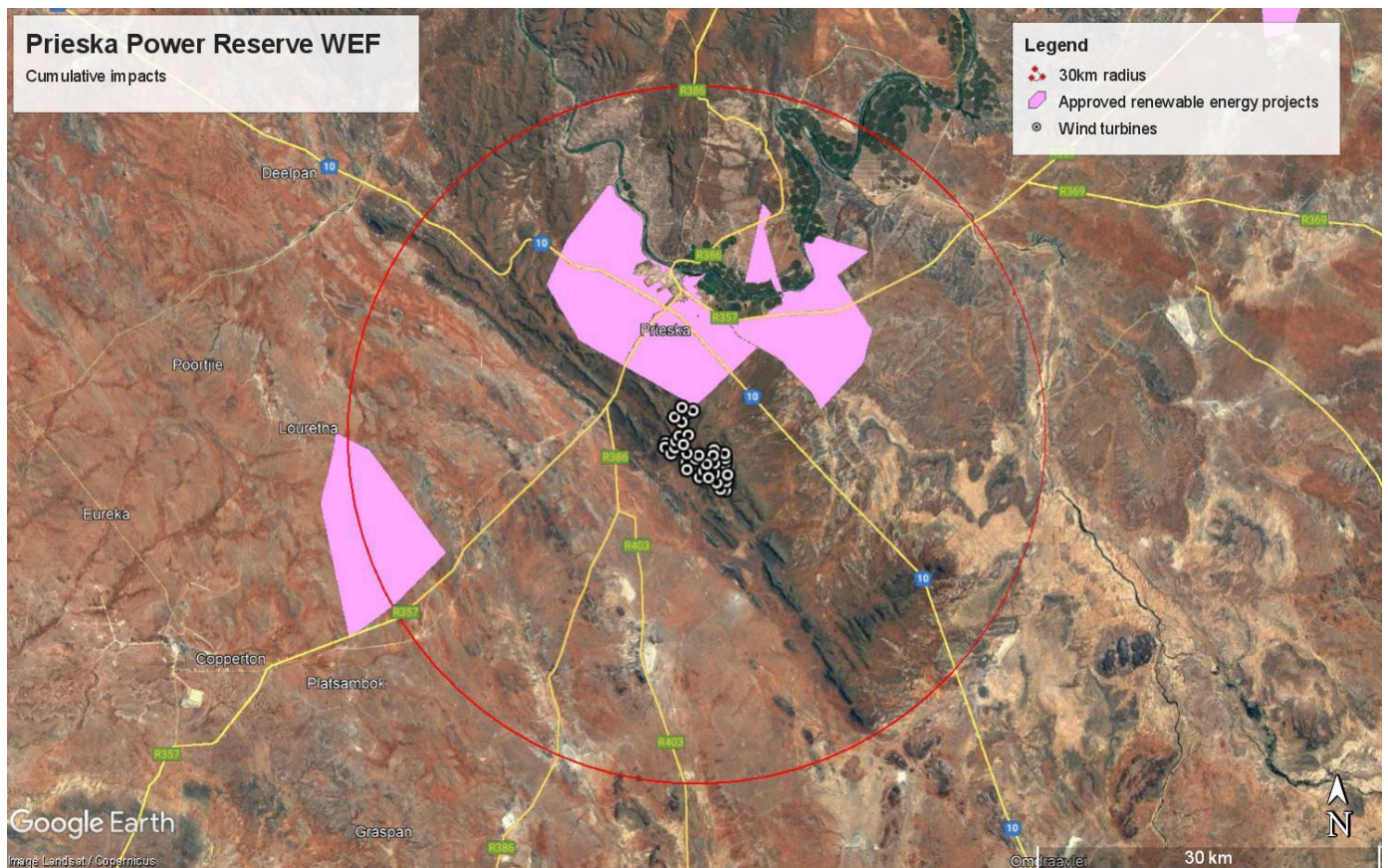


Figure 21: Approved Renewable Energy Projects within a 30km radius around the proposed WEF (Chris van Rooyen Consulting, 2022)

The total affected land parcel area taken up by authorised renewable energy projects within the 30km radius (all solar PV) is approximately 260km², although the actual area affected by the solar facilities is likely to be 20% or less of the land parcel area, i.e. ~52 km². The total area affected by the proposed Prieska Power Reserve WEF project equates to ~10 km². The combined area affected by authorised renewable energy developments within the 30 km radius around the proposed WEF, including the proposed WEF, thus equals ~62 km². Of this, the proposed WEF project constitutes ~16%. The contribution of the proposed WEF to the cumulative impact of the renewable energy projects is thus anticipated to be **medium** after mitigation.

The total area of natural habitat within the 30km radius around the proposed projects equates to about 2 691km² (excluding urban areas and irrigated agriculture). The total combined size of the area potentially affected by renewable energy projects will thus equate to ~2.3% of the available untransformed habitat in the 30km radius, should all the projects be constructed. However, each of these projects must still be subject to a competitive bidding process where only the most competitive projects will win a power purchase agreement required for the project to proceed to construction. The cumulative impact of all the proposed renewable energy projects is thus estimated to affect a maximum of ~2.3% or less of the available untransformed habitat, resulting in a **low** impact.

Heritage

Logistical infrastructure

Combiner Areas North and South

Given their individual size ($\leq 5000 \text{ m}^2$), the Combiner footprints do not trigger any of the listed activities in Section 38 (1) of the NHRA. The sites lie on banded ironstone and a residual soil veneer. There are no indications

of in situ Stone Age sites, historically significant buildings older than 60 years, or aboveground evidence of graves or rock art.

Laydown Area

The 1 ha footprint is located on flat terrain, mantled by a variably sorted gravel and sandy soil matrix on banded ironstone. There is no evidence of in situ Stone Age archaeological material, either as capped assemblages or distributed as intact surface scatters on the landscape, historically significant buildings older than 60 years, or aboveground evidence of graves within the boundary of the site. The site is not considered paleontologically or archaeologically sensitive is assigned a rating of Generally Protected C (Low significance)

Security Corridor

Given its size ($\leq 5000 \text{ m}^2$), the footprint does not trigger any of the listed activities in Section 38 (1) of the NHRA. The site covers an existing road section within a degraded area and is assigned a rating of Generally Protected C (Low significance)

Valley Access Roads

Proposed road network section A B E F G follows an existing track, section B C D runs parallel to existing track and section C F more or less transects undisturbed terrain. Low density distributions of highly weathered and mostly isolated stone tools are primarily confined to ephemeral stream channels and lag deposits along sections B C D and C F. The sections are not considered paleontologically or archaeologically sensitive are each assigned a rating of Generally Protected C (Low significance).

132KV Transmission Line

The 4.37 km - long linear footprint transects undisturbed terrain underlain by Kuruman Formation rocks (banded ironstone) along its mountain plateau section and geologically recent alluvium and gravelly residual soils along the valley floor. Low density distributions of highly weathered and mostly isolated stone tools are primarily confined to ephemeral stream channels and lag deposits. The footprint is not considered paleontologically or archaeologically sensitive. The footprint is assigned a rating of Generally Protected C (Low significance).

Access roads and 33KV electrical network connecting turbines on the Doringberg mountain plateaus

The linear road and electrical networks share a similar geological footprint that is underlain by a variably sorted gravel and sandy soil matrix on banded ironstone. There is no evidence of in situ Stone Age archaeological material, either as capped assemblages or distributed as intact surface scatters on the landscape, historically significant buildings older than 60 years, or aboveground evidence of graves within the boundary of the designated areas. The footprints are not considered paleontologically or archaeologically sensitive is assigned a rating of Generally Protected C (Low significance).

Turbine localities on the Doringberg mountain plateaus

Although each of the turbine footprints covers less than 5000 m^2 , they were evaluated as an extension of the associated linear road and electrical footprints on the mountain plateaus. As with the latter, all the turbine localities are underlain by a variably sorted gravel and sandy soil matrix on banded ironstone. No fossil remains or localities were observed within surface deposits during the survey. There are no indications of in situ Stone Age sites, historically significant buildings older than 60 years, or aboveground evidence of graves or rock art. The turbine localities are not considered paleontologically or archaeologically sensitive. All the turbine localities are assigned a rating of Generally Protected C (Low significance).

5.2.1.2 Socio-Economic Environment

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. 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 14: 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 15: 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)

Land-use patterns

The land use patterns in the area are indicated in Figure 22 below.

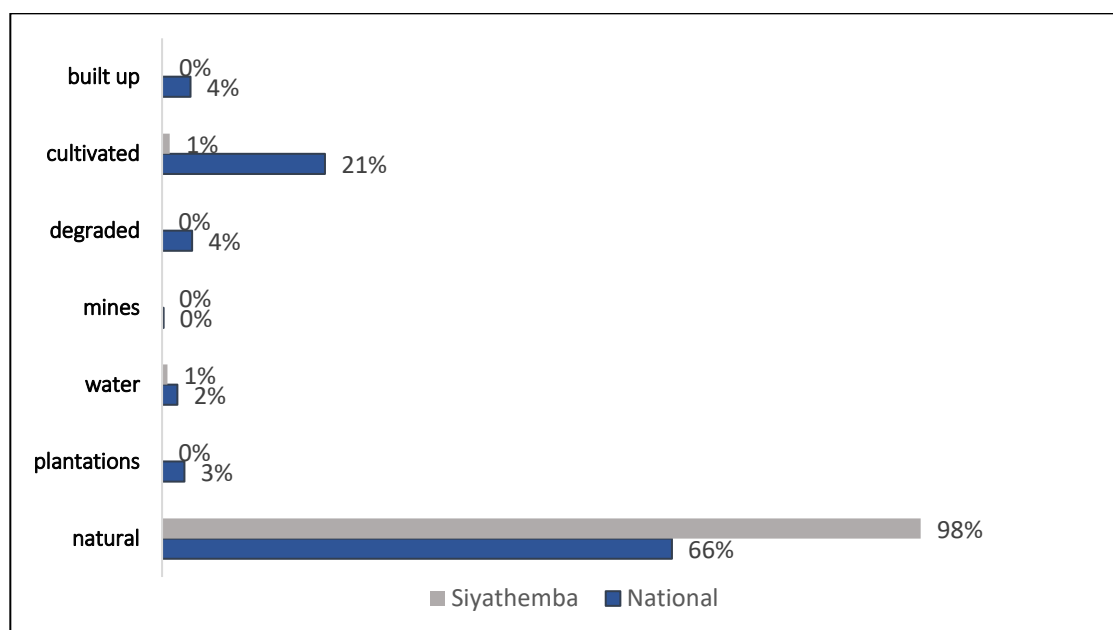


Figure 22: Distribution of Municipal Land, Source: Municipal Demarcation Board, 2018

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. In terms of percentage degraded land, figure 21 could be misleading, vast hectares of land in the Siyathemba Local Municipal area are inundated with invader species due to overgrazing practices.

The withdrawal of degraded agricultural land for the emergence of solar and windfarms would encourage support for a future with large pockets of sheltered land where natural non-human animal populations and more balanced plant populations could recover.

Institutional profile

Basic household services delivery and infrastructure

Table 16 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 16: 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 (Armscor) 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 (Armscor) is responsible for the delivery of water, sanitation, and electricity services. No services are currently being rendered on farms. The Wastewater Treatment (WWT) works in the Niekerkshoop 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 its 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 17: 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 learners per educator (Municipal Demarcation Board, 2018). However according to the Integrated Development Plan (IDP), the Municipality does not experience many 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 in Prieska town; two are farm schools, one is 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).

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).

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).

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 18 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 18: 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).

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).

Local government capacity

The high vacancy rates of senior management at SLM as indicated in Table 19 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 19: 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% +/-) (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

5.3 Economic Profile

5.3.1 Economic activities

The SLM economy provided 5,600 formal job opportunities in 2017 and produced a GVA of R970million (current prices). Table 20 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 20: 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

5.3.2 Labour force

As indicated in Table 21 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 21: 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).

5.3.3 Income levels

As indicated in Table 22 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 22: 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 23 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 23: 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).

5.3.4 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 24: Diversity Indicators, 2017

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

Source: Northern Cape Provincial Treasury, 2019

5.3.5 Natural resource intensity

Table 25 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 25: Resource Efficiency of the Govan Mbeki Municipality, 2017/2019

Area	Energy Efficiency	Water efficiency
	GVA (R)/MWh used	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)

5.4 Public Participation Process

The following sections provide detailed information on the public participation process conducted in terms of Regulations 39 to 44.

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 the then called 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.

5.4.1 General

The public participation process was conducted strictly in accordance with Regulations 39 to 44. The following three categories of variables were taken into account when deciding the required level of public participation:

- The scale of anticipated impacts
- The sensitivity of the affected environment and the degree of controversy of the project
- The characteristics of the potentially affected parties

Since the scale of anticipated impacts is low, the low environmental sensitivity of the site and the fact that no conflict was foreseen between potentially affected parties, no additional public participation mechanisms were considered at this stage of the process. The following actions have already been taken:

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 complied with these legislated requirements relating to public participation.

Table 26: 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 wind facility is attached in Appendix D. The Landowner/s have been automatically registered as interested and affected party and given an opportunity to comment on a draft 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	A draft Scoping report was made available to all I&APs and identified stakeholders for 30 days.

<p>potential or registered interested and affected parties, including the competent authority, a period of at least 30 days to submit comments.</p>	
<p>(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—</p> <p>(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—</p> <p>(i) the site where the activity to which the application or proposed application relates is or is to be undertaken; and</p> <p>(ii) any alternative site;</p>	<p>A Notice board was placed at two positions along the R357 road.</p> <p>Photographic evidence of these notices is attached in Appendix D.</p>
<p>(b) giving written notice, in any of the manners provided for in section 47D of the Act, to—</p> <p>(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;</p> <p>(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;</p> <p>(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;</p> <p>(iv) the municipality which has jurisdiction in the area;</p> <p>(v) any organ of state having jurisdiction in respect of any aspect of the activity; and</p> <p>(vi) any other party as required by the competent authority;</p>	<p>The landowners of the areas proposed for the wind turbine placements welcomed the project to the Prieska area, and confirmed its support. Evidence of this is attached to Appendix D.</p> <p>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.</p> <p>The ward councillor has been notified of this environmental process. Please refer to Appendix D for copies of these notifications.</p> <p>List of organs of state that were notified as part of this environmental process. Please refer to Appendix D for copies of these notifications.</p> <p>DAERL was also given an opportunity to comment on a Draft Scoping Report, comments received by them are included and addressed in a final Report. The final scoping phase was accepted on 21 November 2022.</p>
<p>(c) placing an advertisement in—(i) one local newspaper; or</p> <p>(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;</p> <p>(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—</p> <p>(i) illiteracy;</p>	<p>An advert was placed in the Gemsbok newspaper.</p> <p>There is currently no official Gazette that has been published specifically for the purpose of providing public notice of applications.</p> <p>Notifications have included provision for alternative engagement in the event of illiteracy, disability or any other disadvantage. In such instances, Green-Box Consulting has engaged with such individuals in such a manner as agreed on with the competent</p>

(ii) disability; or (iii) any other disadvantage.	authority. Hard copies of the draft Scoping were placed at the Municipal Offices and public library.
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 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 are listed in a comments and response trail report, with responses to these comments, see Appendix D.

Registration of key stakeholders

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

Notification of availability of the Draft Scoping Report

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

Comments and response on the Draft Scoping Report

All comments received on the draft report were considered, responded to, and included in a Final Scoping Report that was submitted to the authorising authority for decision making. The final Scoping Phase was accepted on the 21st of November 2022. The scoping phase was presented to the following identified parties.

- Provincial Department of Agriculture, Environmental Affairs, Rural Development and Land Reform, Directorate, Biodiversity
- Department of Water and Sanitation
- Department of Forestry, Fisheries and Environment (DAERL)
- National Department of Agriculture, Forestry and Fisheries (DAFF)
- National Energy Regulator of South Africa
- Department of Transport, Roads and Public Works

- South African National Roads Agency Limited - Northern Cape (Western Region)
- Department of Social Development, NC
- Northern Cape Provincial Heritage Resources Authority
- South African Civilian Aviation Authority
- ESKOM
- Department of Science and Technology, SKA SA
- Department of Energy Northern Cape
- South African Heritage Resources Agency
- Department of Mineral Resources
- SALGA, environmental manager
- SENTECH
- Siyathemba Local Municipality
- Pixley Ka Seme District Municipality
- Birdlife South Africa
- Independent Communications Authority of South Africa (ICASA)
- Surrounding landowners

Circulation of this Draft Environmental Impact Assessment Report is done and will run from 22 November 2022 to 14 December 2022 and again from 06 to 12 January 2023.

All comments received within this period will be included a finalised EIR.

6 DESCRIPTION OF THE IMPACTS AND RISKS

6.1 Approach to undertaking the EIA

The contents and methodology of the Environmental Impact report aimed to provide, as far as possible, a user-friendly analysis of information to allow for easy interpretation.

- Checklist: The checklist consists of a list of structured questions related to the environmental parameters and specific human actions. They assist in ordering thinking, data collection, presentation, and alert against the omission of possible impacts.
- Matrix: The matrix analysis provides a holistic indication of the relationship and interaction between the various activities, development phases and the impact thereof on the environment. The method aims at providing a first order cause and effect relationship between the environment and the proposed activity. The matrix is designed to indicate the relationship between the different stressors and receptors which leads to specific impacts. The matrix also indicates the specialist studies that have been conducted to address the potentially most significant impacts.

Checklist analysis

Table 27 provides a checklist, which is designed to stimulate thought regarding possible consequences of specific actions and so assist scoping of key issues. It consists of a list of structured questions related to the environmental parameters and specific human actions.

They assist in ordering thinking, data collection, presentation, and alert against the omission of possible impacts. The table highlights certain issues.

Table 27: Environmental checklist

Question	Yes	No	Unsure	Description
1. Are any of the following located on the site earmarked for the development?				
A river, stream, dam or wetland		x		Drainage lines applicable
A conservation or open space area		x		None
Site of geological significance		x		None
Areas of outstanding natural beauty		x		None
Highly productive agricultural land		x		None
Floodplain		x		None
Indigenous forest		x		None
Grass land		x		None
Bird nesting sites	x			The Avifaunal Study
Red data species	x			The Avifaunal Study
Tourist resort		x		None
2. Will the project potentially result in potential?				
Removal of people		x		None
Visual Impacts	x			Visual Impact Study
Noise pollution		x		None
Construction of an access road	x			Access will be obtained via the R357 road
Risk to human or valuable ecosystems due to explosion/fire/ discharge of waste into water or air.		x		None

Accumulation of large workforce (>50 manual workers) into the site.	x			Approximately 240 employment opportunities will be created during the construction phase of the project.
Utilisation of significant volumes of local raw materials such as water, wood etc.	x			Water use during the construction phase.
Job creation	x			Approximately 240 employment opportunities will be created during the construction and 30 during operational phases.
Traffic generation	x			Construction phase traffic trips will be generated.
Soil erosion		x		None
Installation of additional bulk electricity transmission lines or facilities	x			A 132kV transmission line will be constructed.
3. Is the proposed project located near the following?				
A river, stream, dam or wetland	x			The Ecological assessment identified drainage lines
A conservation or open space area		x		None
Site of geological significance		x		None
Areas of outstanding natural beauty		x		None
Highly productive agricultural land		x		None
A tourist resort		x		None
A formal or informal settlement		x		None

Matrix analysis

The matrix describes the relevant listed activities, the aspects of the development that will apply to the specific listed activity, a description of the environmental issues and potential impacts, the significance and magnitude of the potential impacts and possible mitigation measures. The matrix also highlights areas of particular concern (see Table 28) for more in-depth assessment during the EIA process. An indication is provided of the specialist studies conducted and which informed the initial assessment. Each cell is evaluated individually in terms of the nature of the impact, duration and its significance – should no mitigation measures be applied. This is important since many impacts would not be considered insignificant if proper mitigation measures were implemented.

In order to conceptualise the different impacts, the matrix specify the following:

- Stressor: Indicates the aspect of the proposed activity, which initiates and cause impacts on elements of the environment.
- Receptor: Highlights the recipient and most important components of the environment affected by the stressor.
- Impacts: Indicates the net result of the cause-effect between the stressor and receptor.
- Mitigation: Impacts need to be mitigated to minimise the effect on the environment.

Please see below for a more in-depth assessment of the potential environmental impacts.

For ease of reference the significance of the impacts is colour-coded as follow:

Low significance	Medium significance	High significance	Positive impact
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ASPECTS OF THE DEVELOPMENT /ACTIVITY	POTENTIAL IMPACTS		SIGNIFICANCE AND MAGNITUDE OF POTENTIAL IMPACTS							MITIGATION OF POTENTIAL IMPACTS		SPECIALIST STUDIES / INFORMATION
	Receptors	Impact description / consequence	Minor	Major	Extent	Duration	Probability	Reversibility	Irreplaceable loss of resources	Possible mitigation	Possible mitigation measure	
CONSTRUCTION PHASE												
<p><u>Site clearing and preparation</u></p> <p>Certain areas of the site will need to be cleared of vegetation and some areas may need to be levelled.</p> <p><u>Civil works</u></p> <p>The main civil works are:</p> <ul style="list-style-type: none"> - Terrain levelling if necessary– Levelling will be minimal as the sites chosen is relatively flat. - Laying foundation- The turbine structures will be connected to the ground through concrete pillars, cement slabs or metal structures. - Construction of access and inside roads/paths – existing paths will be used where reasonably possible. - Additionally, the turning of vehicles are taken into consideration. - Trenching – all 33kV lines. Trenches will have a river sand base, space for pipes, backfill of sifted soil and soft sand and concrete layer where vehicles will pass at steep angles. - Construction of the 132kV line within an existing Eskom servitude. <p><u>Transportation and installation of turbine structures</u></p>	<p>Biodiversity Terrestrial</p> <ul style="list-style-type: none"> o Loss or fragmentation of habitat for faunal and floral species. o Loss of indigenous faunal and floral species diversity. o Loss of faunal and floral species of conservation significance. 		-	L	L	D	PR	ML	YES	<ul style="list-style-type: none"> - Site clearing must take place in a phased manner, as and when required. - The footprint associated with the construction related activities (access roads, construction platforms, workshop etc.) should be confined to the fenced off area and minimised where possible. - No trapping or snaring to fauna on the construction site should be allowed. - Also refer to the mitigation measures listed in the Ecological Fauna and Flora Habitat Survey & Avifaunal Study. 	L	Ecological Assessment Study & Avifaunal Study.
	<p>Biodiversity Avifauna</p> <ul style="list-style-type: none"> o Disturbance by construction and maintenance activities. o Displacement through habitat removal and construction work. o Direct collision with turbine blades 		-	L	L	PR	PR	ML	YES	<ul style="list-style-type: none"> - Construction activity should be restricted to the immediate footprint of the infrastructure as far as possible, and in particular to the proposed road network. Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. - Construction of new roads should only be considered if existing roads cannot be upgraded. - Vehicle and pedestrian access to the site should be controlled and restricted as much as possible to prevent unnecessary disturbance of priority species. - No construction activity should take place within 1km of any Verreaux's Eagle nests, except if there is already an existing road, and avoiding the 1km buffer would result in the construction of a new road. In the latter instance, construction activities should ideally take place outside the breeding season i.e. from November to March. 	L	Avifaunal Study.

<p>The turbine parts will be transported from the factory to the site on trucks. The parts will be placed at a laydown area from where it will be transported up the mountain for installation.</p>	<p><u>Biodiversity</u> Soil</p> <ul style="list-style-type: none"> ○ Loss of topsoil in disturbed areas, causing a decline in soil fertility. ○ Soil erosion caused by alteration of the surface characteristics. 	-		S	S	D	CR	NL	YES	<p>-Areas which are not to be constructed on within two months must not be cleared to reduce erosion risks.</p> <p>- The necessary silt fences and erosion control measures must be implemented in areas where these risks are more prevalent.</p> <p>- Vehicles and equipment shall be serviced regularly to avoid the contamination of soil from oil and hydraulic fluid leaks etc.</p>	M	
	<p><u>Biodiversity</u> Existing services infrastructure</p> <ul style="list-style-type: none"> ○ The use of water. ○ Generation of waste that needs to be accommodated at a licensed landfill site. 	-		L	S	D	PR	ML	YES	<p>-All construction waste must be managed through formal disposal processes and be disposed of at appropriate licensed landfill sites.</p>	L	Confirmation from the Local Municipality on use of their municipal waste site.
	<p><u>Biodiversity</u> Surface water</p> <ul style="list-style-type: none"> ○ Increase in storm water runoff. ○ Pollution of water sources due to soil erosion. 	-		S	S	PR	BR	ML	YES	<p>- Silt fences should be used to prevent any soil entering the storm water drains.</p> <p>- New storm water construction must be developed strictly according to specifications from engineers in order to ensure efficiency.</p> <p>- Any hazardous substances must be stored at least 200m from any of the drainage lines on site.</p> <p>- Also refer to the mitigation measures listed in the Ecological Assessment Study.</p>	L	Ecological Assessment Study
	<p><u>Socio-economic environment</u> Local unemployment rate</p> <ul style="list-style-type: none"> ○ The creation of local employment and business opportunities, skills development and training. ○ The maximising of opportunities to local and regional SMMEs and other business for service delivery. ○ Technical support to local farmers and municipalities. 	+		P	S	D	I	N/A	YES	<p>Where reasonable and practical, service providers should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories.</p>	L	Social Impact Assessment
	<p><u>Socio-economic environment</u> Visual</p> <ul style="list-style-type: none"> ○ Potential visual impact on residents of farmsteads and surrounding settlements and motorists in close proximity to proposed facility. 	-		L	S	D	PR	NL	YES	<p>Dust suppression will play an important role to minimise the visibility of dust.</p> <p>- Contractors must avoid using roads not relevant to the project.</p> <p>- Good housekeeping should be implemented.</p> <p>- Proper rehabilitation of disturbed areas.</p>	L	-
	<p><u>Socio-economic environment</u> Traffic</p> <ul style="list-style-type: none"> ○ Increase in construction vehicles on existing roads. 	-		P	S	PR	CR	NL	YES	<p>The development may not commence without influencing the levels-of service for the local road network.</p>	L	-

	<u>Socio-economic environment</u> Health and Safety	<ul style="list-style-type: none"> ○ Air/dust pollution. ○ Road safety. ○ The in-migration or potential influx of job seekers that potentially might have impacts on family structures, communities, social networks and basic community services. ○ The presence of construction workers on-site and in the communities. ○ Safety risk of farmers, risk of livestock theft and theft of farming infrastructure. ○ Potential impact of heavy vehicles and construction related activities, damage to roads and dust pollution. ○ The potential risk of veld fires. 	-		L	S	PR	PR	ML	YES	<ul style="list-style-type: none"> - Contractor to ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. - It is recommended that no construction workers with the exception of security personnel, should be permitted to stay over-night on the site. - Also refer to the mitigation measures listed in the Social Impact Assessment 	L	Social Impact Assessment
	<u>Socio-economic environment</u> Noise levels	<ul style="list-style-type: none"> ○ The generation of noise as a result of construction vehicles, the use of machinery such as drills and people working on the site. 	-		L	S	D	CR	NL	YES	<ul style="list-style-type: none"> - During construction care should be taken to ensure that noise from construction vehicles and plant equipment does not intrude on the surrounding residential areas. - Plant equipment such as generators, compressors, concrete mixers as well as vehicles should be kept in good operating order and where appropriate have effective exhaust mufflers. 	L	-
	<u>Socio-economic environment</u> Heritage resources	<ul style="list-style-type: none"> ○ No potential cultural or heritage resources were identified on or around the site. 	-		S	S	PO	I	ML	YES	<ul style="list-style-type: none"> - Any discovered artefacts shall not be removed under any circumstances. - Any destruction of a site can only be allowed once a permit is obtained, and the site has been mapped and noted. - Permits shall be obtained from the SAHRA should the proposed site affect any world heritage sites or if any heritage sites are to be destroyed or altered. 	L	Heritage Impact Assessment & Palaeontological and Archaeological Assessment
OPERATIONAL PHASE													
The key components of the proposed project are described below: <u>Turbine placement</u> - To produce 240MW, the proposed facility will require 33 turbine structures, with its associated electricity distribution networks. <u>Roads</u> – Access will be obtained via the R357 provincial road. An internal site road network will also be used to	<u>Biodiversity</u> Terrestrial	<ul style="list-style-type: none"> ○ Loss or fragmentation of habitat for faunal and floral species. ○ Loss of indigenous faunal and floral species diversity. ○ Loss of faunal and floral species of conservation significance. 	-		S	L	PR	ML	YES	<ul style="list-style-type: none"> - Indigenous vegetation must be maintained and all exotics removed as they appear and disposed of appropriately. - Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to construction. - Implement an Avifauna Monitoring Plan. - Also refer to the mitigation measures listed in the Ecological Habitat Survey & Avifaunal Study. 	L	Ecological Assessment Study & Avifaunal Study.	

<p>provide access to the turbine locations and associated infrastructure. All site roads will be upgraded and constructed as a 7meter wide gravel road.</p> <p>Fencing - For health, safety and security reasons, the facility will be required to be fenced off.</p>	<u>Biodiversity</u> Soil	<ul style="list-style-type: none"> Loss of agricultural land use caused by direct occupation of land by the energy facility footprint. Loss of topsoil in disturbed areas, causing a decline in soil fertility. Soil erosion caused by alteration of the surface characteristics. 	-	L	L	D	PR	ML	YES	-An effective system of run-off control should be implemented, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. - Another important measure is to avoid stripping land surfaces of existing vegetation by only allowing vehicles to travel on existing roads and not create new roads.	L	Ecological Assessment Study
	<u>Biodiversity</u> Services infrastructure	<ul style="list-style-type: none"> Generation of waste that need to be accommodated at a licensed landfill site. 	-	P	L	D	I	ML	YES	Waste must be accommodated at a licensed landfill site. - Water saving devices will be implemented	L	Confirmation from the Local Municipality
	<u>Biodiversity</u> Surface water	<ul style="list-style-type: none"> Increase in storm water runoff. The development will potentially result in an increase in storm water runoff that needs to be managed to prevent soil erosion. 	-	L	L	PR	PR	ML	YES	- The storm water management plan must include the construction of appropriate design measures that allow surface and subsurface movement of water along drainage lines so as not to impede natural surface and subsurface flows.	L	Ecological Assessment Study
	<u>Socio-economic environment</u> Social dimension	<ul style="list-style-type: none"> The creation of local employment, business opportunities, and opportunities for skills development and on-site training. The potential up- and downstream economic opportunities for the impacted community. The establishment or renewable energy infrastructure and the generation of clean renewable energy. The generation of additional land use income for landowners. The potential positive impacts associated with the establishment of a Community Trust 	+	L	L	D	I	N/A	YES	- Where reasonable and practical, service providers should implement a 'locals first' policy, especially for semi and low-skilled job categories.	N/A	Social Impact Assessment
	<u>Socio-economic environment</u> Visual landscape	<ul style="list-style-type: none"> Change in land-use/sense of place. The site is characterized by open veldt with a rural agricultural sense of place. Potential visual impact on residents of farmsteads and travellers in close proximity to proposed facility. 	-	L	L	D	PR	ML	YES	- Security lighting should make use of down-lights to minimise light spill, and motion detectors where possible so that lighting at night is minimised. - Care should be taken with the layout of the security lights to prevent motorists on the dirt road from being blinded by lights at the approach to the site.	L	-

	<u>Socio-economic environment</u> Traffic volumes	○ The proposed development will not result in any traffic impacts during the operational phase.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	N/A	-
	<u>Socio-economic environment</u> Noise levels	○ The proposed development will not result in any noise pollution during the operational phase.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	N/A	-
	<u>Socio-economic environment</u> Heritage resources	○ It is not foreseen that the proposed activity will impact on heritage resources or vice versa.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	N/A	Heritage & Palaeontological and Archaeological Impact Assessment
DECOMMISSIONING PHASE														
<u>Dismantling of infrastructure</u> During the decommissioning phase the Wind Energy Facility and its associated infrastructure will be dismantled. <u>Rehabilitation of biophysical environment</u> The biophysical environment will be rehabilitated.	<u>Biodiversity environment</u> Terrestrial	○ Re-vegetation of exposed soil surfaces to ensure no erosion in these areas.		+	S	L	PO	N/A	N/A	YES	Re-vegetation of affected areas must be made a priority to avoid erosion.	N/A	-	
	<u>Biodiversity environment</u> Air quality	○ Air pollution due to the increase of traffic of construction vehicles.	-		S	S	D	CR	NL	YES	Regular maintenance of equipment to ensure reduced exhaust emissions.	L	-	
	<u>Biodiversity environment</u> Soil	○ Soil degradation, including erosion. Disturbance of soils and existing land use (soil compaction). ○ Physical and chemical degradation of the soils by construction vehicles (hydrocarbon spills).		-	S	S	PR	PR	M	YES	Re-vegetation of affected areas must be made a priority to avoid erosion.	M	Ecological Impact Assessment Study	
	<u>Biodiversity environment</u> Services infrastructure	○ Generation of waste that need to be accommodated at a licensed landfill site. ○ Increase in construction vehicles.		-	L	S	D	I	NL	YES	-	L	-	

	<u>Biodiversity environment</u> Surface water	<ul style="list-style-type: none"> ○ Increase in storm water runoff. ○ Pollution of water sources due to soil erosion. 	-		L	S	PR	PR	ML	YES	Removal of any historically contaminated soil as hazardous waste. - Removal of hydrocarbons and other hazardous substances by a suitable contractor to reduce contamination risks. - Removal of all substances which can result in groundwater (or surface water) contamination.	M	-
	<u>Socio-economic environment</u> Local Unemployment rate	<ul style="list-style-type: none"> ○ The loss of employment opportunities and associated income. 	-		L	L	PO	PR	NL	YES	- Developer should ensure that retrenchment packages are provided for all staff retrenched when the facility is decommissioned.	L	Social Impact Assessment
	<u>Socio-economic environment</u> Visual landscape	<ul style="list-style-type: none"> ○ Potential visual impact on visual receptors in close proximity to proposed facility. 	-		L	S	D	CR	NL	YES	Locate laydown and storage areas in zones of low visibility i.e. behind tall trees or in lower lying areas.	L	-
	<u>Socio-economic environment</u> Traffic volumes	<ul style="list-style-type: none"> ○ Increase in construction vehicles. 	-		L	S	PR	CR	NL	YES	Movement of heavy construction vehicles through residential areas should be timed to avoid peak morning and evening traffic periods. - In addition, movement of heavy construction vehicles through residential areas should not take place over weekends.	L	-
	<u>Socio-economic environment</u> Noise levels	<ul style="list-style-type: none"> ○ The generation of noise as a result of construction vehicles, the use of machinery and people working on the site. 	-		L	S	D	CR	NL	YES	The decommissioning phase must aim to adhere to the relevant noise regulations and limit noise to within standard working hours in order to reduce disturbance of dwellings in close proximity to the development.	L	-
	<u>Socio-economic environment</u> Heritage resources	<ul style="list-style-type: none"> ○ It is not foreseen that the decommissioning phase will impact on any heritage resources. 	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	N/A	-

Nature of impact	N/A – No impact	(+) Positive Impact	(-) Negative Impact	
Geographical extent	(S) Site	(L) Local/District	(P) Province/Region	(I) International and National
Probability	(S) Unlikely	(Po) Possible	(Pr) Probable	(D) Definite
Duration	(S) Short Term	(M) Medium Term	(L) Long Term	(P) Permanent
Intensity/Magnitude	(L) Low	(M) Medium	(H) High	(VH) Very High
Reversibility	(CR) Completely Reversible	(PR) Partly Reversible	(BR) Barely Reversible	-
Irreplicable loss of resource	(IR) Irreversible	(NL) No Loss	(ML) Marginal Loss	(SL) Significant Loss
Level of residual risk	(L) Low	(M) Medium	(H) High	(VH) Very High
				(CL) Complete Loss
				-

Table 28: Environmental Impact Matrix

6.2 Key issues identified

From the above it is evident that mitigation measures should be available for potential impacts associated with the proposed activity and development phases. The scoping methodology identified the following key issues which should be addressed in more detail in this EIA report.

6.2.1 Impact during the construction phase

During the construction phase the following activities will have various potential impacts on the biophysical and socio-economic environment:

Transportation:

- Vehicle trips on-site;
- Additional trips on the R357;

Noise:

Noise pollution stemming
from construction activities

Socio-Economic

- Influx of people
- Employment opportunities
- Impact on surrounding landowners associated with the presence of workers
- Project expenditure and new economic opportunities
- Project expenditure and long-term diversification of the economy

Heritage

- Any activities occurring outside of authorised footprint
- Destruction or disturbance of palaeontological materials

Visual

- Effect of construction activities

Watercourses

- Physical disturbance and destruction of dry and ephemeral watercourses (incl. drainage lines)
- Altered drainage patterns, increased runoff, erosion and sedimentation of surrounding ecosystems

Bats

- Excessive noise, dust and blasting

Birds

- Noise and disturbance from construction activities
- Clearing of vegetation

Terrestrial

- Habitat Loss
- Disturbance

During the construction phase minor negative impacts are foreseen over the short term. The latter refers to a period of months. The potentially most significant impacts relate to the impacts on the fauna and flora, avifauna, soils, existing services infrastructure, traffic impacts, socio-economic impacts such as the provision of temporary employment and other economic benefits, and the impacts on health and safety and heritage resources.

6.2.2 Impact during the operational phase

During the operational phase the study area will serve as a Wind Energy Facility. The potential impacts will take place over a period of 20 – 30 years. The negative impacts are generally associated with impacts on the fauna and flora, avifauna, soils, the pressure on existing services infrastructure and visual impacts. The operational phase will have a direct positive impact through the provision of employment opportunities for its duration, and the generation of income to the local community.

6.2.3 Impacts during the decommissioning phase

The physical environment will benefit from the closure of the wind facility since the site will be restored to its natural state. The decommissioning phase will however potentially result in impact on soils, surface water and the loss of permanent employment. Skilled staff will be eminently employable, and a number of temporary jobs will also be created in the process.

6.3 Aspects to be assessed

Table 29 below provides a summary of the aspects that need to be assessed as part of the EIR. The aspects are also linked to specialist information that has been obtained. Refer to Table 28 for a description of the potential impacts.

Table 29: Aspects to be assessed

Aspect	Potential Impact	Specialist Studies / technical information
Construction of turbine facility and associated electricity transmission infrastructure	Terrestrial impacts	Ecological Impact Assessment & Avifauna study
	Impacts on local services	EAP assessment
	Impacts on local employment	Social Impact Assessment
	Impacts on heritage resources	Heritage & Palaeontological & Archaeological Impact Assessment
	Impact on traffic	EAP assessment
	Socio-economic impacts	Social Impact Assessment
Operation of the Wind Energy Facility	Terrestrial impacts	Ecological Impact Assessment & Avifauna study
	Impacts on services	EAP assessment
	Visual impacts	Visual Impact Assessment
	Impacts on local employment	Social Impact Assessment
	Impacts on heritage resources	Heritage & Palaeontological & Archaeological Impact Assessment
	Provision of employment & generation of income for the local community	Social Impact Assessment
Decommissioning of the facility	Impacts on soil	Ecological Impact Assessment
	Impacts on heritage resources	Heritage & Palaeontological & Archaeological Impact Assessment
	Socio-economic impacts	Social Impact Assessment
Cumulative impacts	Cumulative biophysical impacts resulting from similar developments in close proximity to the proposed activity.	EAP assessment & Specialist Assessment (All specialists)

6.4 Summary of recommendations from Specialist Studies

To address the key issues highlighted in the previous section the following specialist studies and processes were commissioned:

SPECIALISTS		
Mr. Rikus Lamprecht	Eco Focus	Ecological Impact Assessment, including terrestrial and surface water
Dr. Lloyd Rossouw	Paleo Field Services	Heritage Impact Assessment (Archaeology, Palaeontology and Cultural Landscape)
Mr. Chris van Rooyen	Chris van Rooyen Consulting	Avifauna Impact Assessment
Ms. An Kritzinger	SED Southern Economic Development	Socio-Economic Impact Assessment
Mr. Wian Esterhuizen	CLJBL Services	Visual Impact Assessment

The following sections summarise the main findings from the specialist reports in relation to the key issues raised during the scoping phase.

Ecological Impact Assessment:

The mountaintop plateaus as well as the flat bottomland areas and transitional zone surrounding the mountain range, both scored moderate Ecological Importance and Sensitivity (EIS) values and are therefore viewed as being of moderate conservational significance/value for habitat preservation and ecological functionality persistence in support of the surrounding ecosystem, broader vegetation type, Ecological Support Area (ESA), nationally- and provincially protected species individuals and the ecological functionality and -integrity of the local and broader quaternary surface water catchment- and drainage area.

The mechanical clearance associated with the proposed development, will in all probability completely transform the majority of the existing surface vegetation throughout all the different footprint areas, associated with the mountaintop plateaus as well as the flat bottomland areas and transitional zone surrounding the mountain range. The combined total size of all these different proposed footprint areas, is however minute relative to the landscape surrounding them. The small wind turbine laydown areas are also spread-out and spaced far apart throughout the mountaintop plateaus. The local and broader region surrounding the assessment areas furthermore constitutes a vast, continuous undeveloped natural landscape. The applicant also intends to establish and manage the three mountaintop plateaus as an eco-friendly wildlife camp. It is consequently not anticipated that the proposed development would necessarily pose any significant risk to achieving and maintaining national and/or provincial conservation and persistence targets of the area or to the continued ecological functionality and -integrity of the local and broader surrounding landscape.

Destruction of-/damage to Red Data Listed, nationally- and/or provincially protected species individuals/habitats associated with the assessment area, terrestrial and aquatic alien invasive species establishment throughout the flat bottomland areas and transitional zone surrounding the mountain range as well as impeding and contamination of the flow regimes of the numerous watercourses and water drainage lines/preferential flow paths, within the associated local and broader quaternary surface water catchment- and drainage area, were identified and addressed as significant potential long-term ecological impact, associated with the construction phase of the proposed development.

Continued impeding and contamination of the flow regimes of the numerous watercourses and water drainage lines/preferential flow paths, within the associated local and broader quaternary surface water catchment- and drainage area was furthermore identified and addressed as a continued significant potential long-term ecological impact, associated with the operational phase of the proposed development.

Although the broader region surrounding the assessment area constitutes a vast, continuous undeveloped natural landscape, the proposed development merely forms a small part of the first phase of a significantly sized and extensive renewable energy power generating hub, which is envisaged for the broader area to the south of the town of Prieska, over time. Significant future development expansion and subsequent transformation in the same geographical area, which could likely lead to further cumulative ecological impacts, will therefore in all probability take place within the local and broader area, over time.

The significant potential long-term ecological impacts identified for the proposed development, could therefore potentially add moderate cumulative impact to the existing and anticipated future negative impacts, associated with the envisaged significantly sized and extensive renewable energy power generating hub, over time.

It is however the opinion of the specialist, by application of the NEMA Mitigation Hierarchy, that all the identified potential cumulative ecological impacts associated with the proposed development, can be suitably reduced and mitigated to within acceptable residual levels, by implementation of the recommended mitigation measures. It is therefore not anticipated that the proposed development will add any significant residual cumulative ecological impacts to the surrounding environment, if all recommended mitigation measures as per this ecological report are adequately implemented and managed, for both the construction- and operational phases of the proposed development.

It is the opinion of the specialist that the proposed development of the assessment areas should be considered by the competent authority, for Environmental Authorisation and approval. All recommended mitigation measures as per this ecological report must however be adequately implemented and managed for both the construction and operational phases of the proposed development. All necessary authorisations, permits and licenses must also be obtained prior to the commencement of any construction.

Construction Phase Impacts Significance:

	Three mountaintop plateau assessment areas	Flat bottomland and transitional zone assessment areas
Identified Environmental Impact	Transformation of vegetation within the assessment areas associated with the Lower Gariep Broken Veld (NKB 1) and Bushmanland Arid Grassland (NKB 3) vegetation types	
Magnitude of Negative or Positive Impact	Low (4)	Very low (2)
Duration of Negative or Positive Impact	Long term (4)	Long term (4)
Extent of Positive or Negative Impact	Local (2)	Local (2)
Irreplaceability of Natural Resources being impacted upon	Low (2)	Low (2)
Reversibility of Impact	Low (4)	Low (4)
Probability of Impact Occurrence	Medium (3)	Medium (3)
Cumulative Impact Rating prior to mitigation	Low	Low
Environmental Significance Score and Rating prior to mitigation	Low (48)	Low (42)

Mitigation Measures to be implemented	<p>The proposed development construction footprints must be kept as small as practicably possible to reduce the surface impact on surrounding vegetation and no unnecessary/unauthorised footprint expansion into the local or broader natural landscape surrounding the assessment areas, may take place.</p> <p>Vegetation clearance must be restricted to the narrow linear sections of the proposed wind turbine access/service road routes as well as the proposed 33 kV transmission line network access/service road routes, as far as practicably possible.</p> <p>Vegetation clearance must be restricted to the narrow linear sections of the proposed main site access/service road route as well as the proposed 132 kV transmission line access/service road route, as far as practicably possible.</p> <p>No site construction basecamps may be established within the local or broader natural landscape surrounding the assessment areas.</p> <p>Adequately cordon off the proposed development construction footprint area and ensure that no construction activities, -machinery or -equipment operate or impact within the local or broader surrounding natural landscape outside the cordoned off area.</p> <p>Adequate operational procedures for construction machinery and equipment must be developed in order to strictly govern and restrict movement of machinery only within the proposed development construction footprint areas and to ensure environmentally responsible construction practices and activities.</p>
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	<p>Existing roads and farm tracks in close proximity to the proposed development construction footprint areas, must be used during the construction phase. No new temporary roads or tracks may be constructed or implemented through the local or broader natural landscape surrounding the assessment areas.</p> <p>Disturbed areas within and immediately surrounding the proposed development footprint areas must be adequately rehabilitated as soon as practicably possible after construction. A Rehabilitation Management Plan must be compiled by a suitably qualified and experienced ecologist.</p> <p>It is recommended that a sufficient grazing management plan and practices must be implemented for livestock of the local farmers/land users, in order to prevent continued significant overgrazing of the landscape and to attempt to improve/restore the ecological condition, over time.</p> <p>It is also recommended that a sufficient game management plan and practices must be implemented for the proposed wildlife camp, in order to adequately manage the camp and to attempt to improve/restore the ecological condition, over time. The Game Management Plan must be compiled by a suitably qualified and experienced ecologist.</p>	
Cumulative Impact Rating after mitigation implementation	Low	Low
Environmental Significance Score and Rating after mitigation implementation	Low (45)	Low (26)

	Three mountaintop plateau assessment areas	Flat bottomland and transitional zone assessment areas
Identified Environmental Impact	Transformation of an Ecological Support Area (ESA) associated with the assessment areas	
Magnitude of Negative or Positive Impact	Low (4)	Very low (2)
Duration of Negative or Positive Impact	Long term (4)	Long term (4)
Extent of Positive or Negative Impact	Local (2)	Local (2)
Irreplaceability of Natural Resources being impacted upon	Low (2)	Low (2)
Reversibility of Impact	Low (4)	Low (4)
Probability of Impact Occurrence	Medium (3)	Medium (3)
Cumulative Impact Rating prior to mitigation	Low	Low
Environmental Significance Score and Rating prior to mitigation	Low (48)	Low (42)

Mitigation Measures to be implemented	<p>The proposed development construction footprints must be kept as small as practicably possible to reduce the surface impact on surrounding vegetation and no unnecessary/unauthorised footprint expansion into the local or broader natural landscape surrounding the assessment areas, may take place.</p> <p>Vegetation clearance must be restricted to the narrow linear sections of the proposed wind turbine access/service road routes as well as the proposed 33 kV transmission line network access/service road routes, as far as practicably possible.</p> <p>Vegetation clearance must be restricted to the narrow linear sections of the proposed main site access/service road route as well as the proposed 132 kV transmission line access/service road route, as far as practicably possible.</p> <p>No site construction basecamps may be established within the local or broader natural landscape surrounding the assessment areas.</p> <p>Adequately cordon off the proposed development construction footprint area and ensure that no construction activities, -machinery or -equipment operate or impact within the local or broader surrounding natural landscape outside the cordoned off area.</p> <p>Adequate operational procedures for construction machinery and equipment must be developed in order to strictly govern and restrict movement of machinery only within the proposed development construction footprint areas and to ensure environmentally responsible construction practices and activities.</p>
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	<p>Existing roads and farm tracks in close proximity to the proposed development construction footprint areas, must be used during the construction phase. No new temporary roads or tracks may be constructed or implemented through the local or broader natural landscape surrounding the assessment areas.</p> <p>Disturbed areas within and immediately surrounding the proposed development footprint areas must be adequately rehabilitated as soon as practicably possible after construction. A Rehabilitation Management Plan must be compiled by a suitably qualified and experienced ecologist.</p> <p>It is recommended that a sufficient grazing management plan and practices must be implemented for livestock of the local farmers/land users, in order to prevent continued significant overgrazing of the landscape and to attempt to improve/restore the ecological condition, over time.</p> <p>It is also recommended that a sufficient game management plan and practices must be implemented for the proposed wildlife camp, in order to adequately manage the camp and to attempt to improve/restore the ecological condition, over time. The Game Management Plan must be compiled by a suitably qualified and experienced ecologist.</p>	
Cumulative Impact Rating after mitigation implementation	Low	Low
Environmental Significance Score and Rating after mitigation implementation	Low (26)	Low (13)

	Three mountaintop plateau assessment areas	Flat bottomland and transitional zone assessment areas
Identified Environmental Impact	Destruction of-/damage to Red Data Listed, nationally- or provincially protected species individuals/habitats associated with the assessment areas	
Magnitude of Negative or Positive Impact	Medium (6)	Low (4)
Duration of Negative or Positive Impact	Long term (4)	Long term (4)
Extent of Positive or Negative Impact	Local (2)	Local (2)
Irreplaceability of Natural Resources being impacted upon	Moderate (3)	Moderate (3)
Reversibility of Impact	Low (4)	Low (4)
Probability of Impact Occurrence	High (4)	High (4)
Cumulative Impact Rating prior to mitigation	Medium	Medium
Environmental Significance Score and Rating prior to mitigation	Medium-High (76)	Medium (68)

<p>Mitigation Measures to be implemented</p>	<p>A Moratorium is currently in place in the Northern Cape Province, that prohibits the destruction/removal of <i>Aloe dichotoma</i> individuals. It is therefore recommended that all of the identified eight (8) <i>Aloe dichotoma</i> individuals must be left intact. The identified individuals associated with the wind turbine laydown areas must be adequately buffered out of the proposed development footprint areas. A minimum approximately 10 m buffer distance must be implemented around each of these individuals. No current or future development is allowed to take place within such buffered zones. The proposed access/service road- and 33 kV transmission line networks as well as the access/service road associated with the proposed 132 kV transmission line, must also be adequately diverted around the identified individuals. This must be done in order to attempt to ensure their continued subsistence and longevity.</p> <p>It is recommended that the outer perimeters and cliffs of the mountaintop plateaus be adequately buffered out of the proposed development footprint areas. No current or future development is allowed to take place within such buffered zones. Based on this recommendation along with the specific presences of clusters and individuals of the provincially protected species <i>Euphorbia avasmontana</i>, <i>Cotyledon orbiculata</i>, <i>Euphorbia mauritanica</i> and <i>Ammocharis coranica</i> as well as the provincially specially protected species <i>Aloe dichotoma</i>, the positions of the following wind turbines and their laydown areas were subsequently proactively relocated by the applicant, away from any of these ecologically/conservationally significant/sensitive areas and -species individuals:</p> <ul style="list-style-type: none"> • B01, B03, B07, B09, B15 & B22 • D01 • F03
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	<p>The access/service road associated with the proposed 132 kV transmission line, must be adequately diverted around the identified <i>Euphorbia avasmontana</i> cluster, associated with the flat bottomland areas and transitional zone surrounding the mountain range. This must be done in order to attempt to ensure its continued subsistence and longevity.</p> <p>A Protected Tree License has to be obtained from the Northern Cape Department: Agriculture, Environmental Affairs, Rural Development and Land Reform, prior to the commencement of any construction activities and the subsequent potential removal/destruction of any nationally protected tree species individuals. It is however recommended that all of the identified thirty (30) <i>Boscia albitrunca</i> individuals of $\geq 2\text{m}$ in height and the identified twenty-one (20) significantly sized <i>Boscia albitrunca</i> individuals ($\geq 3\text{ m}$ in height), must be left intact. The identified individuals associated with the wind turbine laydown areas and electrical combiner footprint areas must be adequately buffered out of the proposed development footprint areas. A minimum approximately 15 m buffer distance must be implemented around each of these individuals. No current or future development is allowed to take place within such buffered zones. The proposed access/service road- and 33 kV transmission line networks as well as the main site access/service road and the access/service road associated with the proposed 132 kV transmission line, must also be adequately diverted around the identified locally significant individuals. This must be done in order to attempt to ensure their continued subsistence and longevity. Based on this recommendation, the positions of the following wind turbines and their laydown areas were subsequently proactively relocated by the applicant, away from any of these locally significant nationally protected tree individuals:</p> <ul style="list-style-type: none"> • B21, B23 • Northern electrical combiner
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It is the opinion of the specialist that a Biodiversity Offset is not necessarily required for the proposed removal/destruction of nationally protected tress species individuals.

A Provincial Flora Permit has to be obtained from the Northern Cape Department: Agriculture, Environmental Affairs, Rural Development and Land Reform, prior to the commencement of any construction activities and the subsequent potential removal/destruction of any identified provincially protected species individuals. It is however recommended that the single cluster of the identified provincially protected species *Aloe claviflora*, must be adequately relocated to another suitable and similar area as to where it was removed from. It is also recommended that representative numbers of individuals/clusters of the provincially protected species *Aloe claviflora* and *Euphorbia braunsii* as well as all ten (10) identified individuals of the provincially specially protected species *Hoodia gordonii* identified throughout the flat bottomland areas and transitional zone surrounding the mountain range, must be adequately relocated to another suitable and similar area as to where they were removed from. This relocation process must be completed prior to the commencement of any vegetation clearance- and/or construction activities. A Protected Plant Species Relocation Management Plan must be compiled by a suitably qualified and experienced ecologist.

Due to the subsequent relocation of certain wind turbines and their laydown areas as discussed earlier above, it is however not anticipated that the identified *Hoodia gordonii* individuals associated with the mountaintop plateaus, will be directly affected by the proposed development. It is therefore recommended that they must be left intact. The proposed access/service road portion towards wind turbine number D05, must also be adequately diverted around the single identified individual, which was found to be present there.

The proposed development construction footprints must be kept as small as practicably possible to reduce the surface impact on surrounding vegetation and no unnecessary/unauthorised footprint expansion into the local or broader natural landscape surrounding the assessment areas, may take place.

Vegetation clearance must be restricted to the narrow linear sections of the proposed wind turbine access/service road routes as well as the proposed 33 kV transmission line network access/service road routes, as far as practicably possible.

Vegetation clearance must be restricted to the narrow linear sections of the proposed main site access/service road route as well as the proposed 132 kV transmission line access/service road route, as far as practicably possible.

No site construction basecamps may be established within the local or broader natural landscape surrounding the assessment areas.

Adequately cordon off the proposed development construction footprint area and ensure that no construction activities, -machinery or -equipment operate or impact within the local or broader surrounding natural landscape outside the cordoned off area.

Adequate operational procedures for construction machinery and equipment must be developed in order to strictly govern and restrict movement of machinery only within the proposed development construction footprint areas and to ensure environmentally responsible construction practices and activities.

	<p>Existing roads and farm tracks in close proximity to the proposed development construction footprint areas, must be used during the construction phase. No new temporary roads or tracks may be constructed or implemented through the local or broader natural landscape surrounding the assessment areas.</p> <p>Disturbed areas within and immediately surrounding the proposed development footprint areas must be adequately rehabilitated as soon as practicably possible after construction. A Rehabilitation Management Plan must be compiled by a suitably qualified and experienced ecologist.</p> <p>It is recommended that a sufficient grazing management plan and practices must be implemented for livestock of the local farmers/land users, in order to prevent continued significant overgrazing of the landscape and to attempt to improve/restore the ecological condition, over time.</p> <p>It is also recommended that a sufficient game management plan and practices must be implemented for the proposed wildlife camp, in order to adequately manage the camp and to attempt to improve/restore the ecological condition, over time. The Game Management Plan must be compiled by a suitably qualified and experienced ecologist.</p>	
Cumulative Impact Rating after mitigation implementation	Low	Low
Environmental Significance Score and Rating after mitigation implementation	Low (48)	Low (32)

	Three mountaintop plateau assessment areas	Flat bottomland and transitional zone assessment areas
Identified Environmental Impact	Terrestrial and aquatic alien invasive species establishment	
Magnitude of Negative or Positive Impact	Low (4)	Low (4)
Duration of Negative or Positive Impact	Long term (4)	Long term (4)
Extent of Positive or Negative Impact	Local (2)	Regional (3)
Irreplaceability of Natural Resources being impacted upon	Low (2)	Moderate (3)
Reversibility of Impact	High (2)	High (2)
Probability of Impact Occurrence	Medium (3)	High (4)
Cumulative Impact Rating prior to mitigation	Low	Medium
Environmental Significance Score and Rating prior to mitigation	Low (42)	Medium (64)

Mitigation Measures to be implemented	<p>It is recommended that all individuals of the identified alien invasive species <i>Prosopis glandulosa</i>, must be actively eradicated from the identified areas, in accordance with the requirements of the National Environmental Management: Biodiversity Act (Act 10 of 2004); Alien and Invasive Species Regulations, 2014. Removed materials must also be adequately and lawfully disposed of, in order to prevent potential further spreading/dispersal.</p> <p>Implement an adequate Alien Invasive Species Management and Prevention Plan during the construction and operational phases. Such a Management Plan must be compiled by a suitably qualified and experienced ecologist.</p> <p>Disturbed areas within and immediately surrounding the proposed development footprint areas must be adequately rehabilitated as soon as practicably possible after construction. A Rehabilitation Management Plan must be compiled by a suitably qualified and experienced ecologist.</p> <p>It is recommended that a sufficient grazing management plan and practices must be implemented for livestock of the local farmers/land users, in order to prevent continued significant overgrazing of the landscape and to attempt to improve/restore the ecological condition, over time.</p> <p>It is also recommended that a sufficient game management plan and practices must be implemented for the proposed wildlife camp, in order to adequately manage the camp and to attempt to improve/restore the ecological condition, over time. The Game Management Plan must be compiled by a suitably qualified and experienced ecologist.</p>
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	<p>No transmission line pylons may be constructed inside- or within 20 m of any watercourse- or flow path/drainage line crossings. Disturbed areas within and immediately surrounding the proposed watercourse- and flow path/drainage line crossings, must be adequately rehabilitated concurrently with the construction processes. A Rehabilitation Management Plan must be compiled by a suitably qualified and experienced ecologist.</p>	
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Cumulative Impact Rating after mitigation implementation	Low	Low
Environmental Significance Score and Rating after mitigation implementation	Low (11)	Low (24)

	Three mountaintop plateau assessment areas	Flat bottomland and transitional zone assessment areas
Identified Environmental Impact	Surface material erosion	
Magnitude of Negative or Positive Impact	Low (4)	Low (4)
Duration of Negative or Positive Impact	Long term (4)	Long term (4)
Extent of Positive or Negative Impact	Local (2)	Local (2)

Irreplaceability of Natural Resources being impacted upon	Low (2)	Low (2)
Reversibility of Impact	High (2)	High (2)
Probability of Impact Occurrence	Medium (3)	High (4)
Cumulative Impact Rating prior to mitigation	Low	Low
Environmental Significance Score and Rating prior to mitigation	Low (42)	Medium (60)
Mitigation Measures to be implemented	<p>Implement an adequate Stormwater and Erosion Management Plan during the construction and operational phases of the proposed development. This must be done to sufficiently manage storm water runoff and clean/dirty water separation, in order to prevent any significant soil erosion within and around the assessment areas.</p> <p>Disturbed areas within and immediately surrounding the proposed development footprint areas must be adequately rehabilitated as soon as practicably possible after construction. A Rehabilitation Management Plan must be compiled by a suitably qualified and experienced ecologist.</p>	
Cumulative Impact Rating after mitigation implementation	Low	Low
Environmental Significance Score and Rating after mitigation implementation	Low (11)	Low (22)

	Three mountaintop plateau assessment areas	Flat bottomland and transitional zone assessment areas
Identified Environmental Impact	Dust generation and emissions	
Magnitude of Negative or Positive Impact	Low (4)	Low (4)
Duration of Negative or Positive Impact	Short term (2)	Short term (2)
Extent of Positive or Negative Impact	Local (2)	Regional (3)
Irreplaceability of Natural Resources being impacted upon	Low (2)	Moderate (3)
Reversibility of Impact	High (2)	High (2)
Probability of Impact Occurrence	Medium (3)	High (4)
Cumulative Impact Rating prior to mitigation	Low	Low
Environmental Significance Score and Rating prior to mitigation	Low (36)	Medium (56)

Mitigation Measures to be implemented	Implement suitable dust management and prevention measures during the construction phase of the proposed development.	
	Construction areas and –roads to be sufficiently wetted down during the construction phase in order to prevent significant fugitive dust emissions.	
	Adequate operational procedures for machinery and equipment must be developed to strictly govern and restrict movement of machinery, in order to avoid unnecessary fugitive dust emissions and ensure environmentally responsible construction practices and activities.	
	Disturbed areas within and immediately surrounding the proposed development footprint areas must be adequately rehabilitated as soon as practicably possible after construction. A Rehabilitation Management Plan must be compiled by a suitably qualified and experienced ecologist.	
	No transmission line pylons may be constructed inside- or within 20 m of any watercourse- or flow path/drainage line crossings. Disturbed areas within and immediately surrounding the proposed watercourse- and flow path/drainage line crossings, must be adequately rehabilitated concurrently with the construction processes. A Rehabilitation Management Plan must be compiled by a suitably qualified and experienced ecologist.	
Cumulative Impact Rating after mitigation implementation	Low	Low
Environmental Significance Score and Rating after mitigation implementation	Low (9)	Low (20)

	Three mountaintop plateau assessment areas	Flat bottomland and transitional zone assessment areas
Identified Environmental Impact	Impeding and contamination of the flow regimes of the numerous watercourses and water drainage lines/preferential flow paths, within the associated local and broader quaternary surface water catchment- and drainage area	
Magnitude of Negative or Positive Impact	Low (4)	Medium (6)
Duration of Negative or Positive Impact	Short term (2)	Short term (2)
Extent of Positive or Negative Impact	Local (2)	Regional (3)
Irreplaceability of Natural Resources being impacted upon	Low (2)	Moderate (3)
Reversibility of Impact	Moderate (3)	Low (4)
Probability of Impact Occurrence	Low (2)	High (4)
Cumulative Impact Rating prior to mitigation	Low	Medium
Environmental Significance Score and Rating prior to mitigation	Low (26)	Medium (72)

Mitigation Measures to be implemented	<p>No transmission line pylons may be constructed inside- or within 20 m of any watercourse- or flow path/drainage line crossings. The development design layouts of the proposed wind turbine access/service road network and the 33 kV transmission line network with its access/service road network, throughout the mountaintop plateaus as well as the proposed main site access/service road and the 132 kV transmission line with its access/service road throughout the flat bottomland areas and transitional zone, must allow for continued flow through the relevant watercourses and flow paths/drainage lines. This must be done in order to maintain/ensure their ecological functionality and -integrity over time. Disturbed areas within and immediately surrounding the proposed watercourse- and flow path/drainage line crossings, must be adequately rehabilitated concurrently with the construction processes. A Rehabilitation Management Plan must be compiled by a suitably qualified and experienced ecologist.</p> <p>An adequate Stormwater and Erosion Management Plan must also be implemented during the construction- and operational phases of the proposed development, in order to assist with the water channelling and allow for continued flow within the local catchment. This must be done to sufficiently manage storm water runoff and clean/dirty water separation in order to attempt to maintain/ensure the ecological functionality and - integrity of the local and broader quaternary surface water catchment- and drainage area.</p> <p>A Water Use License Application (WULA) must furthermore be submitted to the Department of Water and Sanitation (DWS), to request authorisation for the proposed development through the six (6) drainage line/flow path- and watercourse crossings, associated with the mountaintop plateaus as well as through the approximately sixty-one (61) watercourse- and drainage line/flow path crossings, associated with the flat bottomland areas and transitional zone, in accordance with the National Water Act (Act 36 of 1998).</p>
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	<p>If hydrocarbons or other chemicals are to be stored on site during the construction phase, the storage areas must be situated as far away as practicably/feasibly possible from the watercourses and water drainage lines/preferential flow paths.</p> <p>Hydrocarbon and other chemical storage areas must be adequately bunded in order to be able to contain a minimum of 150 % of the capacity of storage tanks/units.</p> <p>Adequate hydrocarbon and other chemical storage, handling, usage and spillage clean-up procedures must be developed and all relevant construction personnel must be sufficiently trained on- and apply these procedures during the entire construction phase.</p> <p>Spill kits must be readily available on the construction site. All employees must be adequately trained on the correct procedure and use of the spill kits.</p>	
Cumulative Impact Rating after mitigation implementation	Low	Low
Environmental Significance Score and Rating after mitigation implementation	Low (10)	Low (28)

Operational Phase Impacts Significance:

	Three mountaintop plateau assessment areas	Flat bottomland and transitional zone assessment areas
Identified Environmental Impact	Continued dust generation and emissions	
Magnitude of Negative or Positive Impact	Low (4)	Low (4)
Duration of Negative or Positive Impact	Medium term (3)	Medium term (3)
Extent of Positive or Negative Impact	Local (2)	Regional (3)
Irreplaceability of Natural Resources being impacted upon	Low (2)	Moderate (3)
Reversibility of Impact	High (2)	High (2)
Probability of Impact Occurrence	Medium (3)	High (4)
Cumulative Impact Rating prior to mitigation	Low	Low
Environmental Significance Score and Rating prior to mitigation	Low (39)	Medium (60)

Mitigation Measures to be implemented	<p>All the recommended mitigation measures for the construction phase must be adequately implemented and managed.</p> <p>Implement suitable dust management and prevention measures during the operational phase of the proposed development.</p> <p>Adequate operational procedures for machinery and equipment must be developed to strictly govern and restrict movement of machinery, in order to avoid unnecessary fugitive dust emissions and ensure environmentally responsible construction practices and activities.</p>	
Cumulative Impact Rating after mitigation implementation	Low	Low
Environmental Significance Score and Rating after mitigation implementation	Low (10)	Low (22)

	Three mountaintop plateau assessment areas	Flat bottomland and transitional zone assessment areas
Identified Environmental Impact	Continued impeding and contamination of the flow regimes of the numerous watercourses and water drainage lines/preferential flow paths, within the associated local and broader quaternary surface water catchment- and drainage area	
Magnitude of Negative or Positive Impact	Low (4)	Medium (6)
Duration of Negative or Positive Impact	Medium term (3)	Medium term (3)
Extent of Positive or Negative Impact	Local (2)	Regional (3)
Irreplaceability of Natural Resources being impacted upon	Low (2)	Moderate (3)
Reversibility of Impact	Moderate (3)	Low (4)
Probability of Impact Occurrence	Low (2)	High (4)
Cumulative Impact Rating prior to mitigation	Low	Medium
Environmental Significance Score and Rating prior to mitigation	Low (28)	Medium-High (76)

Mitigation Measures to be implemented	<p>If all the recommended mitigation measures for the construction phase are adequately implemented and managed, it should prove sufficient in preventing any continued impeding-, contamination of- or significant impact on the numerous watercourses and water drainage lines/preferential flow paths, within the associated local and broader quaternary surface water catchment- and drainage area.</p> <p>An adequate Stormwater and Erosion Management Plan must also be implemented during the construction- and operational phases of the proposed development, in order to assist with the water channelling and allow for continued flow within the local catchment. This must be done to sufficiently manage storm water runoff and clean/dirty water separation in order to attempt to maintain/ensure the ecological functionality and - integrity of the local and broader quaternary surface water catchment- and drainage area.</p>	
Cumulative Impact Rating after mitigation implementation	Low	Low
Environmental Significance Score and Rating after mitigation implementation	Low (11)	Low (30)

Avifauna Impact Assessment:

The proposed Prieska Power Reserve WEF will have several potential impacts on priority avifauna. The impacts are the following:

- Displacement of priority species due to disturbance associated with construction of the WEF and associated infrastructure.
- Displacement of priority species due to habitat transformation associated with construction of the WEF and associated infrastructure.
- Displacement of priority species due to disturbance associated with construction of the overhead power lines.
- Mortality of priority species due to collisions with the turbines in the operation phase.
- Mortality of priority species due to collisions with the overhead lines

- Mortality of priority species due to electrocution on the overhead lines, collector substations and on-site substations
- Displacement of priority species due to disturbance associated with decommissioning of the WEF and associated infrastructure.
- Displacement of priority species due to disturbance associated with decommissioning of the overhead lines, collector substations and on-site substations.

Displacement of priority species due to disturbance associated with construction of the WEF and associated infrastructure.

It is inevitable that a measure of displacement will take place for all priority species during the construction phase of the WEF, due to the disturbance factor associated with the construction activities. This is likely to affect ground nesting species severely, as this could temporarily disrupt their reproductive cycle. Species which fall in this category are Ludwig's Bustard, Karoo Korhaan, Kori Bustard, Double-banded Courser, African Rock Pipit, Grey-winged Francolin, Northern Black Korhaan and Spotted Eagle-Owl. Some raptors might also be affected, e.g., Pale Chanting Goshawk which could potentially breed in the small *Senegalia mellifera* trees in the drainage lines.

Another major potential concern is the potential displacement of the estimated five (5) pairs of Verreaux's Eagles that breed within the PAOI, due to disturbance. The VE guidelines recommend a minimum no-disturbance buffer of 1km around Verreaux's Eagle nests (Ralston-Patton 2021) where no construction activities should take place.

Some species might be able to recolonise the area after the completion of the construction phase, but for some species this might only be partially the case, resulting in lower densities than before once the WEFs are operational, due to the disturbance factor of the operational turbines.

The impact is rated as Medium before and after mitigation.

The following mitigation measures are proposed:

- Construction activity should be restricted to the immediate footprint of the infrastructure as far as possible, and in particular to the proposed road network. Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species.
- Construction of new roads should only be considered if existing roads cannot be upgraded.
- Vehicle and pedestrian access to the site should be controlled and restricted as much as possible to prevent unnecessary disturbance of priority species.
- No construction activity should take place within 1km of any Verreaux's Eagle nests, except if there is already an existing road, and avoiding the 1km buffer (see figure 23, Turbine B19 and Combiner Station 02 replaced to be outside the 1km buffer zone) would result in the construction of a new road. In the latter instance, construction activities should take place outside the breeding season i.e. from November to March, if possible.

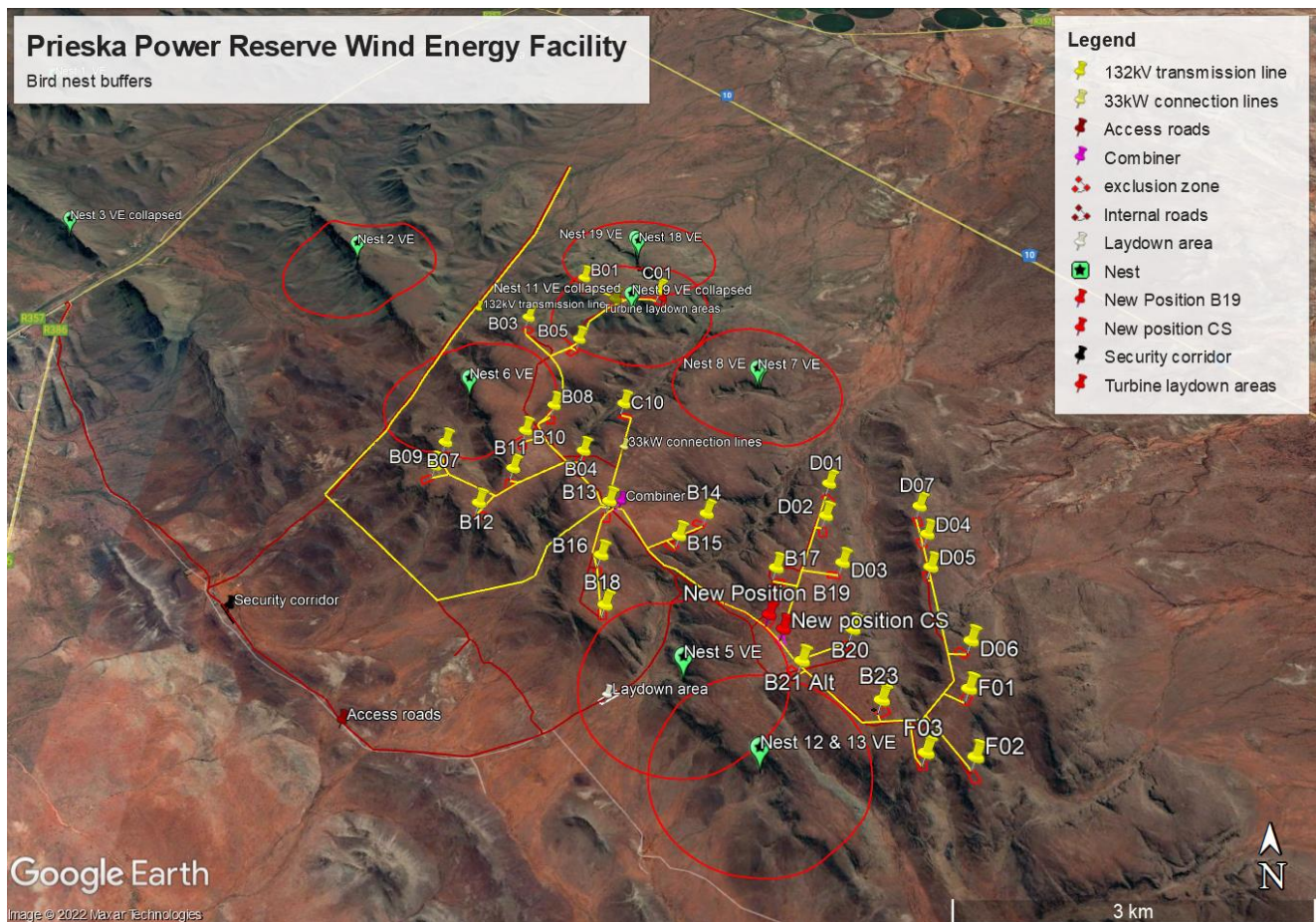


Figure 23: Mitigating turbine position B19 and Combiner Station 02 to be outside the 1km nest buffer zone

Displacement of priority species due to habitat transformation associated with construction of the WEF and associated infrastructure.

The network of roads is likely to result in significant habitat fragmentation, and it could influence the density of several species, particularly terrestrial species such as Ludwig’s Bustard, Kori Bustard, Karoo Korhaan, Northern Black Korhaan, Double-banded Courser, Grey-winged Francolin and Africa Rock Pipit. Various species of raptors that could also be affected. Given the current density of the proposed turbine layout and associated road infrastructure for the WEF development, it is not expected that any priority species will be permanently displaced from the development sites.

The impact is rated as Medium before and Low after mitigation.

The following mitigation measures are proposed:

- Vegetation must be rehabilitated to its former state where possible after construction.
- The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint is concerned.
- Formal live-bird monitoring should be resumed once the turbines have been constructed, as per the most recent edition of the Best Practice Guidelines (Jenkins et al. 2015). The purpose of this would be to establish if displacement of priority species has occurred and to what extent. The exact time when operational monitoring should commence, will depend on the construction schedule, and should commence when the first turbines start operating. The Best Practice Guidelines require that, as an absolute minimum, operational

monitoring should be undertaken for the first two (preferably three) years of operation, and then repeated again in year 5, and again every five years thereafter for the operational lifetime of the facility.

Displacement of priority species due to disturbance associated with construction of the overhead power lines.

It is inevitable that a measure of displacement will take place for all priority species during the construction phase of the WEF, including the associated electricity infrastructure, due to the disturbance factor associated with the construction activities. This is likely to affect ground nesting species severely, as this could temporarily disrupt their reproductive cycle. Species which fall in this category are Ludwig's Bustard, Karoo Korhaan, Kori Bustard, Double-banded Courser, African Rock Pipit, Grey-winged Francolin, Northern Black Korhaan and Spotted Eagle-Owl. Some raptors might also be affected, e.g., Pale Chanting Goshawk which could potentially breed in the small *Senegalia mellifera* trees in the drainage lines.

Another major potential concern is the potential displacement of the estimated five (5) pairs of Verreaux's Eagles that breed within the PAOI, due to disturbance. The VE guidelines recommend a minimum no-disturbance buffer of 1km around Verreaux's Eagle nests (Ralston-Patton 2021) where no construction activities should take place. The exception to this would be in certain circumstances where a nest is located on or within 1km of an existing transmission line. In such an event, it is preferable to place any new powerlines next to the existing powerline, even if this means temporary disturbance of a pair of breeding eagles. By placing the new line next to an existing line, the creation of a new collision risk in a pristine area is avoided, and the collision risk that the new line poses is also mitigated to some extent through making both the lines more visible. The temporary, short-term disturbance of the eagles is less detrimental compared to the long-term collision risk that the new powerline will pose in a pristine area and the additional habitat fragmentation which it will cause. This particularly relevant for the construction of the proposed 132kV OHL and associated road, which may cause the temporary displacement of priority species using the existing Burchell - Cuprum 132kV line for roosting and nesting purposes, due to disturbance associated with the construction activities. The proposed 132kV OHL will run for a considerable distance next to the existing 132kV OHL and comes to within 700m of an existing Verreaux's Eagle nest. In the latter instance, construction activities should take place outside the breeding season i.e. from November to March, if possible.

The impact is rated as Medium before and after mitigation.

The following mitigation measures are proposed:

- Conduct a pre-construction inspection (avifaunal walk-through) to record the status of the priority species nests on the existing Burchell – Cuprum 132kV high voltage line. If a nest of a SCC is found to be occupied, the avifaunal specialist must consult with the contractor to find ways of minimising the potential disturbance to the breeding pair of birds during the construction period. This could include measures such as delaying some of the activities until after the breeding season.
- Construction activity should be restricted to the immediate footprint of the infrastructure as far as practically possible.
- Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species.
- Measures to control noise and dust should be applied according to current best practice in the industry.
- Maximum used should be made of existing access roads and the construction of new roads should be kept to a minimum.

- No construction activity should take place within 1km of any Verreaux's Eagle nests, except if there is already an existing OHL, and the new OHL is routed directly next to the existing OHL. In the latter instance, construction activities should take place outside the breeding season i.e. from November to March, if possible.

Mortality of priority species due to collisions with the turbines in the operation phase.

The proposed WEF will pose a potential collision risk to several priority species which could occur regularly in the PAOI. Species exposed to this risk are large terrestrial species i.e., mostly bustards, korhaans, francolins and coursers, although bustards generally seem to be not as vulnerable to turbine collisions as was originally anticipated (Ralston-Paton & Camagu, 2019). Soaring priority species, i.e., raptors such as Pale Chanting Goshawk, Lanner Falcon, Booted Eagle, Greater Kestrel, White-backed Vulture, Lappet-faced Vulture and in particular, Verreaux's Eagle, are most at risk of collision mortality of all the priority species likely to occur regularly in the PAOI.

The impact is rated as High before and Low after mitigation.

The following mitigation measures are proposed:

- No turbines (including their rotor swept area) should be constructed within 200m around water points and 150m from the centre line of drainage lines to limit potential collision risk to nocturnal priority species, e.g. Spotted Eagle-Owl, which are attracted to the surface water.
- All turbines must be curtailed from an hour before sunrise to an hour after sunset every day for the operational lifetime of the WEF, to eliminate the risk of priority species collisions, particularly to Verreaux's Eagle. This is a novel mitigation measure and has been agreed to by the proponent. See Appendix 4 for a detailed explanation of this proposed mitigation measure, including a monthly sunrise and sunset chart for Prieska, and the advantages over traditional anti-collision buffer zones.
- Carcass searches must be implemented to establish mortality rates, as per the most recent edition of the Best Practice Guidelines (Jenkins et al. 2015). The exact time when operational monitoring should commence, will depend on the construction schedule, and should commence when the first turbines starts operating. The Best Practice Guidelines require that, as an absolute minimum, operational monitoring should be undertaken for the first two (preferably three) years of operation, and then repeated again in year 5, and again every five years thereafter for the operational lifetime of the facility. If annual estimated collision rates indicate unsustainable mortality levels of priority species, i.e. if natural background mortality together with the estimated mortality caused by turbine collisions exceeds a critical mortality threshold as determined by the avifaunal specialist in consultation with other experts e.g. BLSA, additional measures will have to be implemented. This must be undertaken in consultation with a qualified avifauna specialist.

Mortality of priority species due to collisions with the overhead lines

Collisions are arguably the biggest threat posed by overhead lines to birds in southern Africa (Van Rooyen, 2004). Most heavily impacted upon are bustards, storks, cranes and various species of waterbirds, and to a lesser extent, vultures. These species are mostly heavy-bodied birds with limited manoeuvrability, which makes it difficult for them to take the necessary evasive action to avoid colliding with transmission lines (Van Rooyen, 2004; Anderson, 2001).

Using a controlled experiment spanning a period of nearly eight years (2008 to 2016), the EWT and Eskom tested the effectiveness of two types of line markers in reducing powerline collision mortalities of large birds on three 400kV transmission lines near Hydra substation in the Karoo. Marking was highly effective for Blue Cranes, with a 92% reduction in mortality, and large birds in general with a 56% reduction in mortality, but not for bustards, including the endangered Ludwig's Bustard. The two different marking devices were approximately equally effective, namely spirals and bird flappers, they found no evidence supporting the preferential use of one type of marker over the other (Shaw et al., 2017).

The impact is rated as Medium before and after mitigation.

The following mitigation measures are proposed:

- Use underground cables as much as possible for the medium voltage connections.
- All overhead lines must be marked with Eskom approved Bird Flight Diverters according to the latest official Eskom Engineering Instruction.

Mortality of priority species due to electrocution on the overhead lines, collector substations and on-site substations

Electrocution refers to the scenario where a bird is perched or attempts to perch on the electrical structure and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components (van Rooyen, 2000). The electrocution risk is largely determined by the design of the electrical hardware and the size of the bird.

Ideally the 33kV reticulation network should be placed underground where possible. If the lines must run above ground, for technical reasons, the poles could potentially pose a serious electrocution risk to raptors, which could result in mortalities even more severe than turbine collisions, unless a bird-friendly design is used. Raptors and vultures are particularly at risk. Electrocutions within the proposed substations are possible, however the likelihood of this impact on the more sensitive Red List priority species is remote, as these species are unlikely to regularly utilise the infrastructure within the substation yard for perching or roosting.

The only priority species capable of bridging the clearance distances of the proposed 132kV power line infrastructure are White-backed Vultures and Lappet-faced Vultures, due to their size and gregarious nature. There is an established White-backed Vulture and Lappet-faced Vulture roost on this line ~25 km south-west of the PAOI (>100 birds). Based on interviews with landowners and personal observations, it seems that the numbers of White-backed Vultures and Lappet-faced Vultures are on the increase south of the Orange River in the Northern Cape during the non-breeding season (December to May). These birds establish temporary roosts on power lines, and it is entirely possible that the birds could on occasion roost on the proposed 33kV and 132kV powerlines. Depending on the proposed pole design, this could place them at risk of electrocution.

The impact is rated as High before and Low after mitigation.

The following mitigation measures are proposed:

- Construction of the power line using an approved bird friendly pole/tower design in accordance with the Eskom Distribution Technical Bulletin relating to bird friendly structures. The avifaunal specialist must sign off on the final design.

- The hardware within the proposed central collector substation yard is too complex to warrant any mitigation for electrocution at this stage. It is recommended that if on-going impacts are recorded once operational, site-specific mitigation (insulation) be applied reactively. This is an acceptable approach because Red List priority species are unlikely to frequent the switching station and substation and be electrocuted.

Displacement of priority species due to disturbance associated with decommissioning of the WEF and associated infrastructure.

The impact of displacement due to disturbance during this phase will be similar in nature and intensity as during the construction phase.

The impact is rated as Medium before and after mitigation.

The following mitigation measures are proposed:

- Activity should as far as possible be restricted to the footprint of the infrastructure.
- Measures to control noise and dust should be applied according to current best practice in the industry.
- Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical.
- Access to the rest of the property must be restricted.
- The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the footprint is concerned.
- Measures to control noise and dust should be applied according to current best practice in the industry

Displacement of priority species due to disturbance associated with decommissioning of the overhead lines, collector substations and on-site substations.

The impact of displacement due to disturbance during this phase will be similar in nature and intensity as during the construction phase.

The impact is rated as Medium before and after mitigation.

The following mitigation measures are proposed:

- Activity should as far as possible be restricted to the footprint of the infrastructure.
- Measures to control noise and dust should be applied according to current best practice in the industry.
- Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical.
- Access to the rest of the property must be restricted.
- The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the footprint is concerned.
- Measures to control noise and dust should be applied according to current best practice in the industry

Cumulative impacts

The total affected land parcel area taken up by authorised renewable energy projects within the 30km radius (all solar PV) is approximately 260km², although the actual area affected by the solar facilities is likely to be 20%

or less of the land parcel area, i.e. ~52 km². The total area affected by the proposed Prieska Power Reserve WEF project equates to ~10 km². The combined area affected by authorised renewable energy developments within the 30 km radius around the proposed WEF, including the proposed WEF, thus equals ~62 km². Of this, the proposed WEF project constitutes ~16%. The contribution of the proposed WEF to the cumulative impact of the renewable energy projects is thus anticipated to be medium after mitigation.

The total area of natural habitat within the 30km radius around the proposed projects equates to about 2 691km² (excluding urban areas and irrigated agriculture). The total combined size of the area potentially affected by renewable energy projects will thus equate to ~2.3% of the available untransformed habitat in the 30km radius, should all the projects be constructed. However, each of these projects must still be subject to a competitive bidding process where only the most competitive projects will win a power purchase agreement required for the project to proceed to construction. The cumulative impact of all the proposed renewable energy projects is thus estimated to affect a maximum of ~2.3% or less of the available untransformed habitat, resulting in a low impact.

POST CONSTRUCTION PROGRAMME

The new procedures and minimum criteria for reporting on identified environmental themes in terms of Sections 24(5)(a) and (h) and 44 of NEMA came into force in March 2020. According to these regulations, a detailed post-construction monitoring programme must be included as part of the bird specialist study.

The proposed Prieska Power Reserve WEF could have a range of potential pre-mitigation impacts on priority avifauna ranging from medium to high, which is expected to be reduced to medium and low with appropriate mitigation. No fatal flaws were discovered during the investigations. The development is therefore supported, provided the mitigation measures listed in this report are strictly applied.

Construction Phase Impact Significance

Nature: Displacement of priority species due to disturbance during construction phase associated with the construction of the WEF		
	Without mitigation	With mitigation
Extent	Site (1)	Site (1)
Duration	Very short (1)	Very short (1)
Magnitude	High (8)	Moderate (6)
Probability	Definite (5)	Definite (5)
Significance	MEDIUM (50)	MEDIUM (40)
Status (positive or negative)	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	To some extent	
Mitigation:		
<ul style="list-style-type: none"> • Construction activity should be restricted to the immediate footprint of the infrastructure as far as possible, and in particular to the proposed road network. Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. • Construction of new roads should only be considered if existing roads cannot be upgraded. • Vehicle and pedestrian access to the site should be controlled and restricted as much as possible to prevent unnecessary disturbance of priority species. 		

- No construction activity should take place within 1km of any Verreaux's Eagle nests, except if there is already an existing road, and avoiding the 1km buffer would result in the construction of a new road. In the latter instance, construction activities should ideally take place outside the breeding season i.e. from November to March.

Residual Risks:

Due to the nature of the construction activities, it is inevitable that temporary displacement of priority species will happen as a result. While this can be mitigated to some extent, the significance of the residual impacts will remain at a medium level.

Nature: Displacement of priority species linked to habitat loss in the construction phase due to the construction of the WEF

	Without mitigation	With mitigation
Extent	Site (1)	Site (1)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	MEDIUM (33)	LOW (27)
Status (positive or negative)	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	To some extent	

Mitigation:

- Vegetation must be rehabilitated to its former state where possible after construction.
- The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint is concerned.
- Formal live-bird monitoring should be resumed once the turbines have been constructed, as per the most recent edition of the Best Practice Guidelines (Jenkins *et al.* 2015). The purpose of this would be to establish if displacement of priority species has occurred and to what extent. The exact time when operational monitoring should commence, will depend on the construction schedule, and should commence when the first turbines start operating. The Best Practice Guidelines require that, as an absolute minimum, operational monitoring should be undertaken for the first two (preferably three) years of operation, and then repeated again in year 5, and again every five years thereafter for the operational lifetime of the facility.

Residual Risks:

Due to the nature of the infrastructure, it is highly likely that long term partial displacement of priority species will happen, particularly as a result of the habitat fragmentation caused by the associated road network. The habitat transformation can be limited to some extent through mitigation measures, to keep the significance of the residual impacts at a low level.

Nature: Displacement of priority species due to disturbance associated with construction of the overhead power lines.

	Without mitigation	With mitigation
Extent	Site (1)	Site (1)
Duration	Very short (1)	Very short (1)
Magnitude	High (8)	Moderate (6)
Probability	Definite (5)	Definite (5)
Significance	MEDIUM (50)	MEDIUM (40)
Status (positive or negative)	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	To some extent	

Mitigation:

- Conduct a pre-construction inspection (avifaunal walk-through) to record the status of the priority species nests on the existing Burchell – Cuprum 132kV high voltage line. If a nest of a SCC is found to be occupied, the avifaunal specialist must consult with the contractor to find ways of minimising the potential disturbance to the breeding pair of birds during the construction period. This could include measures such as delaying some of the activities until after the breeding season.
- Construction activity should be restricted to the immediate footprint of the infrastructure as far as practically possible.
- Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species.
- Measures to control noise and dust should be applied according to current best practice in the industry.
- Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum.
- No construction activity should take place within 1km of any Verreaux’s Eagle nests, except if there is already an existing OHL, and the new OHL is routed directly next to the existing OHL. In the latter instance, construction activities should ideally take place outside the breeding season i.e. from November to March.

Residual Risks:

Due to the nature of the construction activities, it is inevitable that temporary displacement of priority species will happen as a result. While this can be mitigated to some extent, the significance of the residual impacts will remain at a medium level.

Operational Phase Impact Significance

Nature: Mortality of priority species due to collisions with the turbines in the operation phase.

	Without mitigation	With mitigation
Extent	Regional (3)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	High (8)	Low (4)
Probability	Highly probable (4)	Probable (2)
Significance	HIGH (60)	LOW (22)
Status (positive or negative)	Negative	Negative
Reversibility	Low	High
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	

Mitigation:

- No turbines (including their rotor swept areas) should be constructed within 200m around water points and 150m from the centre line of drainage lines to limit potential collision risk to nocturnal priority species (e.g., Spotted Eagle Owl) which are attracted to the surface water.
- All turbines must be curtailed from an hour before sunrise to an hour after sunset every day for the operational lifetime of the WEF, to eliminate the risk of priority species collisions, particularly to Verreaux's Eagle. This is a novel mitigation measure and has been agreed to by the proponent. See Appendix 4 for a detailed explanation of this proposed mitigation measure, including a monthly sunrise and sunset chart for Prieska, and the advantages over traditional anti-collision buffer zones.
- Carcass searches must commence to establish mortality rates, as per the most recent edition of the Best Practice Guidelines (Jenkins *et al.* 2015). The exact time when operational monitoring should commence, will depend on the construction schedule, and should commence when the first turbines starts operating. The Best Practice Guidelines require that, as an absolute minimum, operational monitoring should be undertaken for the first two (preferably three) years of operation, and then repeated again in year 5, and again every five years thereafter for the operational lifetime of the facility. If annual estimated collision rates indicate unsustainable mortality levels of priority species, i.e. if natural background mortality together with the estimated mortality caused by turbine collisions exceeds a critical mortality threshold as determined by the avifaunal specialist in consultation with other experts e.g. BLSA, additional measures will have to be implemented. This must be undertaken in consultation with a qualified avifauna specialist.

Residual Impacts:

It is not possible to completely eliminate the risk of turbine collisions, but through mitigation measures, particularly blanket daylight curtailment, it could be reduced to a low level.

Nature: Mortality of priority species due to collisions with the overhead lines

	Without mitigation	With mitigation
Extent	Local (2)	Local (2)
Duration	Long term (4)	Long term (4)
Magnitude	Medium (6)	Low (4)
Probability	Highly Probable (4)	Probable (3)
Significance	48 MEDIUM	30 MEDIUM
Status (positive or negative)	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	

Mitigation:

- Use underground cables as much as possible for the medium voltage connections.
- All overhead lines must be marked with Eskom approved Bird Flight Diversers according to the latest official Eskom Engineering Instruction.

Residual Risks:

The residual risk of collision will still be present for Ludwig's Bustard, but significantly reduced for other species.

Nature: Mortality of priority species due to electrocution on the overhead lines, collector substations and on-site substations		
	Without mitigation	With mitigation
Extent	Regional (3)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	High (8)	Low (4)
Probability	Highly probable (4)	Very improbable (1)
Significance	60 HIGH	11 LOW
Status (positive or negative)	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> Construction of the power line using an approved bird friendly pole/tower design in accordance with the Distribution Technical Bulletin relating to bird friendly structures. The avifaunal specialist must sign off on the final design. The hardware within the proposed central collector substation yard is too complex to warrant any mitigation for electrocution at this stage. It is recommended that if on-going impacts are recorded once operational, site-specific mitigation (insulation) be applied reactively. This is an acceptable approach because Red List priority species are unlikely to frequent the switching station and substation and be electrocuted. 		
Residual Risks:		
The residual risk of electrocution will be low once mitigation is implemented.		

Decommissioning Phase Impact Significance

Nature: Displacement of priority species due to disturbance associated with decommissioning of the WEF and associated infrastructure.		
	Without mitigation	With mitigation
Extent	Site (1)	Site (1)
Duration	Very short (1)	Very short (1)
Magnitude	High (8)	Moderate (6)
Probability	Definite (5)	Definite (5)
Significance	50 MEDIUM	40 MEDIUM
Status (positive or negative)	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes, but to a limited extent	
Mitigation:		
<ul style="list-style-type: none"> Activity should as far as possible be restricted to the footprint of the infrastructure. Measures to control noise and dust should be applied according to current best practice in the industry. Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. Access to the rest of the property must be restricted. The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the footprint is concerned. Measures to control noise and dust should be applied according to current best practice in the industry 		

Residual Risks:

The residual risk of displacement will be reduced but remain at a medium level after mitigation, if the proposed mitigation is implemented.

Nature: Displacement of priority species due to disturbance associated with decommissioning of the overhead lines, collector substations and on-site substations

	Without mitigation	With mitigation
Extent	Site (1)	Site (1)
Duration	Very short (1)	Very short (1)
Magnitude	High (8)	Moderate (6)
Probability	Definite (5)	Definite (5)
Significance	50 MEDIUM	40 MEDIUM
Status (positive or negative)	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes, but to a limited extent	

Mitigation:

- Activity should as far as possible be restricted to the footprint of the infrastructure.
- Measures to control noise and dust should be applied according to current best practice in the industry.
- Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical.
- Access to the rest of the property must be restricted.
- The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the footprint is concerned.
- Measures to control noise and dust should be applied according to current best practice in the industry

Residual Risks:

The residual risk of displacement will be reduced but remain at a medium level after mitigation, if the proposed mitigation is implemented.

The impacts are summarized, and a comparison made between pre-and post-mitigation phases as shown in below. The rating of environmental issues associated with different parameters prior to, and post mitigation of a proposed activity was averaged.

Comparison of summarised impacts on environmental parameters

Nature of the Impact	Rating prior to mitigation	Rating post mitigation
Displacement of priority species due to disturbance associated with construction of the WEF and associated infrastructure.	50 MEDIUM	40 MEDIUM
Displacement of priority species due to habitat transformation associated with construction of the WEF and associated infrastructure.	33 MEDIUM	27 LOW
Displacement of priority species due to disturbance associated with construction of the overhead power lines.	50 MEDIUM	40 MEDIUM

Mortality of priority species due to collisions with the turbines in the operation phase.	60 HIGH	22 LOW
Mortality of priority species due to collisions with the overhead lines	48 MEDIUM	30 MEDIUM
Mortality of priority species due to electrocution on the overhead lines, collector substations and on-site substations	60 HIGH	11 LOW
Displacement of priority species due to disturbance associated with decommissioning of the WEF and associated infrastructure.	50 MEDIUM	40 MEDIUM
Displacement of priority species due to disturbance associated with decommissioning of the overhead lines, collector substations and on-site substations	50 MEDIUM	40 MEDIUM
AVERAGE SIGNIFICANCE RATING	50 MEDIUM	31 MEDIUM

Bats Impact Assessment

The assessment area in the Northern Cape consists entirely of Nama Karoo Ecoregion. From bat activity data collected by IWS over six years, the Nama Karoo Ecoregion has low to moderate bat activity levels compared with other ecoregions. The most significant bat important features of this FA are the cave-forming Dolomite geology in the eastern parts, the sedimentary rock, the river and the scattered wetlands. Roosting potential exists in possible caves, rock outcrops, trees and buildings and foraging potential over the river courses and wetlands/seasonal pans. Zinc mining surrounds the town of Copperton. Defunct underground mines can harbour large colonies of bats. The species of conservation importance, according to Child et al. (2016), to look out for in more detailed EIAs is *Rhinolophus denti* (NT (Schoeman et al. (2016a))). Least concern species at the highest risk of wind turbine fatality (according to Sowler et al., (2017) and Perold and MacEwan (2017)) are Natal Long-fingered Bat *Miniopterus natalensis*, Cape Serotine Bat *Neoromicia capensis* and Egyptian Free-tailed Bat *Tadarida aegyptiaca*.

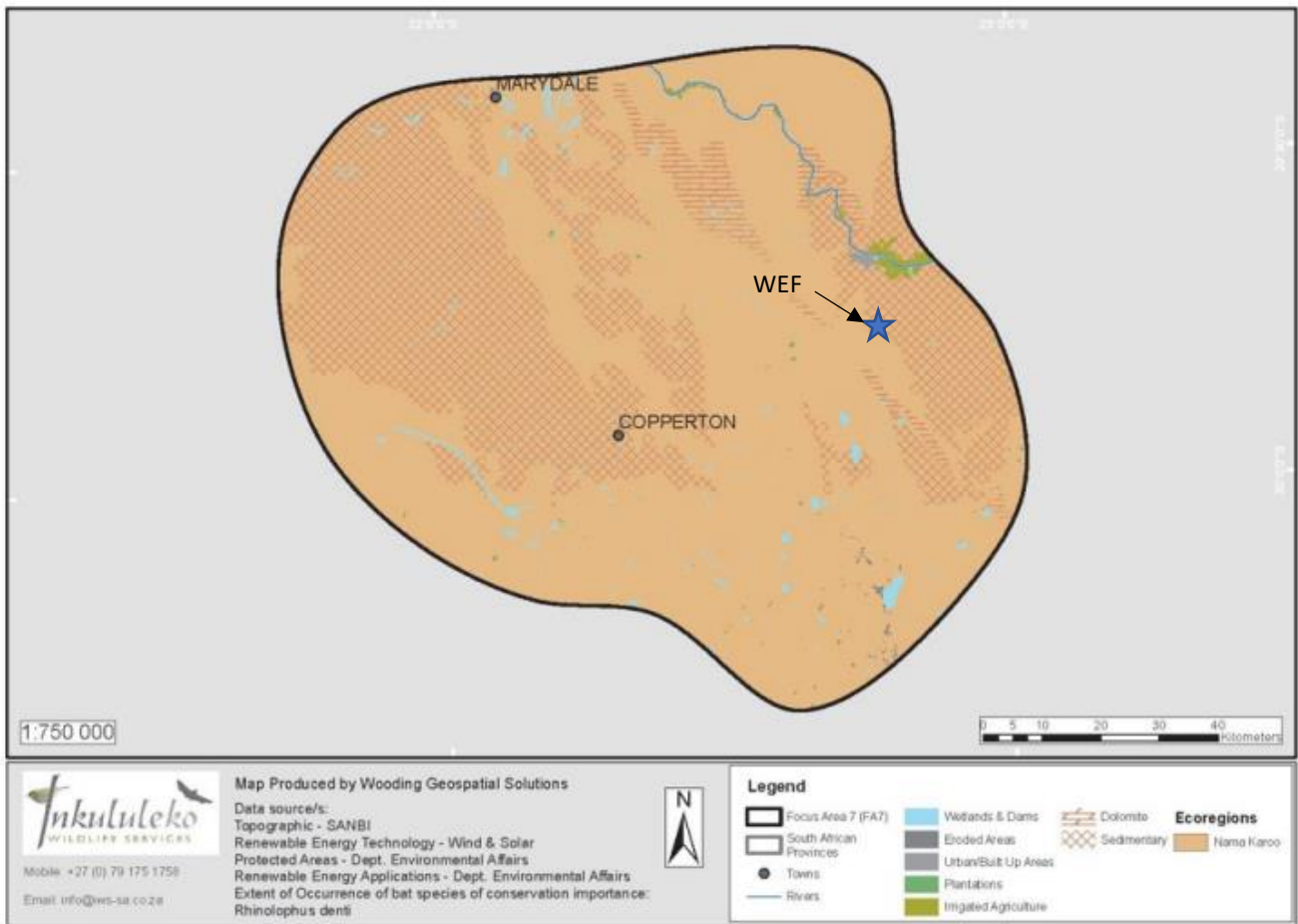


Figure 24: Nama Karoo Eco Region Map (CSIR, 2020)

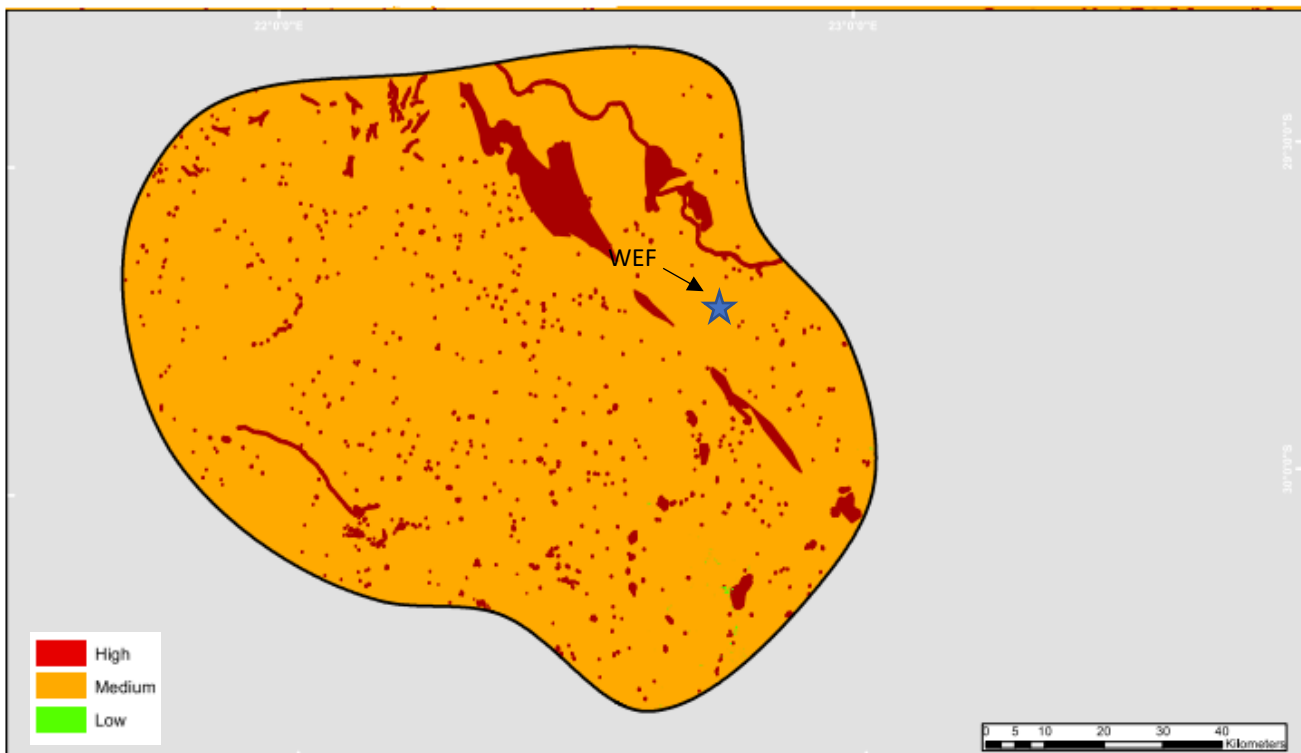


Figure 25: Wind Development Sensitivity (CSIR, 2020)

Impact 1: Construction of wind turbines, roads, power lines, and other infrastructure for proposed WEFs can destroy or cause disturbance to bat roosts if construction activities are close to roosts. The potential impacts could have low to high negative significance depending on the size and sensitivity of the roost and the vicinity of the development to the roost.

Mitigation of Impact 1: • Pre-construction surveys or monitoring should attempt to identify all roosts and potential roosts on and around the site of development. • Minimise the construction footprint, for example, by minimising clearing of natural vegetation and agricultural areas. • It is recommended that areas of Low bat sensitivity are the first-choice selection for all turbine development (including the full rotor swept zone of wind turbines). Operational mitigation measures should also be recommended for wind turbines placed in Medium bat sensitive areas.

Impact 2: Bat fatalities due to collision with or barotrauma caused by wind turbines while foraging or migrating

Mitigation of Impact 2: • Constructing a facility with the least rotor swept area is preferable. • It is recommended that there should be at least a 500 m no turbine development zone around any existing or newly built or to be constructed / operations and maintenance buildings due to the attraction of bats to nocturnal lighting around buildings and the potential to find roosting space in walls and roofs. Should all of the below additional measures be implemented, the no turbine development buffer around buildings can be reduced to 200 m: o With the exception of compulsory civil aviation lighting, minimise artificial lighting at night, especially high-intensity lighting, steady-burning, or bright lights such as sodium vapour, quartz, halogen, or other bright spotlights at sub-station, offices and turbines. All non-aviation lights should be hooded downward and directed to minimise horizontal and skyward illumination. o All non-aviation internal turbine nacelle and tower lighting should be extinguished when unoccupied. o Bat-proof constructions for all new buildings. • Bat fatality minimization measures such as curtailment (increasing the turbine rotation cut-in speed or stopping turbine movement) or ultrasonic deterrents should be recommended where appropriate, based on site specific preconstruction monitoring conducted according to Sowler et al. (2017) or subsequent versions and knowledge from already operational facilities. • Operational monitoring according to Aronson et al. (2014) or subsequent versions to be conducted from the commencement of turbines spinning.

Sensitivity Feature Class	Data Source and Date of Publications	Sensitivity Explanation	Feature Subclass	Feature Sub-class Sensitivity	Buffer Distance
Ecoregions	Terrestrial Ecoregions (Olson et al., 2001). The Nature Conservancy, Arlington, VA. Available at http://maps.tnc.org/files/shp/terr-ecoregionsTNC.zip	Terrestrial Ecoregions are large units of land containing a geographically distinct assemblage of species, natural communities, and environmental conditions (WWF, 2014). The Ecoregion concept is similar to the Biome concept, incorporating both vegetation communities and climate. There is evidence to suggest that bats might adapt to local environmental conditions at a Biome level (MillerButterworth et al., 2003). From numerous monitoring assessments (MacEwan et al. 2016), the average bat passes per hour was calculated for eight of the 17 ecoregions to gain an understanding of the bat activity levels in each and in the case of wind energy, the potential turbine fatality risk in each (Sowler et al. 2017). For the KwaZuluCape Coastal Forest Mosaic, activity levels were verified with Taylor et al. (2007).	Nama Karoo	Medium	None

Source: Phase 2 strategic environmental assessment for wind and solar photovoltaic energy in South Africa (CSIR, 2020)

It is concluded for the proposed wind energy facility location

Heritage, Archaeology and Palaeontology Impact Assessment:

A phase 1 Heritage Impact Assessment was carried out for a proposed new Wind Energy Facility (WEF) to be established outside Prieska in the NC Province. The proposed development footprint is primarily located on mountainous parts of properties Prieska A/A, Karabee 50, Prieskas Poort 51 and Keikams Poort 71, with its central point situated approximately 14 km due south of the Prieska CBD. Proposed development will primarily affect geologically recent sandy gravels, alluvium and localized surface calcretes covering Precambrian rocks of the Asbestos Hills Subgroup iron formation. The sediments are not considered to be palaeontologically sensitive. Although the SAHRIS palaeosensitivity map shows all of the Ghaap Group as potentially fossiliferous, the Asbestos Hills Subgroup iron formation does not preserve trace fossils and is too old to contain vertebrate or plant fossils. The geologically recent sedimentary overburden within the study area is not considered to be conducive for the preservation of Quaternary fossils. Recorded heritage finds represent Stone Age – related artefacts and historical structures confined to low-lying areas. The Stone Age archaeological footprint is primarily represented by single, isolated finds considered geographically in place, but contextually derived. The valley landscape shows an ephemeral prehistoric human presence, but there are no signs of prehistoric human occupation on the mountain plateaus. In this case, potential for considerable alteration of a culturally significant relic landscape (i.e. mountain plateau) is considered low. Farming-related building structures (Jan se Plaas) will not be negatively affected by the proposed development. A small historical component is represented by building structures related to early 20th century asbestos mining industry. As for overall potential heritage impact, no fatal flaws were identified. Potential for loss of irreplaceable heritage resources resulting from the development is considered low. The development may proceed provided that the identified historical structures are protected by a 5 m no-go buffer zone.

DURATION OF IMPACT	Permanent (except for Laydown Area)
EXTENT OF IMPACT (or spatial scale/influence of impact)	Local: Within 5 km of the proposed development.
IRREPLACEABLE loss of resources	Low potential for loss of irreplaceable resources.
REVERSIBILITY of impact	Impact cannot be reversed, but lessened with mitigation.
MAGNITUDE of negative impact (at the indicated spatial scale)	Low: Heritage resources incl. relic landscape will not be considerably altered.
PROBABILITY (of occurrence)	Low
CUMULATIVE impacts	Low: The activity is one of several similar past, present or future activities in the same geographical area, but will not contribute to a very significant combined impact on the cultural resources of local, regional or national concern.

Social-Economic Impact Assessment:

The proposed project is expected to result in the following positive impacts:

- Positive impact on job opportunities in the poverty-stricken area, even though the permanent jobs would be limited. It would still generate additional income among some households that previously had to do

without these resources. The lack of skills among the resident population, however, is of concern. It is therefore critical that the project proponent focus on sustainable skills training and capacity building programmes among the local communities to ensure that the number of local employees can be maximised.

- Should the proposed project be able to fill the gap with regards to the quantity and quality of labour available and those required for the project it could assist with improving the quality of life of many households.
- The project proponent could, by being present in the area and by their financial support and social responsibility, assist the Siyathemba Local Municipality to build capacity among local businesses and SME's, as well as assist with the development of infrastructure facilities in the area.

Negative impacts to be noted are the following:

- The inflow of construction workers to the area would have impacts on the local social environment of those living in close proximity to the site as the area is currently scarcely populated and characterized as a peaceful rural environment.
- The population change can result in negative social impacts such as conflict between locals and outsiders, as well as placing additional pressure on the delivery of services and infrastructure requirements.
- The negative intrusion impacts during the construction phase on the neighbouring farmers and are expected to be limited due to the distance of the homesteads to the proposed facility. If no trespassing occur, it is anticipated that their daily living and movement activities would be able to continue undisturbed. Once operational, the facility is anticipated to also have a limited impact on the living and movement patterns of surrounding and nearby property owners.
- Other construction related intrusions refer to the movement of heavy vehicles transporting people, goods and materials, especially the turbines and nacelles. Increased risks of accidents, damage to the gravel road surface and speeding on the local roads are of concern. Noise impacts from the construction activities would be intermittent and of a moderate significance
- The escalation in people movement and presence of workers (and possibly jobseekers) on site could result in increased risks for criminal activities compromising the current safety and security profile of the local communities to some extent.
- Noise impacts and the visual intrusions created by the WEF would be the key concerns from a social perspective.

These impacts will respond to mitigation, although limited mitigation can be achieved to minimise the turbine impacts on the visual environment.

Construction Phase Impacts Significance

Potential Impact	Impact Assessment BEFORE Management		Significance before mitigation	Mitigation Type (Management Objective/ Outcome)	Impact Assessment AFTER Management		Significance after mitigation
Population change impacts	Impact status	Negative	MEDIUM -	Minimise negative impacts related to population influx	Impact status	Negative	LOW -
	Extent	2			Extent	2	
	Magnitude/Intensity	3			Magnitude/Intensity	2	
	Duration	1			Duration	1	
	Consequence	6 (medium)			Consequence	5 (low)	
	Probability	Probable			Probability	Possible	
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	yes			Cumulative impacts	yes	
Community safety impacts	Impact status	Negative	MEDIUM -	Minimise negative impacts on community safety	Impact status	Negative	LOW -
	Extent	2			Extent	2	
	Magnitude/Intensity	3			Magnitude/Intensity	2	
	Duration	1			Duration	1	
	Consequence	6 (medium)			Consequence	5 (low)	
	Probability	Possible			Probability	Possible	
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	yes			Cumulative impacts	yes	
Nuisance factors	Impact status	Negative	LOW -	Minimise negative impacts related to population influx Minimise negative impacts related to nuisance factors	Impact status	Negative	INSIGNIFICANT -
	Extent	2			Extent	2	
	Magnitude/Intensity	2			Magnitude/Intensity	1	
	Duration	1			Duration	1	
	Consequence	5 (low)			Consequence	4 (very low)	
	Probability	Possible			Probability	Possible	

Potential Impact	Impact Assessment BEFORE Management		Significance before mitigation	Mitigation Type (Management Objective/ Outcome)	Impact Assessment AFTER Management		Significance after mitigation
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	no			Cumulative impacts	no	
Job opportunities	Impact status	Positive	LOW+	Minimise negative impacts related to population influx	Impact status	Positive	MEDIUM +
	Extent	2			Extent	2	
	Magnitude/Intensity	2			Magnitude/Intensity	3	
	Duration	1			Duration	1	
	Consequence	5 (low)			Consequence	6 (medium)	
	Probability	Probable			Probability	Probable	
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	yes			Cumulative impacts	yes	
Visual and Impact on Sense of Place	Impact status	Negative	MEDIUM -	Management measures of Visual Impact Assessment must be implemented, limit road construction and vegetation clearance. Attend to lighting	Impact status	Negative	LOW -
	Extent	2			Extent	1	
	Magnitude/Intensity	3			Magnitude/Intensity	2	
	Duration	1			Duration	1	
	Consequence	6 (medium)			Consequence	4 (low)	
	Probability	Probable			Probability	Possible	
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	no			Cumulative impacts	no	
	Cumulative impacts	Negative			Cumulative impacts	Negative	

6.5 Operational Phase Impact Significance

Potential Impact	Impact Assessment BEFORE Management		Significance before mitigation	Mitigation Type (Management Objective/ Outcome)	Impact Assessment AFTER Management		Significance after mitigation
Population change impacts	Impact status	Negative	MEDIUM -	Minimise negative impacts related to population influx	Impact status	Negative	LOW -
	Extent	2			Extent	2	
	Magnitude/Intensity	3			Magnitude/Intensity	2	
	Duration	2			Duration	2	
	Consequence	7 (high)			Consequence	6 (medium)	
	Probability	Possible			Probability	Possible	
	Confidence level	Low			Confidence level	Low	
	Cumulative impacts	yes			Cumulative impacts	yes	
Job and income creation	Impact status	Positive	LOW+-	Maximise local job opportunities	Impact status	Positive	MEDIUM +
	Extent	2			Extent	2	
	Magnitude/Intensity	1			Magnitude	2	
	Duration	3			Duration	3	
	Consequence	6 (medium)			Consequence	7 (high)	
	Probability	Possible			Probability	Possible	
	Confidence level	Low			Confidence level	Low	
	Cumulative impacts	yes			Cumulative impacts	yes	
Community safety impacts	Impact status	Negative	LOW -	Minimise negative impacts on community safety	Impact status	Negative	VERY LOW -
	Extent	2			Extent	2	
	Magnitude/Intensity	1			Magnitude/Intensity	1	
	Duration	2			Duration	2	
	Consequence	5 (low)			Consequence	5 (low)	
	Probability	Possible			Probability	Improbable	
	Confidence level	Medium			Confidence level	Medium	

Potential Impact	Impact Assessment BEFORE Management		Significance before mitigation	Mitigation Type (Management Objective/ Outcome)	Impact Assessment AFTER Management		Significance after mitigation
	Cumulative impacts	no			Cumulative impacts	no	
Impact on values of adjacent properties	Impact status	Negative	LOW -	Limit impacts on property value through proper site management and adherence to EMPr	Impact status	Negative	LOW -
	Extent	1			Extent	1	
	Magnitude/Intensity	3			Magnitude/Intensity	2	
	Duration	2			Duration	2	
	Consequence	6 (medium)			Consequence	5 (low)	
	Probability	Probable			Probability	Possible	
	Confidence level	Low			Confidence level	Low	
	Cumulative impacts	no			Cumulative impacts	no	
Community Development Funds	Impact status	Positive	LOW +	Enhance the positive impact of community development funds	Impact status	Positive	MEDIUM +
	Extent	2			Extent	2	
	Magnitude/Intensity	2			Magnitude/Intensity	3	
	Duration	2			Duration	2	
	Consequence	6 (medium)			Consequence	7 (high)	
	Probability	Possible			Probability	Possible	
	Confidence level	Low			Confidence level	Medium	
	Cumulative impacts	no			Cumulative impacts	no	
Economic Diversity	Impact status	Positive	VERY LOW+-	Create conditions that are conducive to involvement of local entrepreneurs, SMME's and businesses	Impact status	Positive	LOW +
	Extent	2			Extent	2	
	Magnitude/Intensity	1			Magnitude/Intensity	2	
	Duration	2			Duration	2	
	Consequence	5 (low)			Consequence	6 (medium)	
	Probability	Possible			Probability	Possible	

Potential Impact	Impact Assessment BEFORE Management		Significance before mitigation	Mitigation Type (Management Objective/ Outcome)	Impact Assessment AFTER Management		Significance after mitigation
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	yes			Cumulative impacts	yes	
Local resource use	Impact status	Negative	LOW -	Mitigate against water quality and quantity impacts Limit possible impacts on through proper site management and adherence to EMPPr	Impact status	Negative	VERY LOW -
	Extent	1			Extent	1	
	Magnitude/Intensity	2			Magnitude/Intensity	1	
	Duration	2			Duration	2	
	Consequence	5 (low)			Consequence	4 (very low)	
	Probability	Probable			Probability	Probable	
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	no			Cumulative impacts	no	
Contribute to stable, renewable electricity supply	Impact status	Positive	HIGH +	None	Impact status	Positive	HIGH +
	Extent	3			Extent	3	
	Magnitude/Intensity	2			Magnitude/Intensity	2	
	Duration	2			Duration	2	
	Consequence	7 (high)			Consequence	7 (high)	
	Probability	Definite			Probability	Definite	
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	yes			Cumulative impacts	yes	
Visual and Impact on Sense of Place	Impact status	Negative	MEDIUM-	Management measures of Visual Impact Assessment must be implemented, location of wind turbines, maintain	Impact status	Negative	MEDIUM-
	Extent	1			Extent	1	
	Magnitude/Intensity	3			Magnitude/Intensity	3	
	Duration	2			Duration	2	
	Consequence	6 (medium)			Consequence	6 (medium)	

Potential Impact	Impact Assessment BEFORE Management		Significance before mitigation	Mitigation Type (Management Objective/ Outcome)	Impact Assessment AFTER Management		Significance after mitigation
	Probability	Confidence level			Probability	Confidence level	
	Probable	Negative		facilities and turbines, attend to lighting	Possible	Medium	
	1	no					
	Cumulative impacts	no					
Nuisance Factors	Negative	1	LOW -	Mitigation measures of noise impact assessment to be implemented	Negative	1	VERY LOW -
	2	1					
	3	3					
	6 (medium)	5 (low)					
	Possible	Possible					
	Medium	Medium					
	no	no					
	Cumulative impacts	no					

6.6 Decommissioning Phase Impacts

Potential Impact	Impact Assessment BEFORE Management		Significance before mitigation	Mitigation Type (Management Objective/ Outcome)	Impact Assessment AFTER Management		Significance after mitigation
	Impact status				Impact status		
Nuisance factors	Impact status	Negative	VERY LOW -	Mitigate the potential negative contribution of the project towards nuisance factors:	Impact status	Negative	VERY LOW -
	Extent	1			Extent	1	
	Magnitude/Intensity	2			Magnitude/Intensity	1	
	Duration	1			Duration	1	
	Consequence	4 (very low)			Consequence	3 (very low)	
	Probability	Probable			Probability	Probable	
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	no			Cumulative impacts	no	
Job and income losses	Impact status	Negative	MEDIUM-	Mitigate against job losses during closure	Impact status	Negative	LOW -
	Extent	2			Extent	2	
	Magnitude/Intensity	2			Magnitude/Intensity	1	
	Duration	3			Duration	3	
	Consequence	7 (high)			Consequence	6 (medium)	
	Probability	Possible			Probability	Possible	
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	no			Cumulative impacts	no	
Community safety impacts	Impact status	Negative	VERY LOW -	Minimise negative impacts on community safety	Impact status	Negative	VERY LOW -
	Extent	1			Extent	1	
	Magnitude/Intensity	2			Magnitude/Intensity	2	
	Duration	1			Duration	1	
	Consequence	4 (very low)			Consequence	4 (very low)	

Potential Impact	Impact Assessment BEFORE Management		Significance before mitigation	Mitigation Type (Management Objective/ Outcome)	Impact Assessment AFTER Management		Significance after mitigation
	Probability	Probable			Probability	Possible	
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	no			Cumulative impacts	no	

Visual Impact Assessment:

The proposed development will be highly visible within the short distance zone due to the short distance between the observer and the proposed development. Given the design of the proposed wind turbines it offers a low compatibility with the surrounding landscape. The VAC of the study area is considered to be low within the short distance zone as the proposed development will be placed on top of a low mountain coupled with the sparse vegetation cover which predominantly consist of low thicket. The wind turbines, solar farm and the 132 kV Powerline will be visible within the short distance zone. The highest visual impact will occur from National Route Ten (N10) situated three point eight kilometres (3.8 km) towards the northeast, the R357 situated four and a half kilometres (4.5 km) towards the northwest and the R386 situated four point two kilometres (4.2 km) towards the west of the proposed development; however, the visual impact will be temporary from these vantage points due to the fact that observers will only traverse through the study area.

The proposed development will have a high visual impact when observed from the Blockhouse situated within the Koppie Nature Reserve. The blockhouse is the only heritage important structure that will be negatively influenced by the proposed development; however, it must be noted that there are some eight thousand (8 000) blockhouses across South Africa. Furthermore, the blockhouse in question has been vandalised and proof can clearly be seen. The Wind Turbines were predominantly used to determine the visual impact of the proposed development as it is roughly one hundred and fifty metres (150 m) taller than any of the other infrastructure. The relative visibility of the turbines, seen from the Koppie is more or less equal to the silos situated within the foreground. The landscape surrounding Prieska is not considered to be of high scenic nor cultural value as the town owes its origin to the Orange River and the surrounding farms. The proposed development will be an injection to the Local Economy of Prieska and as such the overall moderate visual impact will be acceptable.

Construction Phase:

- Access roads are to be kept clean;
- Site offices and structures should be limited to one location and carefully situated to reduce visual intrusions. Roofs should be grey and non-reflective;
- Construction camps as well as development areas should be screened with netting;
- Lights within the construction camp should face directly down (angle of 90°);
- Vegetation clearance should be limited to the development footprint only;
- Litter should be strictly controlled, as the spread thereof through wind could have a very negative visual impact;
- All areas disturbed by construction activities must be subject to landscaping and rehabilitation;
- All spoil and waste will be disposed to a registered waste site and certificates of disposal provided;
- The project must be timed so that rehabilitation can take place at the optimal time for vegetation establishment;
- Signage, if essential, should be discrete and confined to entrance gates. No corporate or advertising signage should be permitted.
- Avoid shiny materials in structures. Where possible shiny metal structures should be darkened or screened to prevent glare; and,
- Mitigation of visual impacts associated with the construction phase would entail proper planning, management and rehabilitation of the construction site. Mitigation measures include the following:
 - Reduce the time of construction through careful planning of logistics and ensure the productive implementation of resources;
 - Limit disturbance of the environment to the development footprint; and,
 - Limit construction activities to business hours (07:00 – 17:00).

Operation Phase:

- Avoid shiny materials in structures. Where possible shiny metal structures should be darkened or screened to prevent glare;
- Litter should be strictly controlled, as the spread thereof through wind could have a very negative visual impact;
- Mitigation to minimise lighting impacts include the following:

- Shielding the sources of light by physical barriers (walls, vegetation or structures itself);
- Limit mounting heights of lighting fixtures, or alternatively using foot-lights or bollard level lights);
- Make use of downward directional lighting fixtures;
- Make use of minimum lumen or wattage in lights;
- The navigation light at the top of the mast must be shielded to prevent disturbance to adjacent landowners;
and,
- Use motion sensors to activate lighting ensuring light is available when needed.
- Rehabilitation and Post-closure measures:
 - All above-ground structures should be removed, safely disposed of or possibly recycled for use elsewhere;
and,
 - The affected area should be regarded to pre-development topographic conditions, unless the area is required for new specific uses.

Construction Phase Impacts within 10km radius

Planning, design and construction phase	Design Alternative 1		No-Go Alternative
	Before Mitigation	After Mitigation	
POTENTIAL VISUAL IMPACTS:			
Nature of impact: Impact on the sense of place for surrounding users.	Activity: The movement of construction vehicles, machinery and personnel on site shall result in a visual impact on surrounding users. Furthermore to this, the storage of materials and excavation shall result in disturbance and an unsightly character.		No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Duration:	2	2	-
Extent:	2	1	-
Intensity:	2	2	-
Probability:	1	1	-
Total SP:	6	5	-
Significance rating:	Low (L)	Low (L)	-
Cumulative impact:	-	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> • Access roads are to be kept clean; • Site offices and structures should be limited to one location and carefully situated to reduce visual intrusions. Roofs should be grey and non-reflective; • Construction camps as well as development areas should be screened with netting; • Lights within the construction camp should face directly down (angle of 90°); • Vegetation clearance should be limited to the development footprint only; • Litter should be strictly controlled, as the spread thereof through wind could have a very negative visual impact; • All areas disturbed by construction activities must be subject to landscaping and rehabilitation; • All spoil and waste will be disposed to a registered waste site and certificates of disposal provided; • The project must be timed so that rehabilitation can take place at the optimal time for vegetation establishment; • Signage, if essential, should be discrete and confined to entrance gates. No corporate or advertising signage should be permitted. 		N/A

Planning, design and construction phase	Design Alternative 1		No-Go Alternative
	Before Mitigation	After Mitigation	
	<ul style="list-style-type: none"> Avoid shiny materials in structures. Where possible shiny metal structures should be darkened or screened to prevent glare; and, Mitigation of visual impacts associated with the construction phase would entail proper planning, management and rehabilitation of the construction site. Mitigation measures include the following: <ul style="list-style-type: none"> Reduce the time of construction through careful planning of logistics and ensure the productive implementation of resources; Limit disturbance of the environment to the development footprint; and, Limit construction activities to business hours (07:00 – 17:00). 		

Operational Phase Impacts within 5km radius

Operational Phase	Design Alternative 1	No-Go Alternative
POTENTIAL VISUAL IMPACTS:		
Nature of impact: Impact on the sense of place for surrounding users.	Activity: The development of the Prieska Power Reserve can cause a visual intrusion to observers within a five-kilometre (5 km) radius from the proposed development.	No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Duration:	5	5
Extent:	3	0
Intensity:	4	0
Probability:	4	5
Total SP:	48	25
Significance rating:	High (H)	P (+)
Cumulative impact:	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> Avoid shiny materials in structures. Where possible shiny metal structures should be darkened or screened to prevent glare; Litter should be strictly controlled, as the spread thereof through wind could have a very negative visual impact; 	N/A

Operational Phase	Design Alternative 1	No-Go Alternative
	<ul style="list-style-type: none"> • Mitigation to minimise lighting impacts include the following: <ul style="list-style-type: none"> • Shielding the sources of light by physical barriers (walls, vegetation or structures itself); • Limit mounting heights of lighting fixtures, or alternatively using foot-lights or bollard level lights); • Make use of downward directional lighting fixtures; • Make use of minimum lumen or wattage in lights; • The navigation light at the top of the mast must be shielded to prevent disturbance to adjacent landowners; and, • Use motion sensors to activate lighting ensuring light is available when needed. • Rehabilitation and Post-closure measures: <ul style="list-style-type: none"> • All above-ground structures should be removed, safely disposed of or possibly recycled for use elsewhere; and, • The affected area should be regarded to pre-development topographic conditions, unless the area is required for new specific uses. 	

Operational Phase Impacts within 10km radius

Operational Phase	Design Alternative 1	No-Go Alternative
POTENTIAL VISUAL IMPACTS:		
Nature of impact: Impact on the sense of place for surrounding users.	Activity: The development of the Prieska Power Reserve can cause a visual intrusion to observers within a ten-kilometre (10 km) radius from the proposed development.	No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Duration:	5	5
Extent:	3	0
Intensity:	3	0
Probability:	4	5
Total SP:	44	25

Operational Phase	Design Alternative 1	No-Go Alternative
Significance rating:	Moderate-High (MH)	P (+)
Cumulative impact:	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> Please refer to Mitigation Measures listed above. 	N/A

Operational Phase Impacts within 20km radius

Operational Phase	Design Alternative 1	No-Go Alternative
POTENTIAL VISUAL IMPACTS:		
Nature of impact: Impact on the sense of place for surrounding users.	Activity: The development of the Prieska Power Reserve can cause a visual intrusion to observers within a twenty-kilometre (20 km) radius from the proposed development.	No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Duration:	4	5
Extent:	3	0
Intensity:	3	0
Probability:	40	5
Total SP:	14	25
Significance rating:	Moderate-High	P (+)
Cumulative impact:	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> Please refer to Mitigation Measures listed above. 	N/A

Operational Phase Impacts within 30km radius

Operational Phase	Design Alternative 1	No-Go Alternative
POTENTIAL VISUAL IMPACTS:		
Nature of impact: Impact on the sense of place for surrounding users.	Activity: The development of the Prieska Power Reserve can cause a visual intrusion to observers within a thirty-kilometre (30 km) radius from the proposed development.	No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Duration:	4	5
Extent:	3	0
Intensity:	2	0
Operational Phase	Design Alternative 1	No-Go Alternative
Probability:	2	5
Total SP:	18	25
Significance rating:	Moderate	P (+)
Cumulative impact:	-	-
Proposed Mitigation:	Please refer to Mitigation Measures listed above.	N/A

7 ASSESSMENT OF POTENTIAL IMPACTS

The issues and impacts presented in this chapter have been identified via baseline assessment of the receiving environment (environmental, social and heritage features present on site – as discussed in **Chapter 6** of this EIR), a review of environmental impacts from other similar projects and input from specialists that form part of the EIA project team.

The proposed PV Solar Plant and associated infrastructure is anticipated to impact on a range of aspects of the biophysical and socio-economic environment. One of the main purposes of the EIA process is to understand the significance of these potential impacts and to determine if the potential impacts can be mitigated or minimised. Potential impacts identified as part of the EIA are anticipated to occur during the construction and operational of the development. While some impacts may occur during the decommissioning phase of development, these are anticipated to be similar to those associated with the construction phase of development but of lower significance.

Mitigation measures proposed for the identified impacts proposed herein are the result of an interactive process that took place between the environmental impacts prediction and the Specialist and planning design team. Based on the identified environmental impacts results, further mitigation measures are incorporated into the design of the project to ensure the protection of the physical, biological and human environments. The main aim of these mitigation measures is to:

- protect the physical, biological, and human environments; and
- provide the basis for the development of monitoring plans.

For this proposed project, impacts have been identified, both environmental and socio-economic. The mitigation measures proposed herein are means to prevent, reduce or control the impact effects, and include restitution for any damage to the environment caused by these effects through replacement, restoration, compensation or any other means.

7.1 Method of environmental assessment

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 30: 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 31.

Table 31: 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 32 below.

Table 32: 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 33 below.

Table 33: 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 34 below.

Table 34: 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 EMP 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.

7.2 Potential impacts

- **Biodiversity (terrestrial) Impacts**
 - Transformation of vegetation.
 - Loss of biodiversity and damage to ecological function and integrity.
 - Destruction of-/damage to Red Data Listed, nationally or provincially protected species individuals/habitats associated with the assessment area.
 - Surface material erosion.
 - Dust generation and emissions.
 - Impeding and contamination of the flow regimes of the water drainage lines/areas and the associated broad surface water catchment- and drainage areas; and
 - Over-utilisation of potable water during construction.

See Section 6 for impact significance calculation

- **Avifauna Impacts**

- Displacement of priority species due to disturbance associated with construction of the Wind Turbines and associated infrastructure.
- Displacement of priority species due to habitat transformation associated with construction of the Wind Turbines and associated infrastructure.
- Mortality of priority species due to collisions.
- Mortality of priority species due to collisions with the 132kV powerline.
- Displacement of priority species due to disturbance associated with decommissioning of the Wind Facility and associated infrastructure.
- Displacement of priority species due to disturbance associated with construction of the 132kV overhead power line.

See Section 6 for impact significance calculation

- **Bats Impacts**

- Roost disturbance and/or destruction due to construction activities;
- Bat fatalities due to collision with or barotrauma caused by wind turbines while foraging or migrating.

See Section 6 for impact significance calculation

- **Palaeontology, Archaeology and Heritage Impacts**

- Potential direct impacts to historical and archaeological resources.
- Potential direct impact to palaeontological resources.

- **Air Quality**

Dust and emissions are generated during construction activities such as debris handling and debris piles, truck transport, bulldozing, and general construction. This is most likely to be a nuisance.

Construction phase:

- During construction and installation of service infrastructure and turbines, there may be a localized and temporary reduction in air quality as a result of dust and particulate generation.
- Air quality will also be reduced by emissions from machinery and vehicles used for transportation to and from the site and on the site.

- **Noise impacts**

Noise pollution may be increased during site preparation and construction activities. Impacts could result from the following environmental aspects:

Construction phase:

- Creation of access, transmission line and wind turbines.
- Transport and equipment use.

- **Visual Impacts**

The turbines and blade movement and associated infrastructure will be in an area that is set in a rural setting.

- Visual intrusion to views sensitive of visual receptors.
- Night lighting. Visual intrusion to the views of sensitive visual receptors.

See Section 6 for impact significance calculation

▪ **Traffic Generation Impacts**

During all phases (construction, and operation) 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 to the site, as well as the transportation of employees to and from the site on a daily basis.

▪ **Social-Economic Impacts**

- Population changes impacts.
- Community safety impacts.
- Nuisance factors.
- Job opportunities.
- Impact on values of adjacent properties.
- Community Development Funds.
- Economic Diversity.
- Local resource use.

See Section 6 for impact significance calculation

The proposed mitigation measures for the identified effects for the various disciplines of the physical, biological and human environment are summarised in the tables below.

7.3 Construction phase impacts

Traffic Generation impacts	Assessment Area
Identified Environmental Impact	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.
Extent of Negative or Positive Impact	Local (1)
Intensity of the Negative or Positive Impact	Low (1)
Duration of Negative or Positive Impact	Long-term (3)
Consequence rating	Low (5)
Probability of Impact Occurrence	Possible
Impact Significance Rating prior to mitigation	Low
Status of impact, positive or negative	Negative
Confidence in the assessment	High
Mitigation Measures to be implemented	None

Traffic Generation impacts	Assessment Area
Impact Significance Rating after mitigation implementation	Low

Air/Dust pollution	Assessment Area
Identified Environmental Impact	During construction and upgrading of internal roads and installation of service infrastructure, there may be a localized and temporary reduction in air quality as a result of dust and particulate generation. Air quality will also be reduced by emissions from machinery and vehicles used for transportation to and from the site and on the site.
Extent of Negative or Positive Impact	Local (2)
Intensity of the Negative or Positive Impact	Medium (2)
Duration of Negative or Positive Impact	Short-term (1)
Consequence rating	Low (5)
Probability of Impact Occurrence	Probable
Impact Significance Rating prior to mitigation	Low
Status of impact, positive or negative	Negative
Confidence in the assessment	High
Mitigation Measures to be implemented	<ul style="list-style-type: none"> • Implement suitable dust management and prevention measures during the construction phase. • Construction roads and camps must be adequately wetted-down on a continual basis. • The water being used for wetting-down areas must be of sufficient quality in order to prevent significant contamination of the surrounding areas. • Areas within and immediately surrounding the proposed development footprints must be adequately rehabilitated as soon as practicably possible after construction in order to prevent significant dust emissions. • Ensure strict enforcement of on-site speed limit regulations.
Impact Significance Rating after mitigation implementation	Very Low

Noise pollution	Assessment Area
Identified Environmental Impact	Impact on the surrounding residents due to noise from construction activities and construction vehicle movement.
Extent of Negative or Positive Impact	Local (2)
Intensity of the Negative or Positive Impact	Medium (2)
Duration of Negative or Positive Impact	Short-term (1)
Consequence rating	Low (5)
Probability of Impact Occurrence	Probable

Noise pollution	Assessment Area
Impact Significance Rating prior to mitigation	Low
Status of impact, positive or negative	Negative
Confidence in the assessment	High
Mitigation Measures to be implemented	<ul style="list-style-type: none"> • Construction activities should be restricted to daytime • All relevant noise related legislation and regulations must be implemented that control noise pollution. • Applicable standards that regulate noise emissions must be adhered to. The following noise related legislation must be consulted: • GNR.154 of January 1992: Noise control regulations in terms of section 25 of the Environment Conservation Act (ECA), 1989 (Act No. 73 of 1989); • GNR.155 of 10 January 1992: Application of noise control regulations made under section 25 of the Environment Conservation Act, 1989 (Act No. 73 of 1989); • SANS 10103:2008 Version 6 - The measurement and rating of environmental noise with respect to annoyance and to speech communication; • SANS 10210, Calculating and predicting road traffic noise; • SANS 10328, Methods for environmental noise impact assessments; and • SANS 10357, the calculation of sound propagation by the Concave method.
Impact Significance Rating after mitigation implementation	Very Low

Operational Phase

Traffic Generation impacts	Assessment Area
Identified Environmental Impact	The transportation of employees to and from the site can increase risk for traffic road accidents.
Extent of Negative or Positive Impact	Local (2)
Intensity of the Negative or Positive Impact	Low (1)
Duration of Negative or Positive Impact	Long-term (3)
Consequence rating	Medium (6)
Probability of Impact Occurrence	Probable
Impact Significance Rating prior to mitigation	Low
Status of impact, positive or negative	Negative
Confidence in the assessment	High
Mitigation Measures to be implemented	<ul style="list-style-type: none"> • Standard road use safety rules must be followed.
Impact Significance Rating after mitigation implementation	Low

7.4 Cumulative Impacts

The EIA Regulations (as amended in 2017) determine that cumulative impacts, *“in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities.”* Cumulative impacts can be incremental, interactive, sequential or synergistic.

The term "Cumulative Effect" has for the purpose of this report been defined as: the summation of effects over time which can be attributed to the operation of the Project itself, and the overall effects on the ecosystem of the Project Area that can be attributed to the Project and other existing and planned future projects.

7.4.1 Geographical area of evaluation

The geographic area of evaluation is the spatial boundary in which the cumulative effects analysis was undertaken. The spatial boundary evaluated in this cumulative effects analysis generally includes an area of a 30km radius surrounding the proposed development – refer to figure below.

As previously indicated the locality of renewable projects (affected properties) which are authorised are listed in Table 35 and shown in Figure 26.

Table 35: Renewable energy projects that have been approved within a 30km radius around the proposed PV 1 project (Source: Department of Forestry, Fisheries and the Environment).

Project name	Applicant	DAERL 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	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	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, Northern Cape	Mahoebe Eiendomme BPK	14/12/16/3/3/1/1475	Approved
Proposed 75MW IPMS Solar power plant in Prieska, Northern Cape	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	Networx Renewables (Pty) Ltd	14/12/16/3/3/2/579/1	Approved

<p>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, Northern Cape</p>	<p>Camel Thorn Solar Power Plant (RF) (Pty) Ltd</p>	<p>14/12/16/3/3/2/937</p>	<p>Approved</p>
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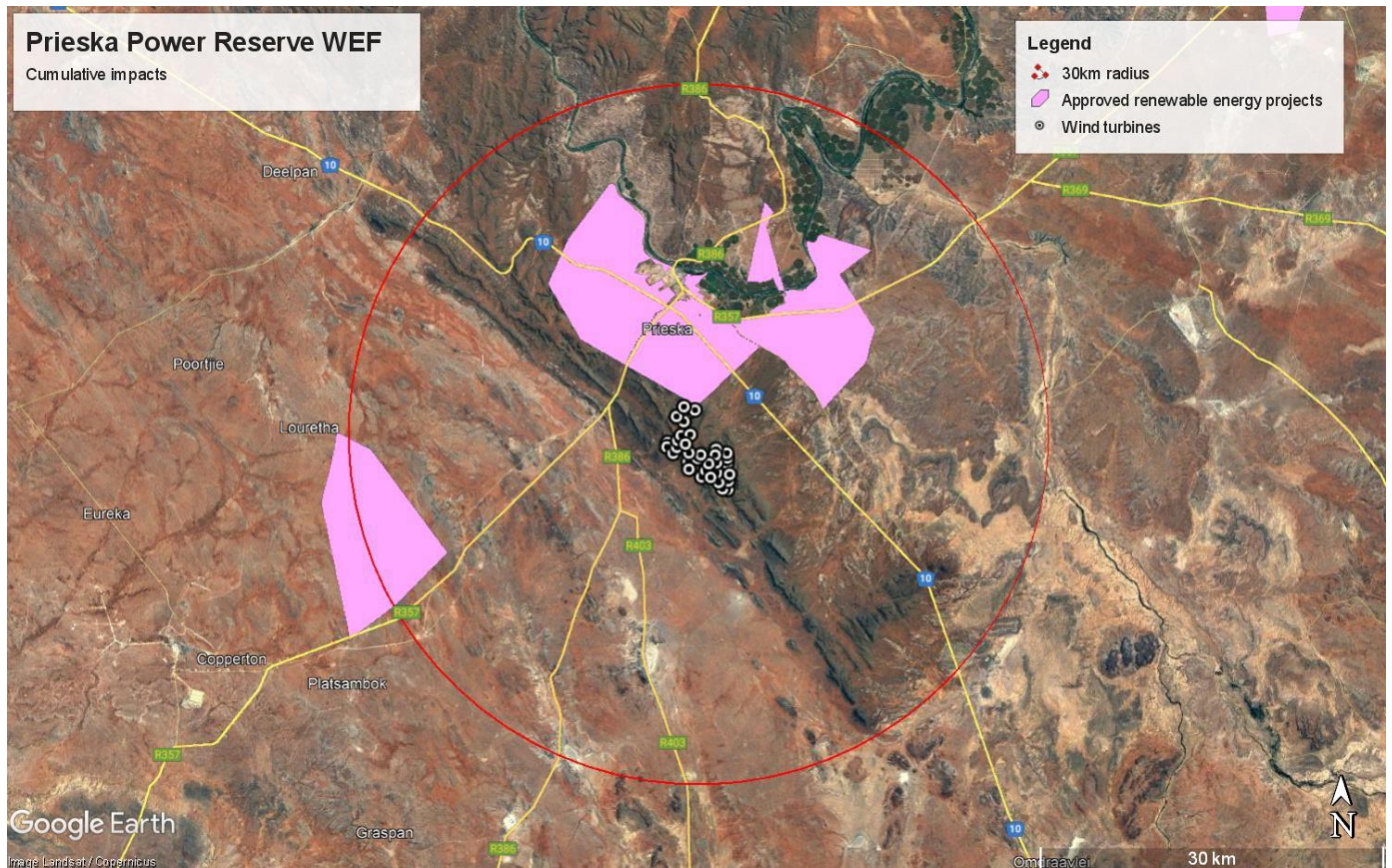


Figure 26: Approved Renewable Energy Projects within a 30km radius around the proposed WEF

The total affected land parcel area taken up by authorised renewable energy projects within the 30km radius (all solar PV) is approximately 260km², although the actual area affected by the solar facilities is likely to be 20% or less of the land parcel area, i.e. ~52 km². The total area affected by the proposed Prieska Power Reserve WEF project equates to ~10 km². The combined area affected by authorised renewable energy developments within the 30 km radius around the proposed WEF, including the proposed WEF, thus equals ~62 km². Of this, the proposed WEF project constitutes ~16%. The contribution of the proposed WEF to the cumulative impact of the renewable energy projects is thus anticipated to be **medium** after mitigation.

The total area of natural habitat within the 30km radius around the proposed projects equates to about 2 691km² (excluding urban areas and irrigated agriculture). The total combined size of the area potentially affected by renewable energy projects will thus equate to ~2.3% of the available untransformed habitat in the 30km radius, should all the projects be constructed. However, each of these projects must still be subject to a competitive bidding process where only the most competitive projects will win a power purchase agreement required for the project to

proceed to construction. The cumulative impact of all the proposed renewable energy projects is thus estimated to affect a maximum of ~2.3% or less of the available untransformed habitat, resulting in a **low** impact.

8 DESCRIPTION OF KEY ASSUMPTIONS AND KNOWLEDGE GAPS

In undertaking this investigation and compiling the EIR, it has been assumed that:

- ✓ The information provided by the project proponent and specialists is accurate and unbiased.
- ✓ The scope of this investigation is limited to assessing the environmental impacts associated with the proposed development and associated infrastructure.
- ✓ Should the proposed project be authorised, the Developer will incorporate the recommendations and mitigation measures outlined in the specialists' investigations and the final EIA Report for the Wind Energy Facility and its associated infrastructure.

9 CONCLUSION AND RECOMMENDATIONS

The findings of the studies undertaken within this EIA to assess both the benefits and potential negative impacts anticipated from the proposed development conclude that:

- ✓ There are no further environmental fatal flaws that should prevent the development of the Wind Energy facility with its associated infrastructure provided that:
 - The recommendations provided are considered.
 - The recommended mitigation and management measures in the EIA and EMPr are implemented and given due consideration during the formalisation process.
- ✓ Based on the findings of the specialist studies the proposed project is considered to have an overall low to very low negative environmental impact and an overall high positive impact (with the implementation of respective mitigation and enhancement measures).
- ✓ The cumulative significance of all the negative potential impacts on the natural environment is considered low.
- ✓ The social significance is seen as positive based on the fact that the development is likely to contribute towards socio-economic development within the region.

The outcome of this project therefore succeeds in meeting the environmental management objectives of protecting the ecologically sensitive areas and supporting sustainable development and the use of natural resources, whilst promoting justifiable socio-economic development in the towns nearest to the project site. The findings of this EIA show that all natural resources will be used in a sustainable manner (i.e. this project is a renewable energy project and the majority of the negative site specific and cumulative environmental impacts are considered to be of low significance with mitigation measures implemented), while the benefits from the project will promote justifiable economic and social development.

In order to ensure the effective implementation of the mitigation and management actions, an EMPr has been compiled and is included in Part B of this Draft EIA Report. The mitigation measures necessary to ensure that the project is planned, constructed, operated and decommissioned in an environmentally responsible manner are listed in this EMPr. The EMPr is a dynamic document that should be updated regularly and provide clear and implementable measures for the establishment and operation of the proposed WEF. Taking into consideration the findings of the EIA process and given the national and provincial strategic requirements for renewable energy development, it is the opinion of the EAP that the project benefits outweigh the costs and that the project will make a positive contribution to steering South Africa on a pathway towards sustainable renewable energy development. Provided that the specified mitigation measures are applied effectively, it is recommended that the project receive EA in terms of the 2014 EIA Regulations (as amended on 7 April 2017) promulgated under the NEMA.

Recommendations of EAP:

The final recommendation by the EAP considered firstly if the legal requirements for the EIA process had been met and secondly the validity and reliability of the substance of the information contained in the EIA report. In terms of the legal requirements, it is concluded that:

- The scoping phase complied with the agreement and specification set out in Regulation 21 and Appendix 2 EIA Regulations (as amended in 2017) – has already been approved by the environmental authority.
- All key consultees have been consulted as required by Chapter 6 of the EIA Regulations (as amended in 2017) - already approved by the environmental authority.
- The EIA process has been conducted as required by the EIA Regulations (as amended in 2017), Regulations 23 and Appendix 3.

- The EMPr has been compiled in accordance with Appendix 4 of the EIA Regulations (as amended in 2017).
- The proposed mitigation measures will be sufficient to mitigate the identified impacts to an acceptable level.

In terms of the contents and substance of the EIA report the EAP is confident that:

- All key environmental issues were identified during the scoping phase. These key issues were adequately assessed during this EIA phase to provide the environmental authority with sufficient information to allow them to make an informed decision.

Final recommendations of the EAP:

- ✓ Implementation of the proposed mitigation measures set out in the EMPr.
- ✓ Implementation of the proposed mitigation measures set out in the specialist studies.
- ✓ The proposed wind facility must comply with all relevant national environmental laws and regulations.
- ✓ All actions and task allocated in the EMPr should not be neglected and a copy of the EMPr should be made available onsite at all times.
- ✓ Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.
- ✓ Applicant to liaise with the Department of, Forestry and Fisheries & Environment and the Provincial Department of Environment Affairs Northern Cape regarding condition for the issuing the Forest Act License and Biodiversity Permit.
- ✓ Turbine placement of turbine B10 situated within 200meters of a waterpoint be mitigated by migrating the artificial water point further south-east outside the 200m bird buffer zone.
- ✓

10 **I**MPACT STATEMENT

It is the opinion of the independent EAP that the proposed development will have a net positive impact for the area and will subsequently ensure the optimal utilisation of resources. All negative environmental impacts can further be effectively mitigated through the proposed mitigation measures. Based on the contents of the report it is proposed that an environmental authorisation be issued, which states (amongst other general conditions) that the Prieska Power Reserve Phase 3: Wind Turbines & Associated Infrastructure be approved.

11 REFERENCES

- Crime Stats SA. (2020). <https://www.crimestatssa.com/>
- Climate-data.org. (2022). <https://en.climate-data.org/>
- Clean Energy Ministerial and International Renewable Energy Agency. (2014). *The socio-economic benefits of large-scale solar and wind: an econValue report.*
- Collins, N.B. 2016. Biodiversity Plan v1.0, Free State Province, Technical Report, (FSDETEA/BPFS/2016_1.0)
- CSIR, 2020. PhASE 2 Strategic Environmental assessment for Wind and Solar Photovoltaic Energy in South Africa
- Department of Energy. (2019), Connigarth (2019), Stats SA (2018), *Conservation of Agricultural Resources Act (Act 43 of 1983).*
- Maia, J., Giodano, 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., and Swanepoel, J. (2011). *Green Jobs: An estimate of the direct employment potential of a greening South African economy.*
- Mucina, L. and Rutherford, M.C. (2006). *The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19.* South African National Biodiversity Institute: Pretoria.
- Municipal Demarcation Board. (2018). <https://www.demarcation.org.za/>
- New Climate Institute, and Climate Analytics. (2019). *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). <http://www.ncpt.gov.za/>
- South African Government. *National Environmental Management Act (Act 107 of 1998)*
- South African Government. *National Environmental Management: Biodiversity Act (Act 10 of 2004)*
- South African Government. *National Environmental Management: Biodiversity Act (Act 10 of 2004); Alien and Invasive Species Regulations, 2014*
- South African Government. *National Environmental Management: Biodiversity Act (Act 10 of 2004); National list of ecosystems that are threatened and in need of protection, Government Gazette No 34809, 9 December 2011*
- South African Government. *National Forests Act (Act 84 of 1998)*
- South African Government. *National Water Act (Act 36 of 1998)*
- South African heritage Resources Agency. (2021). *Palaentosenstivity map.* <https://sahris.sahra.org.za/map/palaeo>
- Stats SA. (2019) (b). *National Poverty Lines.* <http://www.statssa.gov.za/publications/P03101/P031012019.pdf>
- Stats SA. (2011) *Census.* https://www.statssa.gov.za/?page_id=3839

Stats SA. (2016) *Community Survey*. https://www.statssa.gov.za/?page_id=6283

Topographic-map.com. (2022). <https://en-za.topographic-map.com/maps/77oq/Prieska/>

APPENDIXES

Prieska Power Reserve Phase 3: Wind Energy Facility & Associated Infrastructure

DAERL Ref.: NC/EIA/11/PIX/SIY/PR14/2022



GREEN-BOX
CONSULTING

APPENDIX A: EAP CURRICULUM VITAE AND SIGNED DECLARATION

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	<ul style="list-style-type: none"> • Review Environmental Impact Assessments • Review Environmental Management Programmes • Issuing Environmental Authorisations

DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

PROJECT TITLE

Prieska Rower Reserve Wind Energy Facility

1. ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) INFORMATION

EAP Company Name:	Green-Box Consulting			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	Level 4 EME	Percentage Procurement recognition	100%
EAP name:	Danie Krynauw			
EAP Qualifications:	Master in Environmental Management (Dissertation pending) Masters in Urban and Regional Planning BA in Geography and Sociology			
Professional affiliation/registration:	Registered EAP - EAPASA 2019/1348; International Association of Impact Assessment South Africa (IAIAsa)			
Physical address:	51 Willie du Plessis Fichardtpark Bloemfontein			
Postal address:	P.O. Box 37738 Langenhovenpark			
Postal code:	9301	Cell:	082 435 2108	
Telephone:	-	Fax:	-	
E-mail:	danie@green-box.co.za			

The appointed EAP must meet the requirements of Regulation 13 of GN R982 of 04 December 2014, as amended.

2. DECLARATION BY THE EAP

I, Danie Krynauw, declare that –

- I act as the independent environmental assessment practitioner in this application;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I will take into account, to the extent possible, the matters listed in Regulation 13 of the Regulations when preparing the application and any report relating to the application;
- I undertake to disclose to the applicant and the Competent Authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the Competent Authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the Competent Authority, unless access to that information is protected by law, in which case it will be indicated that such information exists and will be provided to the Competent Authority;
- I will perform all obligations as expected from an environmental assessment practitioner in terms of the Regulations; and

- I am aware of what constitutes an offence in terms of Regulation 48 and that a person convicted of an offence in terms of Regulation 48(1) is liable to the penalties as contemplated in Section 49B of the Act.

Disclosure of Vested Interest (~~delete whichever is not applicable~~)

I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;

~~I have a vested interest in the proposed activity proceeding, such vested interest being:~~

Danie Krynauw

Signature of the Environmental Assessment Practitioner:

Green-Box Consulting

Name of Company:

22 November 2022

Date:

3. UNDERTAKING UNDER OATH / AFFIRMATION

I, Danie Krynauw, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.



Signature of the Environmental Assessment Practitioner

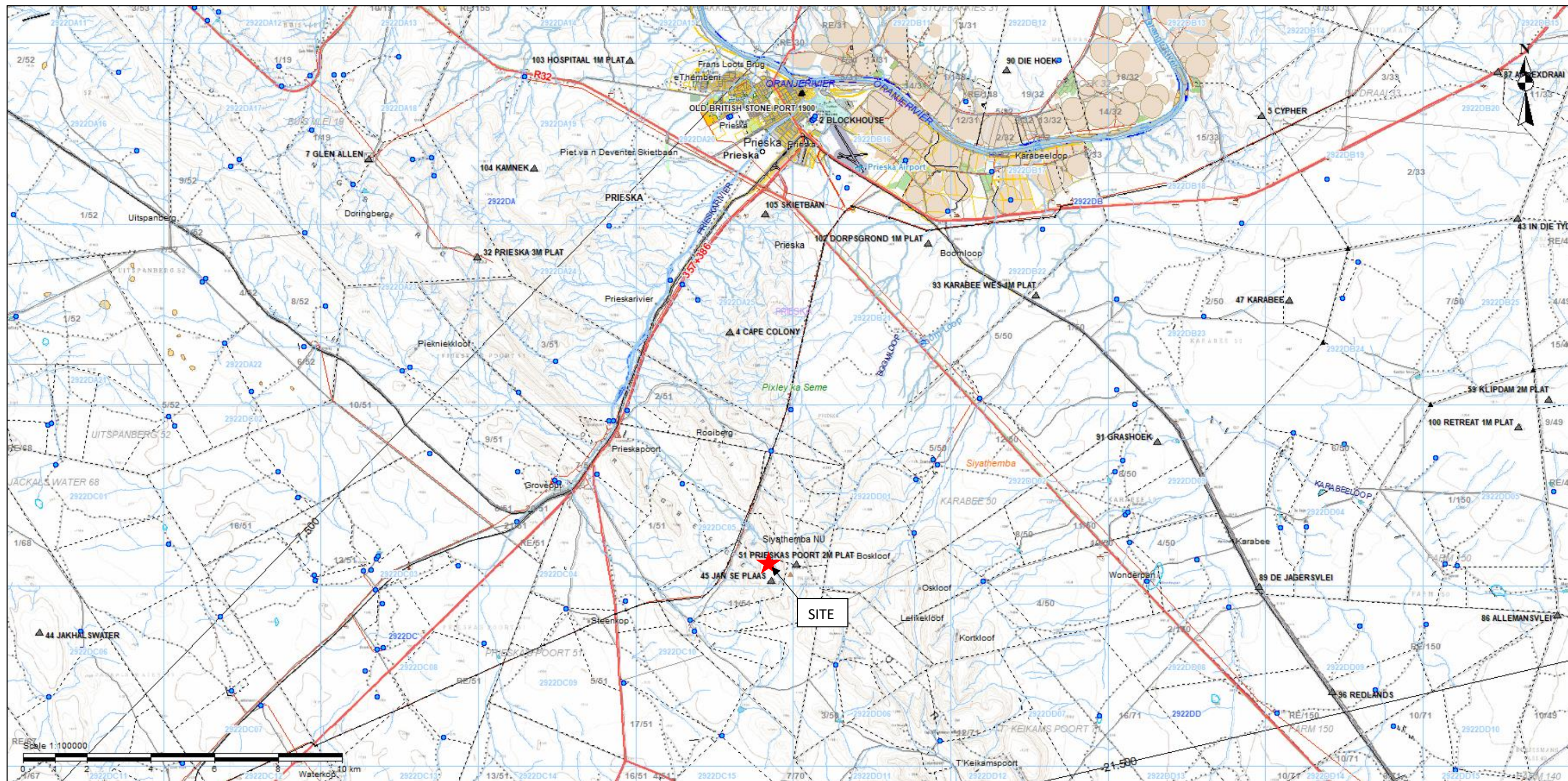
Green-Box Consulting

Name of Company

22 November 2022

Date

APPENDIX B: LOCALITY MAPS



Location Map: Prieska Power Reserve Wind Energy Facility



Aerial Image Map: Prieska Power Reserve Wind Facility earmarked areas

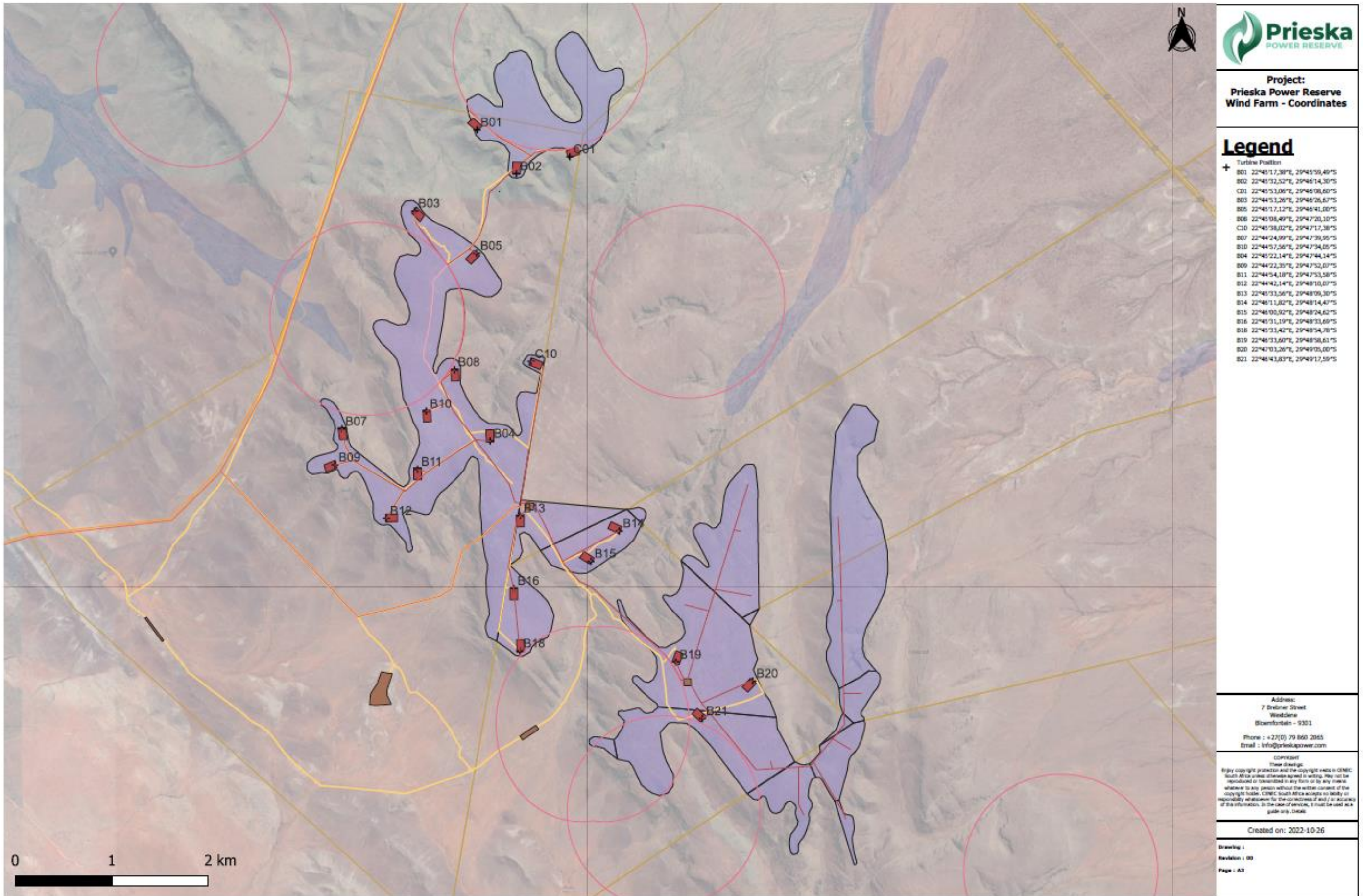


Image of the turbine placement, Northern areas

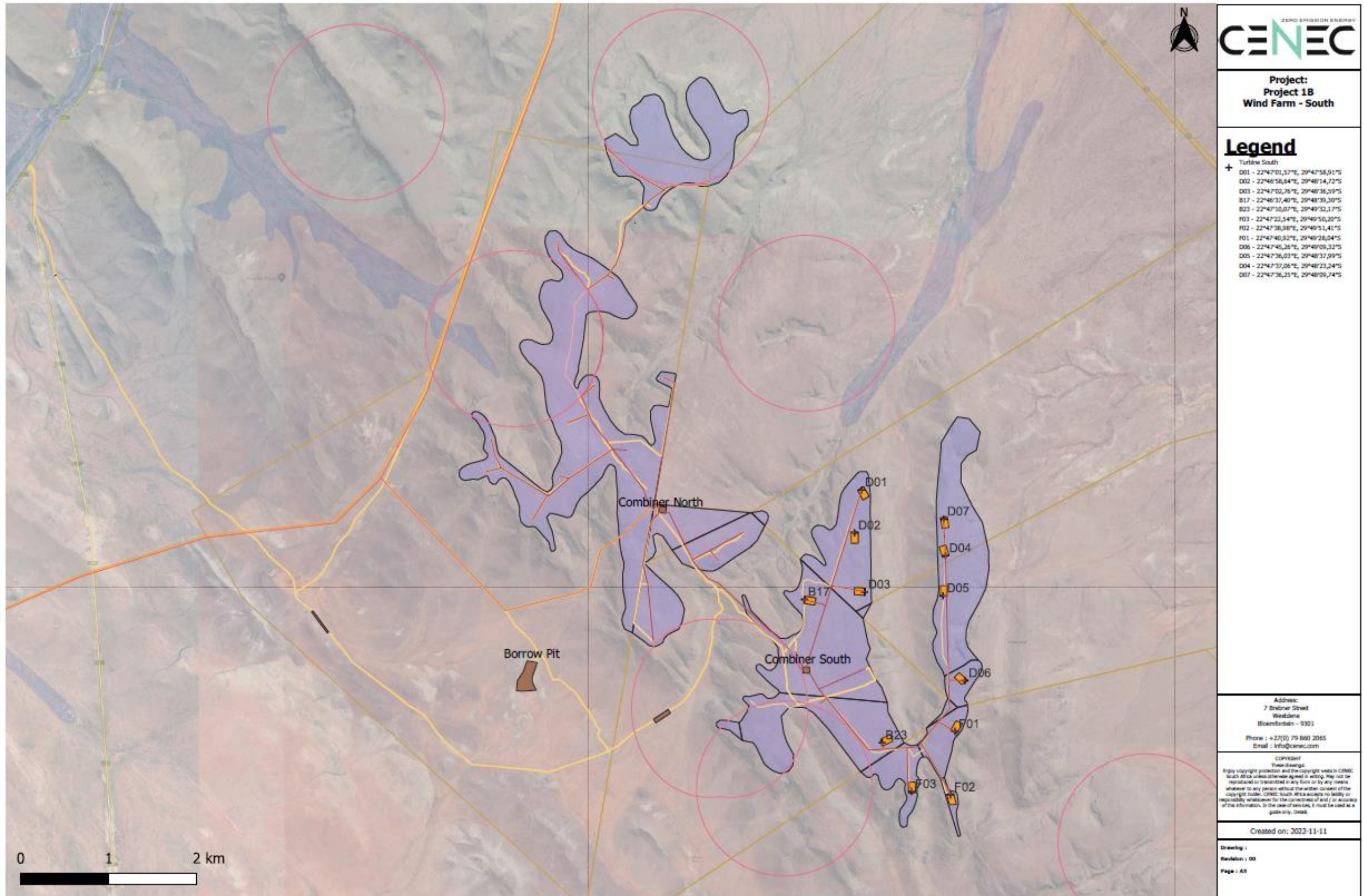


Image of the turbine placement, Southern areas

Prieska Power Reserve Wind Energy Facility

Infrastructure Map

Legend

- 33kW connection lines
- Access roads
- Combiner
- individual
- Internal roads
- Laydown area
- Security corridor
- Transmission line - 132 kV
- Turbine laydown areas

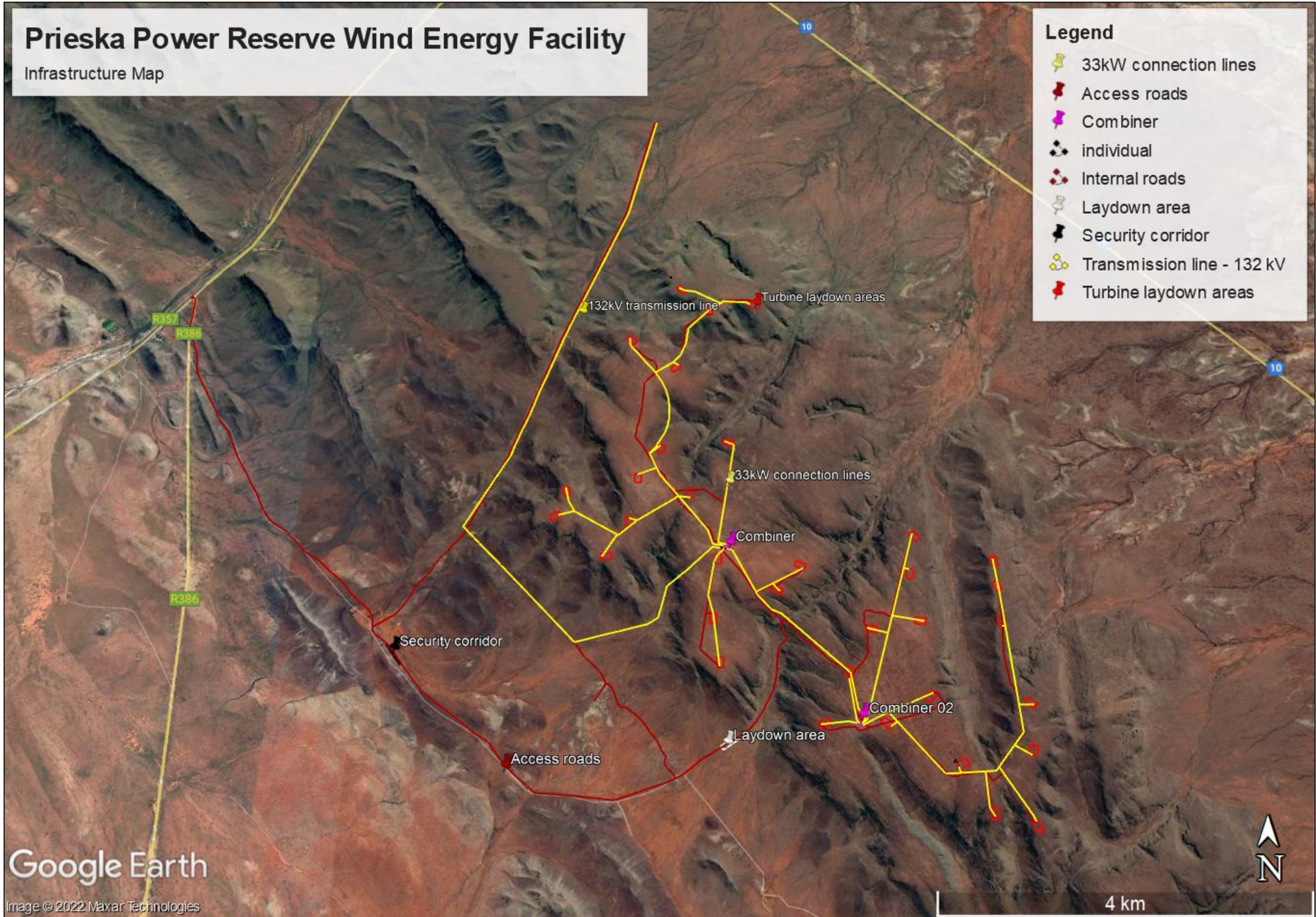


Image of infrastructure placement

APPENDIX C: SITE PHOTOS



Photo 1: Image illustrating cliffs of the mountaintop plateaus



Photo 2: Images illustrating examples of the flat to slightly undulating grassy karroid shrubland landscape, associated with the three mountaintop plateaus



Photo 3: Image illustrating the existing farm tracks associated with the proposed main site assess/service road route



Photo 4: Image illustrating example of a smaller ephemeral water drainage line/preferential flow path



Photo 4: Image of the mountaintop plateaus; the increased soil surface rockiness and slope gradient as well as the increased presence of the provincially protected species *Euphorbia avasmontana*

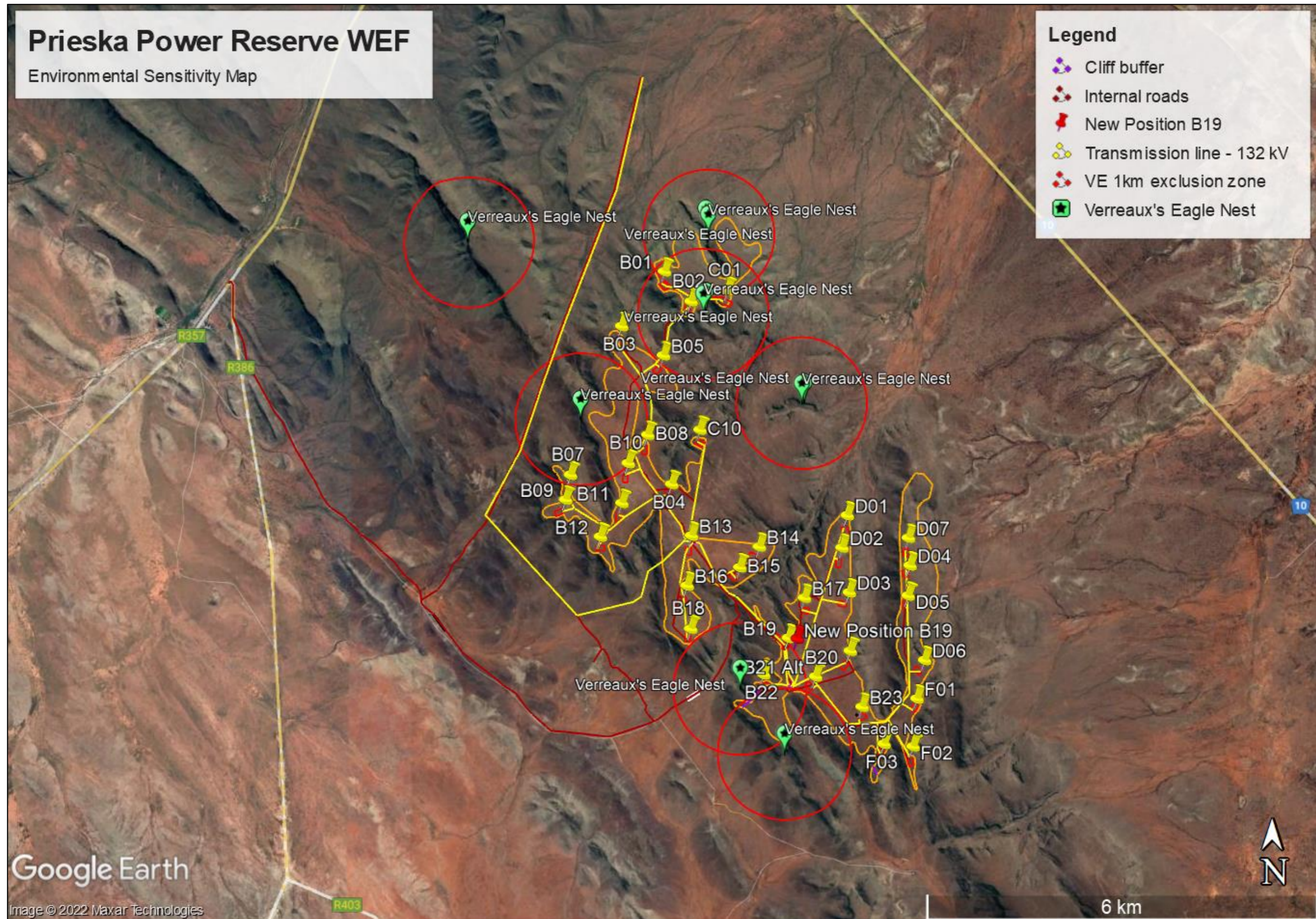
APPENDIX D: FACILITY ILLUSTRATION SENSITIVITY MAP

Prieska Power Reserve WEF

Environmental Sensitivity Map

Legend

- Cliff buffer
- Internal roads
- New Position B19
- Transmission line - 132 kV
- VE 1km exclusion zone
- Verreaux's Eagle Nest



Google Earth

Image © 2022 Maxar Technologies

Environmental Sensitivity Map

APPENDIX E: SPECIALIST REPORTS

1. Ecological (Terrestrial, Surface Water drainage);
2. Avifauna;
3. Heritage, Archaeology and Palaeontology;
4. Socio-Economic; and
5. Visual

APPENDIX F: PUBLIC PARTICIPATION

Scoping phase public participation

1. Two perimeter site notices placed on 09 September 2022;
2. Advert placed in the local newspaper the Gemsbok on 15 September 2022;
3. Hard copy of the draft scoping report placed at the Public Library, and one placed at the Siyathemba Local Municipal offices on 09 September 2022;
4. Digital copy of the draft scoping report emailed to identified Stakeholders; and
5. Placement of the Draft Scoping Report on www.green-box.co.za
6. Request for comments on the Draft Scoping report from the 15th of September to the 16th of October 2022.
7. Final Scoping report accepted on 21 November 2022.

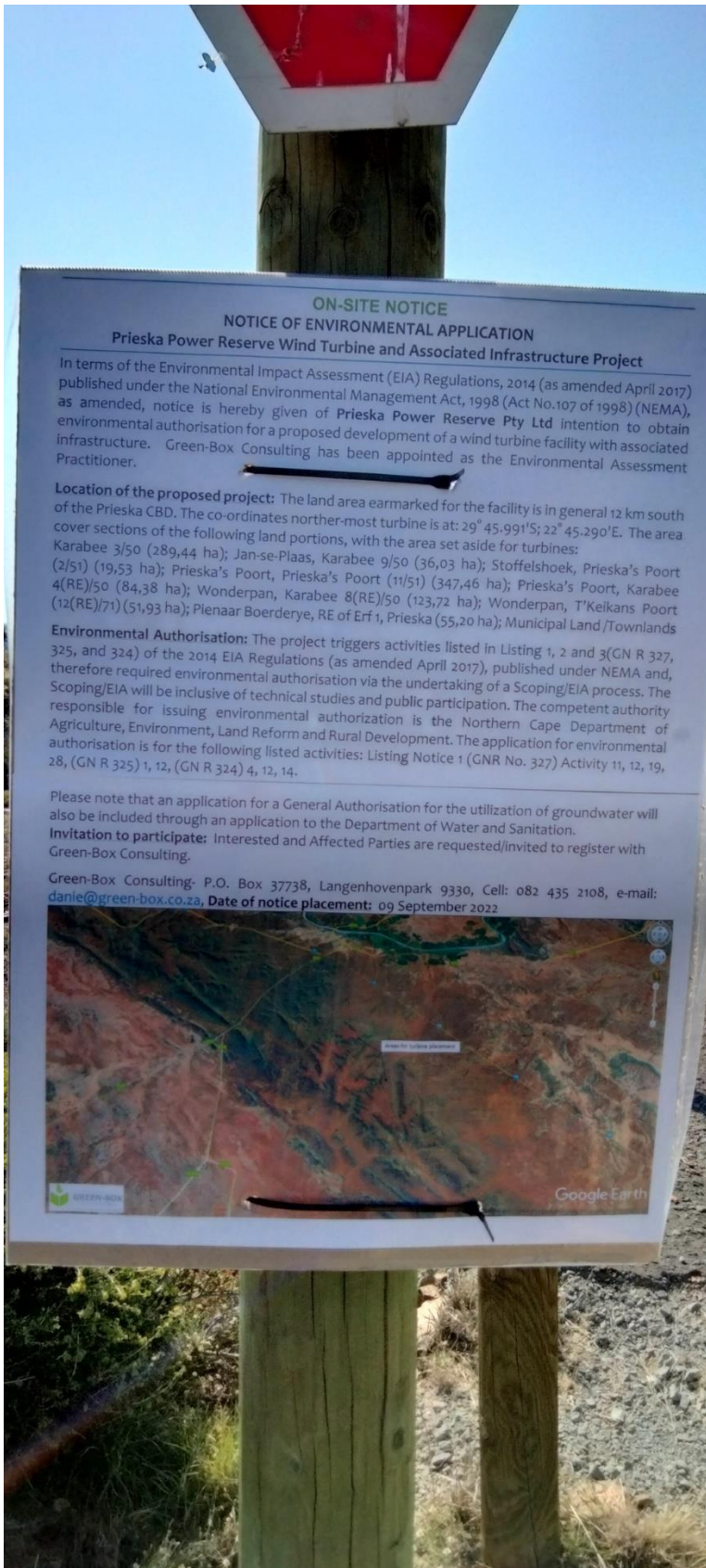
Environmental Impact Assessment phase public participation

1. Request for comments on the Draft EA report from the 22nd of November to the 14th of December 2022 and again from the 06th of to the 12th of January 2023 (30 day period)

Notices, onsite and public advert



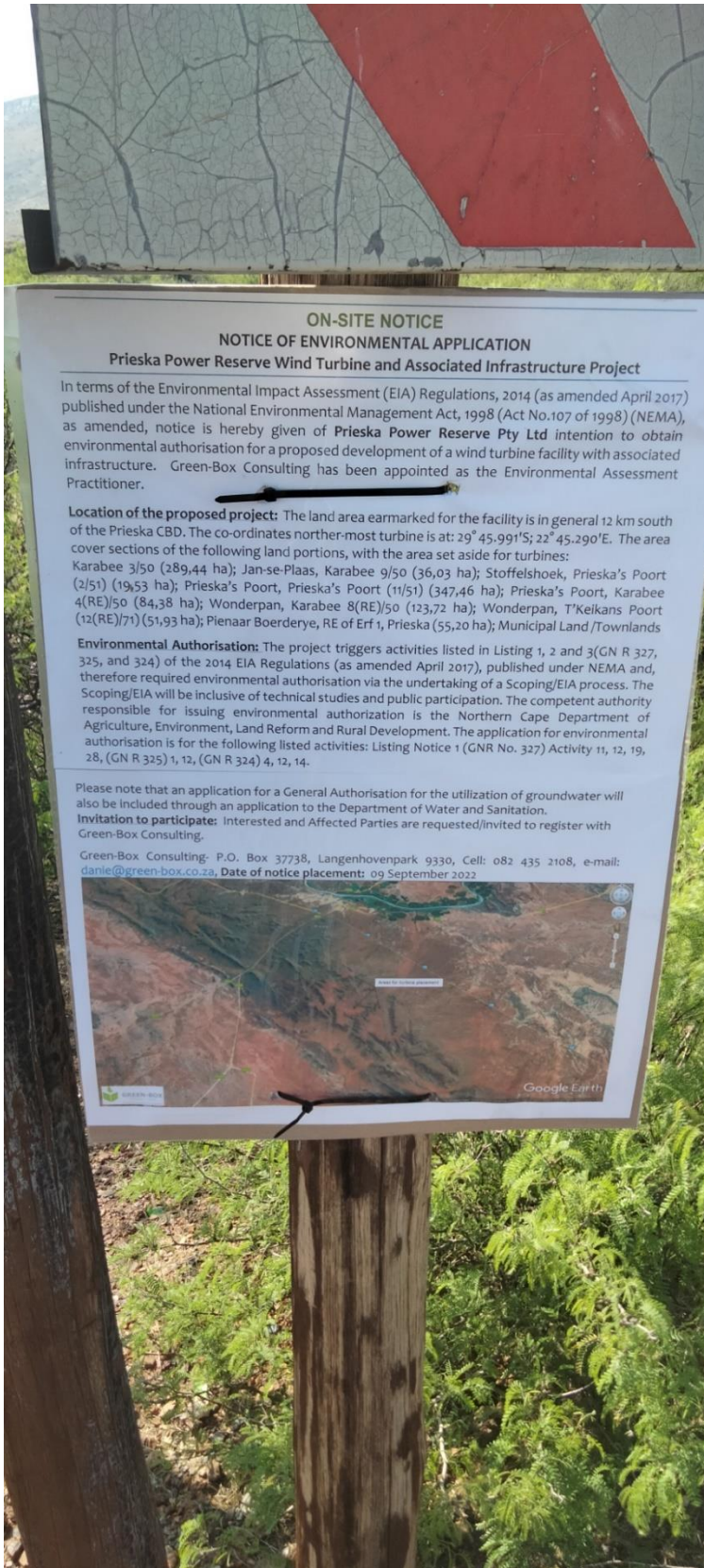
Onsite notice 1: Placed Along the N10, 29° 44' 08.27"S, 22° 47' 35.34"E



Onsite notice 1: Placed Along the N10, 29° 44' 08.27"S, 22° 47' 35.34"E



Onsite notice 2: Placed at the entrance point (access road to the wind turbine site), road R357
 $29^{\circ} 45' 57.69''\text{S}$, $22^{\circ} 41' 11.28''\text{E}$



Onsite notice 2: Placed at the entrance point (access road to the wind turbine site), road R357
 29° 45' 57.69"S, 22° 41' 11.28"E



Copy of the draft scoping report placed at the municipal offices



Copy of the draft scoping report placed at the Municipal Library

SPAR WOMEN'S CHALLENGE 2022

NOTICE BY THE MEMBER OF EXECUTIVE COUNCIL FOR DEPARTMENT OF ROADS AND PUBLIC WORKS NORTHERN CAPE PROVINCE

IN TERMS OF SECTION 3(B) OF THE NORTHERN CAPE LAND ADMINISTRATION ACT NO 62002 read with GOVERNMENT IMMOVABLE ASSET MANAGEMENT ACT NO 19/2007

1. The Member of the Executive Council for the Department of Roads and Public Works, as the assigned Custodian of all provincially owned immovable assets, hereby wish to publish its intention to dispose of the undermentioned immovable asset.

Property Description: Oranjezicht High School Hostel
Address: Springbok Avenue
Erf number: A portion of Erf 1122
Town: Swartkops
District: 27 Mqandeni
Title Deed description: T602014
Estate: 7 2502 ha
Proposed use: Office
Current use: School Hostel
Proposed Transfer: Kai Garb Municipality

2. Interested parties who believe they have reason or good cause to object to the aforementioned disposal, are called upon to make written representations within 21 days from the date of publication of this notice to the Head of Department, Department of Roads and Public Works, who shall review the representations and make recommendations to the assigned custodian of immovable assets being the MEC responsible for Roads and Public Works. This is in terms of section 3 (f) of the Northern Cape Land Administration Act, 2002 (Act No. 6 of 2002)

3. For further information regarding the aforementioned disposal, interested parties may contact the office of the Chief Director, Department of Roads and Public Works

Chief Director: Ms. O.J. Gill
Tel: 053 - 859 2241
Physical Address: 9 - 11 Stolobos Street, Square Hill Park, Kimberley
Postal Address: P O Box 3132, Kimberley, 8300



Die team vir 2022 Spar Women's Virtual Challenge was 'n span.

Hiermee is elke deelnemer uitgedaag om, onderhous sy geslag, agtergrond, ras, of omstandighede, uit te styg bo sy omstandighede om elke hindernis op sy pad te oorkom. Oorwiel: Vind jou vierkante, en leer vlieg op jou eie tyd en teen jou eie pas. Vanjaar was die oogmerk bemoediging van geslagsgeweld in samewerking met die Spar Petisieskema. Insameling van geld vir die projek, borg die beskerming van natuurlike produkte sodat mense gedurende linné monsterroute sal hulle steeds skool kan bywoon. Hierdie projek, ondersteun deur werksaamheidsorganisasies op nasionale vlak, betrek skole in al nege provinsies en Namibië. Gekloof in uitdagende blou Spar Virtual Challenge het die deelnemers maklik samewerking, om te verduidelik, geslag en geslags hoe linné bo hulle omstandighede kan uitstyg.



Vir Sally Friedberg, Micoa Brakes en Dineira Strauss posier die Spar Women's Virtual Challenge.

Foto: deur Ronald Rief Photography

NOTICE BY THE MEMBER OF THE EXECUTIVE OF ROADS AND PUBLIC WORKS NORTHERN CAPE PROVINCE

IN TERMS OF SECTION 3(B) OF THE NORTHERN CAPE LAND ADMINISTRATION ACT NO 62002 read with GOVERNMENT IMMOVABLE ASSET MANAGEMENT ACT NO 19/2007

1. The Member of the Executive Council for the Department of Roads and Public Works, as the assigned of all provincially owned immovable assets, hereby wish to publish its intention for the exchange of the undermentioned immovable assets.

Property Description: Nabaria Hostel
Address: Church Street
Erf number: 1348
Town: Collymore
District: Mankweng
Title Deed description: T24740018
Estate: 1, 5801 ha
Proposed use: Office Accommodation
Current use: Hostel
Proposed Transfer: National Department of Public Works and Infrastructure

2. Interested parties who believe they have reason or good cause to object to the aforementioned disposal, are called upon to make written representations within 21 days from the date of publication of this notice to the Head of Department, Department of Roads and Public Works, who shall review the representations and make recommendations to the MEC in terms of section 3 (f) of the Northern Cape Land Administration Act, 2002 (Act No. 6 of 2002)

3. For further information regarding the aforementioned disposal, interested parties may contact the office of the Chief Director, Department of Roads and Public Works

Chief Director: Ms. O.J. Gill
Tel: 053 - 859 2241
Physical Address: 9 - 11 Stolobos Street, Square Hill Park, Kimberley
Postal Address: P O Box 3132, Kimberley, 8300

NOTICE BY THE MEMBER OF THE EXECUTIVE OF ROADS AND PUBLIC WORKS NORTHERN CAPE PROVINCE

IN TERMS OF SECTION 3(B) OF THE NORTHERN CAPE LAND ADMINISTRATION ACT NO 62002 read with GOVERNMENT IMMOVABLE ASSET MANAGEMENT ACT NO 19/2007

1. The Member of the Executive Council for the Department of Roads and Public Works, as the assigned of all provincially owned immovable assets, hereby wish to publish its intention for the exchange of the undermentioned immovable asset.

Property Description: M.E. Soyeman Hostel
Address: Albert Street
Erf number: 789 & 800
Town: Ceresburg
District: Pletty Va Some
Title Deed description: T12111958
Estate: 0,2272 (Combined ha)
Proposed use: Office Accommodation
Current use: Student Accommodation
Proposed Transfer: National Public Works & Infrastructure

2. Interested parties who believe they have reason or good cause to object to the aforementioned disposal, are called upon to make written representations within 21 days from the date of publication of this notice to the Head of Department, Department of Roads and Public Works, who shall review the representations and make recommendations to the MEC in terms of section 3 (f) of the Northern Cape Land Administration Act, 2002 (Act No. 6 of 2002)

3. For further information regarding the aforementioned disposal, interested parties may contact the office of the Chief Director, Department of Roads and Public Works

Chief Director: Ms. O.J. Gill
Tel: 053 - 859 2241
Physical Address: 9 - 11 Stolobos Street, Square Hill Park, Kimberley
Postal Address: P O Box 3132, Kimberley, 8300



Vir Monique Schreiner, Ellenor Pieters en Rita Schreiner #Rise

NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

Proposed development of the Prieska Power Reserve Phase 3, Wind Turbines & Associated Infrastructure, Prieska, NC

In terms of the Environmental Impact Assessment (EIA) Regulations, 2014 (as amended April 2017) published under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), as amended, notice is hereby given of Prieska Power Reserve (PPR) Ltd intention to obtain environmental authorisation for a proposed wind energy generation facility and its associated infrastructure, near Prieska.

Location of the proposed project: The project area is located about 10 km south-east of Prieska. The project area comprises of portions of the following farm portions:

- Karoo 350 (209,44 ha), Jan-va-Paas
- Karoo 480 (36,03 ha), Goo-Hoek
- Prieska's Poot (251) (19,53 ha)/Prieska's Poot
- Prieska's Poot (1181) (247,46 ha), Prieska's Poot
- Karoo 490/500 (94,30 ha), Wonderpark
- Karoo 500/500 (123,72 ha), Wonderpark
- T'Klaars Poot (12/80/71) (51,80 ha), Prieska Bontdarye
- RE of Erf 1, Prieska (95,20 ha), Municipal Land Bourdarye

Environmental Authorisation: The project triggers activities listed in Listing 1 (GN R 327) and Listing 2 (GN R 328) of the 2014 EIA Regulations (as amended April 2017), published under NEMA and, therefore require environmental authorisation via the undertaking of a Scoping/EIA process. The Scoping/EIA assessment will be inclusive of technical studies and public participation. The competent authority responsible for issuing environmental authorisation is the Northern Cape Department of Agriculture, Environment, Rural Development and Land Reform. The application for environmental authorisation is for the following listed activities: Listing Notice 1 (GNR No. 327) Activities no. 1(i), 12(i)(c), 24(i), 26(i) and 27. Listing Notice 2 (GN R 328) Activity no. 1.

Please note that comments will be sought from the South African Heritage Resources Agency (SAHRA) in terms of the National Heritage Resources Act, Act 25 of 1999.

Green-Box Consulting has been appointed as the Environmental Assessment Practitioner (EAP) to undertake and manage the Scoping/EIA process for the proposed Prieska Power Reserve Phase 3 Project on behalf of the applicant. Interested and/or Affected Parties (I&APs) are hereby notified of the release of the Draft Scoping Report for the proposed project for a 30-day commenting period, starting from the date of this advert placement. The draft Scoping Report can be downloaded from the following website: www.green-box.co.za

Should you be interested in registering as an I&AP and to provide comments on the Draft Scoping Report, you are kindly requested to send your name, contact details, with an indication of interest in the application, along with any comments, to the EAP at:

Danie Krugers, Green-Box Consulting, P.O. Box 27738, Langenhovenpark 8300, Cell: 062 468 2108, or e-mail: danie@green-box.co.za

NOTICE BY THE MEMBER OF EXECUTIVE OF ROADS AND PUBLIC WORKS NORTHERN CAPE PROVINCE

IN TERMS OF SECTION 3(B) OF THE NORTHERN CAPE LAND ADMINISTRATION ACT NO 62002 read with GOVERNMENT IMMOVABLE ASSET MANAGEMENT ACT NO 19/2007

1. The Member of the Executive Council for the Department of Roads and Public Works, as the assigned of all provincially owned immovable assets, hereby wish to publish its intention for the exchange of the undermentioned immovable asset.

Property Description: State Owned Residence
Address: 17 Wessendon Street
Erf number: 2360
Town: Lingskop
District: 27 Mqandeni District
Title Deed description: T3697970
Estate: 6,1129 ha
Proposed use: Office Accommodation
Current use: Family Advocate Court
Proposed Transfer: Department of National Public Works and Infrastructure

2. Interested parties who believe they have reason or good cause to object to the aforementioned disposal, are called upon to make written representations within 21 days from the date of publication of this notice to the Head of Department, Department of Roads and Public Works, who shall review the representations and make recommendations to the MEC in terms of section 3 (f) of the Northern Cape Land Administration Act, 2002 (Act No. 6 of 2002)

3. For further information regarding the aforementioned disposal, interested parties may contact the office of the Chief Director, Department of Roads and Public Works

Chief Director: Ms. O.J. Gill
Tel: 053 - 859 2241
Physical Address: 9 - 11 Stolobos Street, Square Hill Park, Kimberley
Postal Address: P O Box 3132, Kimberley, 8300



Charme Kruger, ons sie moerme uit die Boesmanland, is hier by Letitia van der Coiff - wind-velstander van SPAR Brays / SaveMör Kelmoo

Advert placed in the Gembok newspaper of 15 September 2022

NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

Proposed development of the Prieska Power Reserve Phase 3, Wind Turbines & Associated Infrastructure, Prieska, NC

In terms of the Environmental Impact Assessment (EIA) Regulations, 2014 (as amended April 2017) published under the National Environmental Management Act, 1998 (Act No.107 of 1998) (NEMA), as amended, notice is hereby given of Prieska Power Reserve (Pty) Ltd intention to obtain environmental authorisation for a proposed wind energy generation facility and its associated infrastructure, near Prieska.

Location of the proposed project: The project area is located about 10 km south-east of Prieska. The project site comprises of portions of the following farm portions:

- Karabee 3/50 (289,44 ha); Jan-se-Plaas
- Karabee 9/50 (36,03 ha); Stoffelshoek
- Prieska's Poort (2/51) (19,53 ha); Prieska's Poort
- Prieska's Poort (11/51) (347,46 ha); Prieska's Poort
- Karabee 4(RE)/50 (84,38 ha); Wonderpan
- Karabee 8(RE)/50 (123,72 ha); Wonderpan
- T'Keikans Poort (12(RE)/71) (51,93 ha); Pienaar Boerderye
- RE of Erf 1, Prieska (55,20 ha); Municipal Land /Townlands

Environmental Authorisation: The project triggers activities listed in Listings 1 (GN R 327) and Listing 2 (GN R 325) of the 2014 EIA Regulations (as amended April 2017), published under NEMA and, therefore requires environmental authorisation via the undertaking of a Scoping/EIA process. The Scoping/EIA assessment will be inclusive of technical studies and public participation. The competent authority responsible for issuing environmental authorization is the Northern Cape Department of Agriculture, Environment, Rural Development and Land Reform. The application for environmental authorisation is for the following listed activities: Listing Notice 1 (GNR No. 327) Activities no. 11(i), 12(ii)(c), 24(ii), 28(ii) and 27. Listing Notice 2 (GN R 325) Activity no. 1.

Please note that comments will be sought from the South African Heritage Resources Agency (SAHRA) in terms of the National Heritage Resources Act, Act 25 of 1999.

Green-Box Consulting has been appointed as the Environmental Assessment Practitioner (EAP) to undertake and manage the Scoping/EIA process for the proposed Prieska Power Reserve Phase 3 Project on behalf of the applicant. Interested and /or Affected Parties (I&APs) are hereby notified of the release of the Draft Scoping Report for the proposed project for a 30-day commenting period, starting from the date of this advert placement. The draft Scoping Report can be downloaded from the following website: www.green-box.co.za

Should you be interested in registering as an I&AP and to provide comments on the Draft Scoping Report, you are kindly requested to send your name, contact details, with an indication of interest in the application, along with any comments, to the EAP at:

Danie Krynauw, Green-Box Consulting- P.O. Box 37738,
Langenhovenpark 9330,
Cell: 082 435 2108, or e-mail: danie@green-box.co.za

Advert placed in the Gemsbok newspaper of 15 September 2022

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 ; dekokcr@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
Marc	Caplan	remsmc@gmail.com	Private individual
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

Request for comments on the Draft Scoping Report

Draft Scoping Report for comments - Prieska Power reserve Wind Turbine Project, Prieska



Danie Krynauw <danie@green-box.co.za>
To 'obstacles@caa.co.za'; 'pretoriusk@caa.co.za'; 'mail@caa.co.za'



Reply

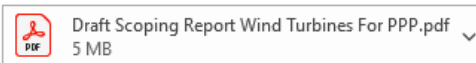
Reply All

Forward



Thu 15 Sep 2022 21:15

You forwarded this message on 15 Sep 2022 21:29.



Dear Stakeholder

Your Department has been identified as a Stakeholder in the Environmental Impact Assessment application submitted for the proposed development of a wind turbine facility, near Prieska.

Attached a PDF copy of the draft Scoping Report, for your review and comments in accordance with the EIA Regulations, 2014 (as amended).

Should you and / or your organisation wish to comment on the Draft Scoping Report for the proposed project, such comments should be sent to our Mr. Danie Krynauw (at the details below) by no later than 17 October 2022.

For more information, please refer to the attached letter.

Should you have any queries on the above, or require any further information, please do not hesitate to contact the undersigned.

Yours sincerely

Danie Krynauw
Reg. EAP (EAPASA)



C 082 435 2108
E danie@green-box.co.za
W www.green-box.co.za

51 Willie du Plessis
Fichardtspark
Bloemfontein

INTEGRATED ENVIRONMENTAL MANAGEMENT



Draft Scoping Report for comments - Prieska Power reserve Wind Turbine Project, Prieska



Danie Krynauw <danie@green-box.co.za>
To 'Elsabe Swart'

Reply Reply All Forward

Thu 15 Sep 2022 21:16

Draft Scoping Report Wind Turbines For PPP.pdf 5 MB DAELR Biodiversity.pdf 148 KB

Dear Stakeholder

Your Department has been identified as a Stakeholder in the Environmental Impact Assessment application submitted for the proposed development of a wind turbine facility, near Prieska.

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Should you have any queries on the above, or require any further information, please do not hesitate to contact the undersigned.

Yours sincerely

Danie Krynauw
Reg. EAP (EAPASA)



C 082 435 2108 51 Willie du Plessis
E danie@green-box.co.za Fichardtspark
W www.green-box.co.za Bloemfontein

INTEGRATED ENVIRONMENTAL MANAGEMENT



Draft Scoping Report for comments - Prieska Power reserve Wind Turbine Project, Prieska



Danie Krynauw <danie@green-box.co.za>
To 'mashudum@daff.gov.za'



Reply

Reply All

Forward



Thu 15 Sep 2022 21:17



Draft Scoping Report Wind Turbines For PPP.pdf
5 MB



DAFF.pdf
148 KB

Dear Stakeholder

Your Department has been identified as a Stakeholder in the Environmental Impact Assessment application submitted for the proposed development of a wind turbine facility, near Prieska.

Attached a PDF copy of the draft Scoping Report, for your review and comments in accordance with the EIA Regulations, 2014 (as amended).

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For more information, please refer to the attached letter.

Should you have any queries on the above, or require any further information, please do not hesitate to contact the undersigned.

Yours sincerely

Danie Krynauw
Reg. EAP (EAPASA)



C 082 435 2108
E danie@green-box.co.za
W www.green-box.co.za

51 Willie du Plessis
Fichardtspark
Bloemfontein

INTEGRATED ENVIRONMENTAL MANAGEMENT



FW: Draft Scoping Report for comments - Prieska Power reserve Wind Turbine Project, Prieska



Danie Krynauw <danie@green-box.co.za>
To 'Jacoline Mans'

Reply Reply All Forward

Thu 15 Sep 2022 21:18

- Draft Scoping Report Wind Turbines For PPP.pdf 5 MB
- DFFE J Mans.pdf 148 KB

Dear Stakeholder

Your Department has been identified as a Stakeholder in the Environmental Impact Assessment application submitted for the proposed development of a wind turbine facility, near Prieska.

Attached a PDF copy of the draft Scoping Report, for your review and comments in accordance with the EIA Regulations, 2014 (as amended).

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Should you have any queries on the above, or require any further information, please do not hesitate to contact the undersigned.

Yours sincerely

Danie Krynauw
Reg. EAP (EAPASA)



C 082 435 2108 51 Willie du Plessis
E danie@green-box.co.za Fichardtspark
W www.green-box.co.za Bloemfontein

INTEGRATED ENVIRONMENTAL MANAGEMENT



Draft Scoping Report for comments - Prieska Power reserve Wind Turbine Project, Prieska



Danie Krynauw <danie@green-box.co.za>
To 'pixley@telkomsa.net'

Reply Reply All Forward

Thu 15 Sep 2022 21:20

Draft Scoping Report Wind Turbines For PPP.pdf 5 MB DM.pdf 148 KB

Dear Stakeholder

Your Department has been identified as a Stakeholder in the Environmental Impact Assessment application submitted for the proposed development of a wind turbine facility, near Prieska.

Attached a PDF copy of the draft Scoping Report, for your review and comments in accordance with the EIA Regulations, 2014 (as amended).

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Yours sincerely

Danie Krynauw
Reg. EAP (EAPASA)



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

INTEGRATED ENVIRONMENTAL MANAGEMENT



Draft Scoping Report for comments - Prieska Power reserve Wind Turbine Project, Prieska



Danie Krynauw <danie@green-box.co.za>
To 'rmatsoso@ncpg.gov.za'; 'eugene.nkatlholang@dmr.gov.za'



Reply

Reply All

Forward



Thu 15 Sep 2022 21:21



Draft Scoping Report Wind Turbines For PPP.pdf
5 MB



DMR.pdf
149 KB

Dear Stakeholder

Your Department has been identified as a Stakeholder in the Environmental Impact Assessment application submitted for the proposed development of a wind turbine facility, near Prieska.

Attached a PDF copy of the draft Scoping Report, for your review and comments in accordance with the EIA Regulations, 2014 (as amended).

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For more information, please refer to the attached letter.

Should you have any queries on the above, or require any further information, please do not hesitate to contact the undersigned.

Yours sincerely

Danie Krynauw
Reg. EAP (EAPASA)



C 082 435 2108
E danie@green-box.co.za
W www.green-box.co.za

51 Willie du Plessis
Fichardtspark
Bloemfontein

INTEGRATED ENVIRONMENTAL MANAGEMENT



Draft Scoping Report for comments - Prieska Power reserve Wind Turbine Project, Prieska



Danie Krynauw <danie@green-box.co.za>
To 'vandyk@dws.gov.za'; 'Van Dyk Gawie (KBY)'

Reply Reply All Forward

Thu 15 Sep 2022 21:22



Draft Scoping Report Wind Turbines For PPP.pdf
5 MB



DWS.pdf
148 KB

Dear Stakeholder

Your Department has been identified as a Stakeholder in the Environmental Impact Assessment application submitted for the proposed development of a wind turbine facility, near Prieska.

Attached a PDF copy of the draft Scoping Report, for your review and comments in accordance with the EIA Regulations, 2014 (as amended).

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For more information, please refer to the attached letter.

Should you have any queries on the above, or require any further information, please do not hesitate to contact the undersigned.

Yours sincerely

Danie Krynauw
Reg. EAP (EAPASA)



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

INTEGRATED ENVIRONMENTAL MANAGEMENT



Draft Scoping Report for comments - Prieska Power reserve Wind Turbine Project, Prieska



Danie Krynauw <danie@green-box.co.za>
To 'info@energy.gov.za'



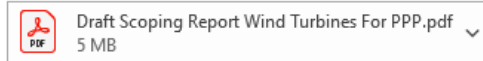
Reply

Reply All

Forward



Thu 15 Sep 2022 21:22



Dear Stakeholder

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Attached a PDF copy of the draft Scoping Report, for your review and comments in accordance with the EIA Regulations, 2014 (as amended).

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Yours sincerely

Danie Krynauw
Reg. EAP (EAPASA)



C 082 435 2108
E danie@green-box.co.za
W www.green-box.co.za

51 Willie du Plessis
Fichardtpark
Bloemfontein

INTEGRATED ENVIRONMENTAL MANAGEMENT



Draft Scoping Report for comments - Prieska Power reserve Wind Turbine Project, Prieska



Danie Krynauw <danie@green-box.co.za>
To 'csonline@eskom.co.za'; 'johan.geeringh@eskom.co.za'



Reply

Reply All

Forward



Thu 15 Sep 2022 21:23



Draft Scoping Report Wind Turbines For PPP.pdf
5 MB



ESKOM.pdf
149 KB

Dear Stakeholder

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Attached a PDF copy of the draft Scoping Report, for your review and comments in accordance with the EIA Regulations, 2014 (as amended).

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Yours sincerely

Danie Krynauw
Reg. EAP (EAPASA)



C 082 435 2108
E danie@green-box.co.za
W www.green-box.co.za

51 Willie du Plessis
Fichardtspark
Bloemfontein

INTEGRATED ENVIRONMENTAL MANAGEMENT



Draft Scoping Report for comments - Prieska Power reserve Wind Turbine Project, Prieska



Danie Krynauw <danie@green-box.co.za>
To 'mm@siyathemba.gov.za'



Reply

Reply All

Forward



Thu 15 Sep 2022 21:23



Draft Scoping Report Wind Turbines For PPP.pdf
5 MB



LM.pdf
148 KB

Dear Stakeholder

Your Department has been identified as a Stakeholder in the Environmental Impact Assessment application submitted for the proposed development of a wind turbine facility, near Prieska.

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Yours sincerely

Danie Krynauw
Reg. EAP (EAPASA)



C 082 435 2108
E danie@green-box.co.za
W www.green-box.co.za

51 Willie du Plessis
Fichardtspark
Bloemfontein

INTEGRATED ENVIRONMENTAL MANAGEMENT



Draft Scoping Report for comments - Prieska Power reserve Wind Turbine Project, Prieska



Danie Krynauw <danie@green-box.co.za>

To 'ratha.timothy@gmail.com'; 'rtimathy@nbkb.org.za'



Reply

Reply All

Forward



Thu 15 Sep 2022 21:24



Draft Scoping Report Wind Turbines For PPP.pdf
5 MB



NC Heritage.pdf
149 KB

Dear Stakeholder

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Attached a PDF copy of the draft Scoping Report, for your review and comments in accordance with the EIA Regulations, 2014 (as amended).

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For more information, please refer to the attached letter.

Should you have any queries on the above, or require any further information, please do not hesitate to contact the undersigned.

Yours sincerely

Danie Krynauw
Reg. EAP (EAPASA)



C 082 435 2108
E danie@green-box.co.za
W www.green-box.co.za

51 Willie du Plessis
Fichardtspark
Bloemfontein

INTEGRATED ENVIRONMENTAL MANAGEMENT



Draft Scoping Report for comments - Prieska Power reserve Wind Turbine Project, Prieska



Danie Krynauw <danie@green-box.co.za>
To 'Elizabeth.taylor@nersa.org.za'; 'info@nersa.org.za'



Reply

Reply All

Forward



Thu 15 Sep 2022 21:25



Draft Scoping Report Wind Turbines For PPP.pdf
5 MB



NERSA.pdf
149 KB

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INTEGRATED ENVIRONMENTAL MANAGEMENT



Draft Scoping Report for comments - Prieska Power reserve Wind Turbine Project, Prieska



Danie Krynauw <danie@green-box.co.za>
To 'abrahamsn@nra.co.za'



Reply

Reply All

Forward



Thu 15 Sep 2022 21:26



Draft Scoping Report Wind Turbines For PPP.pdf
5 MB



NRA.pdf
148 KB

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INTEGRATED ENVIRONMENTAL MANAGEMENT



Draft Scoping Report for comments - Prieska Power reserve Wind Turbine Project, Prieska



Danie Krynauw <danie@green-box.co.za>
To 'mmanong@nc.sahra.org.za'; 'nhiggitt@sahra.org.za'

Reply Reply All Forward

Thu 15 Sep 2022 21:27

Draft Scoping Report Wind Turbines For PPP.pdf 5 MB SAHRA.pdf 151 KB

Dear Stakeholder

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C 082 435 2108 51 Willie du Plessis
E danie@green-box.co.za Fichardtspark
W www.green-box.co.za Bloemfontein

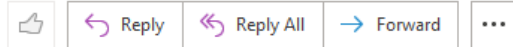
INTEGRATED ENVIRONMENTAL MANAGEMENT



Draft Scoping Report for comments - Prieska Power reserve Wind Turbine Project, Prieska



Danie Krynauw <danie@green-box.co.za>
To 'ithatelo@salga.org.za'



Thu 15 Sep 2022 21:27



Draft Scoping Report Wind Turbines For PPP.pdf
5 MB



SALGA.pdf
149 KB

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

INTEGRATED ENVIRONMENTAL MANAGEMENT



Draft Scoping Report for comments - Prieska Power reserve Wind Turbine Project, Prieska



Danie Krynauw <danie@green-box.co.za>

To 'runkelc@nra.co.za'; 'René de Kock (WR)'



Reply

Reply All

Forward



Thu 15 Sep 2022 21:27



Draft Scoping Report Wind Turbines For PPP.pdf
5 MB



SANRAL.pdf
155 KB

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Bloemfontein

INTEGRATED ENVIRONMENTAL MANAGEMENT



Draft Scoping Report for comments - Prieska Power reserve Wind Turbine Project, Prieska



Danie Krynauw <danie@green-box.co.za>
To 'koegelenbergj@sentech.co.za'

Reply Reply All Forward

Thu 15 Sep 2022 21:28

Draft Scoping Report Wind Turbines For PPP.pdf 5 MB SENTECH.pdf 149 KB

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INTEGRATED ENVIRONMENTAL MANAGEMENT



Draft Scoping Report for comments - Prieska Power reserve Wind Turbine Project, Prieska



Danie Krynauw <danie@green-box.co.za>
To 'atiplady@ska.ac.za'



Reply

Reply All

Forward



Thu 15 Sep 2022 21:28



Draft Scoping Report Wind Turbines For PPP.pdf
5 MB



SKA.pdf
148 KB

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Fichardtpark
Bloemfontein

INTEGRATED ENVIRONMENTAL MANAGEMENT



Draft Scoping Report for comments - Prieska Power reserve Wind Turbine Project, Prieska

 Danie Krynauw <danie@green-box.co.za>
To: 'knogwili@ncpg.gov.za'; 'knogwil@ncpg.gov.za'; 'drpw-info@ncpg.gov.za'; 'ncorns@ncpg.gov.za' Thu 15 Sep 2022 21:29

  Reply  Reply All  Forward 

 Draft Scoping Report Wind Turbines For PPP.pdf 5 MB  Transport, Roads.pdf 150 KB

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INTEGRATED ENVIRONMENTAL MANAGEMENT



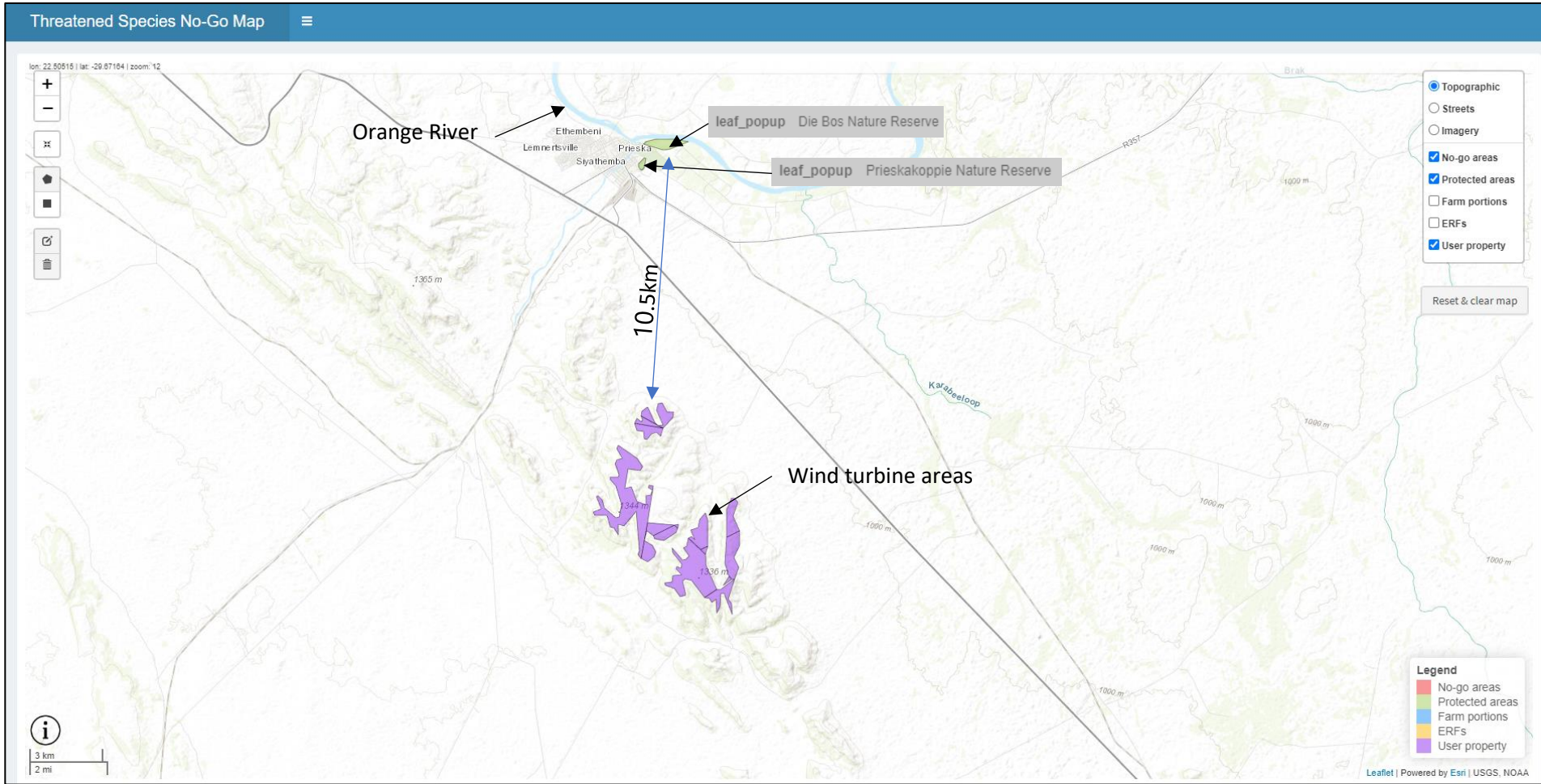
Comments and Response trail

First Name	Surname	Organisation	Comments	Response
Elsabe	Swart	Provincial Department of Agriculture, Environmental Affairs, Rural Development and Land Reform, Directorate, Biodiversity	None received	N/A
Gawie	Van Dyk	Department of Water and Sanitation	None received	N/A
Jacoline	Mans	Provincial DAFF	None received	N/A
Mashudu	Marubini	National Department of Agriculture, Forestry and Fisheries (DAFF)	None received	N/A
Elizabeth	Taylor	National Energy Regulator of South Africa	None received	N/A
IA Natasha	Bulane Corns	Department of Transport, Roads and Public Works	None received	N/A
Colene Rene	Runkel De Kock	South African National Roads Agency Limited – Northern Cape (Western Region)	None received	N/A
Shireen	Mohammed	Department of Social Development, NC	None received	N/A
Ratha	Timothy	Northern Cape Provincial Heritage Resources Authority	None received	N/A
Harry Koos	Roberts Pretorius	South African Civilian Aviation Authority	(16 September 2022) - Good day, kindly find the new procedure and process to follow, toward Wind farm as on the CAA website. http://www.caa.co.za/Pages/Default.aspx http://www.caa.co.za/Pages/Obstacles/Urgent-notices.aspx	Noted, Application as per the CAA procedure has been submitted.

First Name	Surname	Organisation	Comments	Response
			<p>Obstacle Notice 1/2022 – Appointment of New Windfarm and Solar Obstacle Application Service Provider.</p> <p>Kindly be advised, Air Traffic and Navigation Services (ATNS) has been appointed as the Obstacle application Service Provider for Windfarms on 1 May 2021. They will be also responsible for Solar Obstacle Applications from the 1st of February 2022. All new Solar applications must be lodged to obstacles@atns.co.za.</p> <p>Their responsibility would pertain to the assessments, maintenance, and all other related matters in respect to Windfarms and Solar assessments.</p>	
John	Geeringh	ESKOM	None received	N/A
Adrian	Tiplady	Department of Science and Technology SKA SA	None received	N/A
Mamello	Ratikane	Department of Energy Northern Cape	None received	N/A
M Natasha	Manong Higgitt	South African Heritage Resources Agency	None received	N/A
R. Vincent	Matsoso Mula	Department of Mineral Resources	None received	N/A
Itumeleng	Thatelo	SALGA, environmental manager	None received	N/A
Johan	Koegelenberg	SENTECH	None received	N/A
IWJ	Stadhouer	Siyathemba Local Municipality	None received	N/A
Rodney	Pieterse	Pixley Ka Seme District Municipality	None received	N/A
Marc	Caplan	Private individual	1. (26 September 2022) - what are the different veld livestock & game carrying capacities,	1. One of the aims of Prieska Power Reserve with developing a wind

First Name	Surname	Organisation	Comments	Response
			<p>following" wet, normal & dry" levels of precipitation for a year? Bv: the koppies have more browsing material and the plain more,.....</p> <p>2. If you did not observe troop(s) of chacma baboons during the scoping day, at the site. Can you find out how often the baboons pass by to reach the; Prieska koppie?. Die bos natuur reservaat?, Gariëp River? On whose koppies are they normally over-nighting on.</p> <p>3. Collins is quoted in the scoping text, yet there is nothing in the references that gives a title to that paper/ chapter of scientific knowledge. Can you send a link to Collins' research?</p> <p>4. Table 28 Avifaunal conservation statuses, what are the current movements of those rare birds through the region at 25 km radius of the site?</p>	<p>electricity generating system on the mounts south of Prieska towns is also to start rehabilitating the surrounding development area, especially the low-lying plains to increase the grazing value of the area. Bush encroachment by thorny Acacia species (Swarthak) is a typical problem within the district. These species have become densely populated as a result of poor grazing management. The persistence of these species reduces the grazing value of the veld. As such it is planned that the especially the Swarthak be harvested as a secondary fuel source to supply the Town of Prieska with waste to energy power supply.</p> <p>2. An Ecological Specialist study was conducted for the study area, all results will be presented during the EIR phase of the application. See map below, indication the application area in relation to the Bos Nature Reserve and the Prieska Koppie Nature Reserve, as well as the Orange River.</p> <p>3. Collins is quoted in his summary of the link between an ECO and CBA area in terms of Biodiversity Plans. A link to this document will be sent.</p> <p>4. An Avifauna specialist study has been commissioned for the application, this study is done over various seasonal</p>

First Name	Surname	Organisation	Comments	Response
			And what are the population numbers of all those rare species in 100km radius? Consider medium & small mammal movements as part of the faunal study.	surveys, results of this study will be presented in the EIR phase of the application.
Stakeholders (NGOs and Conservation Organisations)				
Simon	Gear	Birdlife South Africa	None received	N/A
Praneel	Ruplal	Independent Communications Authority of South Africa (ICASA)	None received	N/A
Landowner/Adjacent Landowners				
Petrus	Nel	Karabee 5/50	None received	N/A
Frans	Lotz	Prieska Poort 51	None received	N/A



Protected areas map (nogo.ewt.org.za)

APPENDIX G: EMPR

Draft EMPr

November 2022

Reference Number: NC/EIA/11/PIX/SIY/PR14/2022

PRIESKA POWER RESERVE WIND ENERGY FACILITY & ASSOCIATED INFRASTRUCTURE, NORTHERN CAPE: PHASE 3

Prepared for:

Prieska Power Reserve (Pty) Ltd

Prepared by:

Green-Box Consulting

P.O. Box 37738

Langenhovenpark

9330

Phone: 082 435 2108

Email: info@green-box.co.za

Lead Author:

Danie Krynauw (EAPASA – 2019/1348)

1. INTRODUCTION

1.1 INTRODUCTION AND BACKGROUND

This Environmental Management Programme (EMPr) has been prepared as part of the Environmental Impact Assessment (EIA) process being conducted for the proposed development of the PRRP, Phase 3 and associated infrastructure on various farm portion situated near, Prieska. This Environmental Management Programme (EMPr) has been compiled in accordance with the Integrated Environmental Management (IEM) philosophy, which aims to achieve a desirable balance between conservation and development. IEM is a key instrument of the National Environmental Management Act (No. 107 of 1998, as amended) (NEMA). This Act promotes the integration of environmental management to activities that may have a significant effect on the environment, while IEM prescribes a methodology for ensuring that environmental management principles are fully integrated into all stages of the development process. It advocates the use of several environmental management tools that are appropriate for the various levels of decision-making. One of these tools in an Environmental Management Programme (EMPr). This Environmental Management Programme (EMPr) outlines the mitigation measures to be implemented for the construction phase proposed.

1.2 PROJECT OVERVIEW

PRIESKA POWER RESERVE (PTY) LTD is proposing the establishment of a wind generating facility with its associated infrastructure approximately 10km south-east from Prieska Town, which is located within the Siyathemba Local Municipality in the Northern Cape (refer to Figure 1).

The wind turbine facility is proposed to accommodate several turbines and associated infrastructure such as service roads, and transmission lines. From a regional perspective, this area is considered favourable for the development of wind electricity generating facilities by virtue of the climatic conditions, orographic conditions, relief and the extent of the site and the availability of direct transmission connection to serve a hydrogen manufacturing plant in the industrial zone of Prieska town. The identified site is available for development, and has road access via the R357 provincial road, onto an existing gravel track running towards the mountain where the turbine site is located.

This wind turbine project forms phase 3 of the Prieska Power Reserve, hydrogen conversion and ammonia production Project. The production of hydrogen is reliant on renewable energy sources such as solar and wind for energy production. Priska Power Reserve is exploring both sources. The nature and extent of the proposed wind energy generating facility, as well as potential environmental impacts associated with the construction, operation and decommissioning phases are explored in more detail in this Draft EIA Report.

11.1 Summary of the proposed development

The Prieska Power Reserve Wind Turbines & Associated Infrastructure project is proposed to be established on various portions of land covering an approximate 33.64ha. (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 <50ha can be appropriately placed within the boundaries of the broader site (1007,69 ha) 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.

In the first phase of the wind turbine project, a total of only 21 turbines will be erected, delivering 138,6 MW AC. The second phase will bring the erection of the other 12 turbines and an additional 85,8 MW AC. The actual footprint of a single turbine is 120m x 80m (0,96ha), they will be spaced at least 400m from each other. The following associated infrastructure will be included:

- 🌱 33 Turbines;
- 🌱 132 kV transmission lines;
- 🌱 Security fencing;
- 🌱 Laydown area;
- 🌱 Roads;
- 🌱 Combiner Stations; and
- 🌱 Substation and water lines.

The aim of this wind turbine facility is to generate electricity during the night to feed into the hydrogen industrial complex, allowing electricity generation from renewable resources 24hours a day. This complex will produce green hydrogen and ammonia production to feed zero emission green industries.

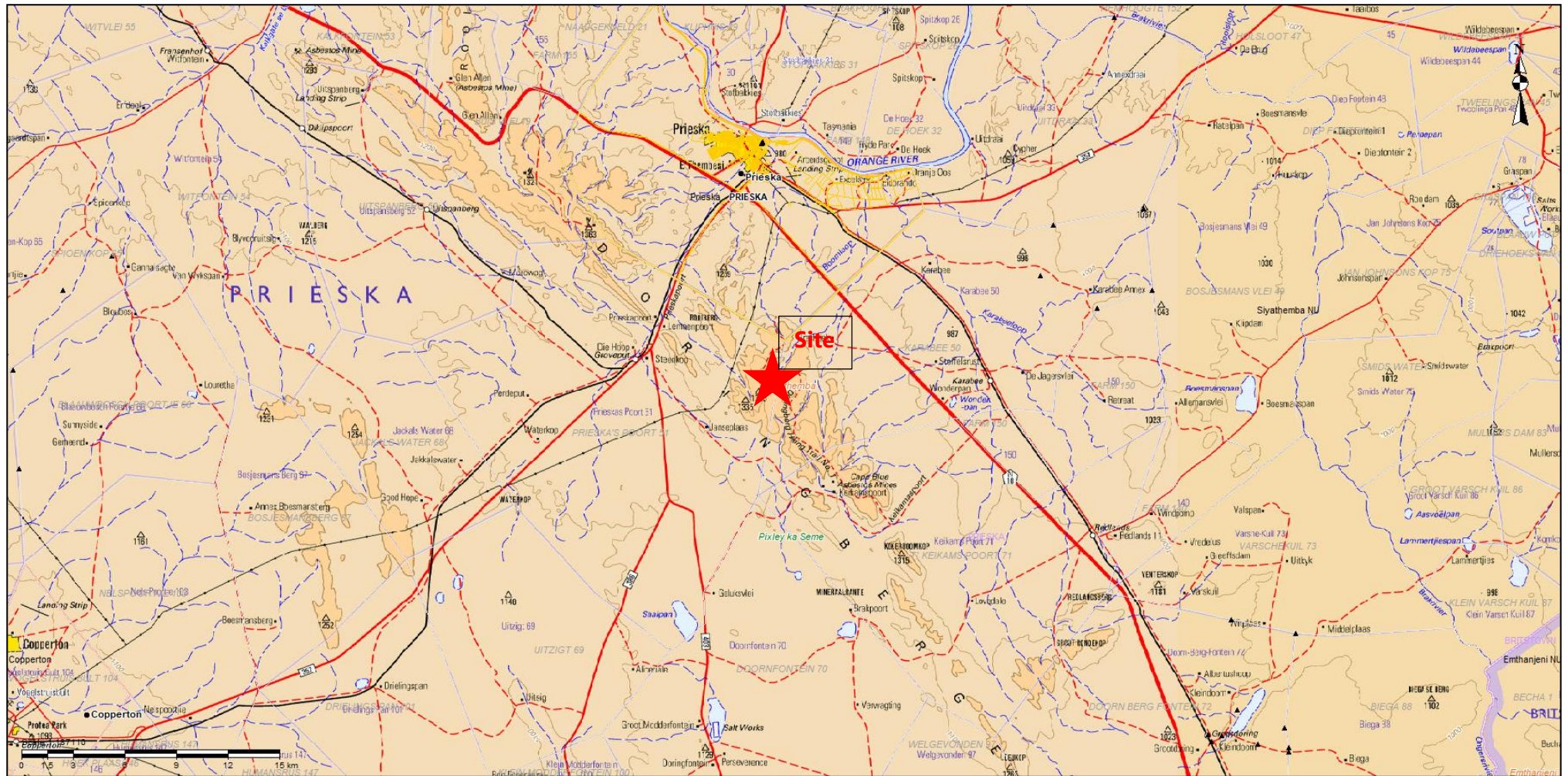


Figure 1: Location Map for the PRIESKA POWER RESERVE (PTY) LTD Wind Turbine Facility (Planet GIS, 2021)

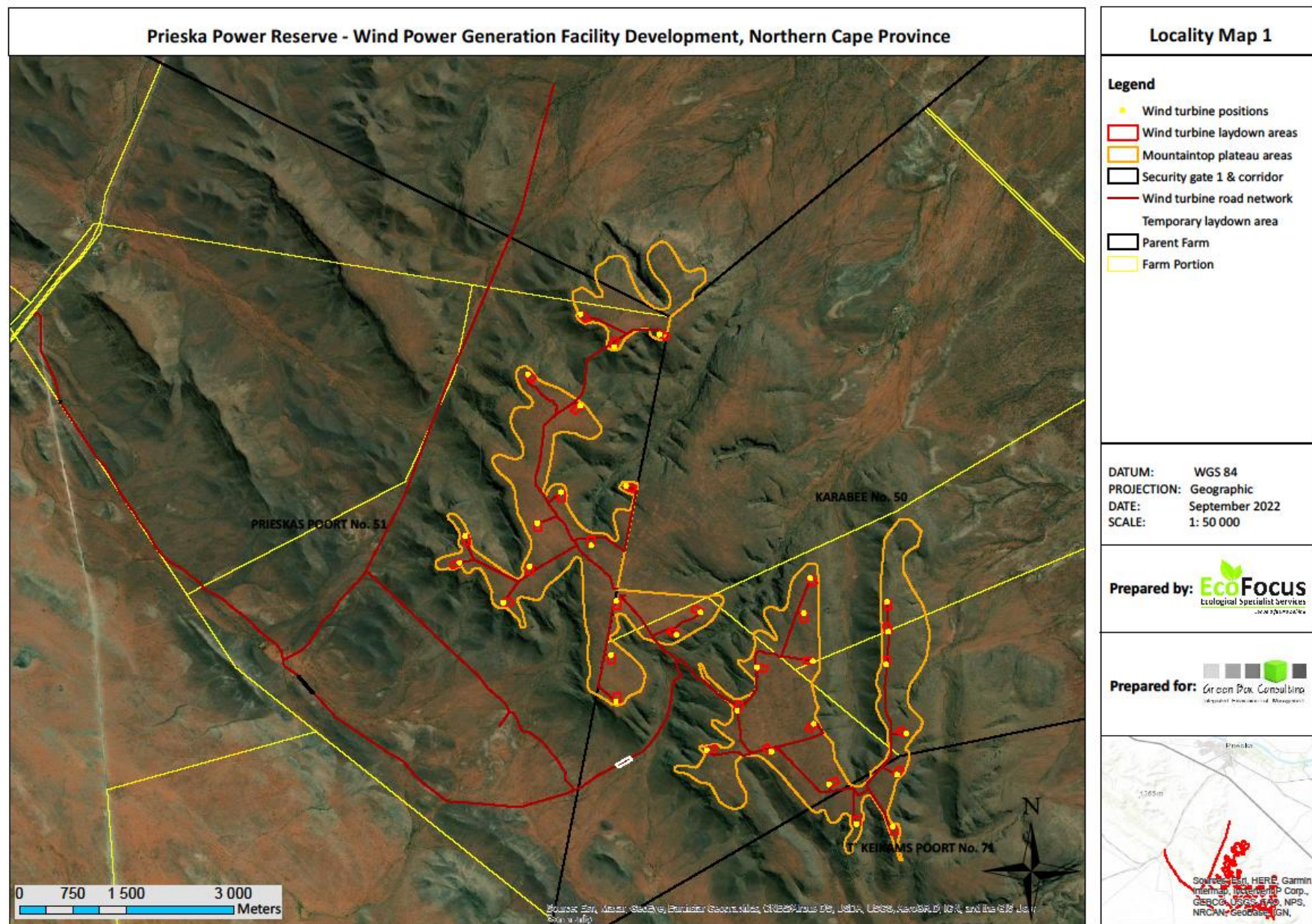


Figure 2: Aerial image for the PRIESKA POWER RESERVE (PTY) LTD Wind Turbine Facility (EcoFocus, 2021)

The overarching objective for the wind turbine facility is to maximise electricity production for the proposed ammonia and hydrogen manufacturing industry, one of the phases of the Prieska Power Reserve Project. Electricity production from the wind turbines will only be during night-time to allow the hydrogen manufacturing plant operational 24hours a day. This can be achieved through exposure to the wind 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 have been assessed through site-specific studies in order to delineate areas of sensitivity within the broader site, this informed the design of the facility.

A Curriculum Vitae detailing the EAPs relevant experience and expertise, is included.

1.3 AIM AND PURPOSE OF THE EMPr

The aim of this EMPr is to as far as possible minimise potential impacts that the development may have on the surrounding biophysical and socio-economic environment during the following development phases:

- Construction,
- Rehabilitation, and
- Operational.

The purpose of this EMPr is to:

- Encourage good management practices and commitment to environmental issues.
- Define how the management of the environment is reported and performance evaluated.
- Provide rational and practical environmental guidelines to:
 - Minimise disturbance of the natural environment,
 - Prevent or minimise all forms of pollution,
 - Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment, and
 - Adopt the best practicable means available to prevent or minimise adverse environmental impacts.
- Describe all monitoring procedures required to identify impacts on the environment.

In addition, the EMPr prepared for the project is intended to enable the project proponent, Prieska Power Reserve Pty Ltd and its contractors to meet their environmental obligations in accordance with NEMA. This EMPr provides systematic and explicit mitigation and monitoring measures for the proposed development of the PRRP and associated infrastructure near Prieska.

The EMPr sets environmental targets for the contractor and reasonable standards against which the contractor's performance can be measured during construction. The EMPr further enables authorities to check the practicability and likelihood of implementation of mitigation and monitoring measures.

Specific objectives of this EMPr are to:

- To provide explicit operational guidelines and environmental monitoring requirements during the construction phases so that activities are done in environmentally responsible and sustainable manner.
- To benefit the host communities, minimise the impacts on the environment and to ensure the health and safety of the community by creating a development that eliminates unacceptable health hazards and ensures public and animal safety.
- To enable Prieska Power Reserve Pty Ltd and its contractors to use resources efficiently and effectively during the project lifecycle in order to reduce wastage and thereby reduce associated negative environmental impacts. In addition, the aim is also to handle waste streams responsibly and apply the 'reduce, re-use and recycle' principle, wherever possible.
- To leave areas disturbed by construction in a rehabilitated, stable, non-polluting and tidy condition.

2 ACTIVITIES COVERED BY THE EMPr

2.1 PLANNING STAGE

The project planning stage consists of road designing, surveying and ensuring that all plans and required contracts, permits / licenses and agreements are in place.

2.2 CONSTRUCTION PHASE

The construction phase will commence following the issuing of Environmental Authorisation (EA) for the project, and once all other applicable approvals have been obtained. The construction phase will involve the removal of vegetation cover, transportation of personnel, construction material and equipment to the site, and personnel away from the site. In terms of site establishment, laydown areas will be required at the outset of the construction phase, as well as dedicated access routes from the laydown areas to the working areas. Haul roads for construction traffic (for the delivery of concrete, road materials and other construction materials) will also be required.

The laydown areas will be located at the project site. It is expected that the laydown areas will be temporary in nature (for the duration of the construction phase) and will include the establishment of construction site camps (including site offices and other temporary facilities for the appointed Contractors). The laydown areas are expected to cover a maximum area of 10000m² (depending on the contracting strategy at the time). If the laydown area is located outside of the footprint of the PPRP, the area will be rehabilitated (i.e. returned to its pre-construction condition) at the end of the construction phase.

All efforts will be made to ensure that all construction work will be undertaken in compliance with local, provincial and national legislation, local and international best practice, as well as this EMPr.

2.2.1 Rehabilitation phase

The aim of the rehabilitation phase is re-vegetate open areas and rehabilitate disturbed areas.

2.3 OPERATIONAL PHASE

During operation, the PPRP will provide world class infrastructure to support renewable energy generation. Electricity generated will feed into the proposed Hydrogen Industrial Plant of the PPRP. In order to sustainably operate the facility, constant maintenance and management of the site and project infrastructure will be required.

3 ROLES AND RESPONSIBILITIES

A number of potential environmental impacts, mitigatory measures and environmental management controls are laid out in this document. The effective implementation of this EMPr requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during the project life cycle. The key role players responsible for the successful implementation of the mitigation measures associated with the project include the Prieska Power Reserve Pty Ltd, the Contractor, the Designated Environmental Officer (DEO), and independent Environmental Control Officer (ECO).

3.1 DEPARTMENT OF AGRICULTURE, ENVIRONMENTAL AFFAIRS, RURAL DEVELOPMENT AND LAND REFORM (DAERL)

This Department is responsible for issuing EA and authorising the EMPr for the proposed project. DAERL also has overall responsibility for ensuring that the project proponent, Prieska Power Reserve Pty Ltd complies with the conditions contained within this EMPr.

3.2 PROJECT PROPONENT – PRIESKA POWER RESERVE PTY LTD

It is the responsibility of the project proponent, Prieska Power Reserve Pty Ltd, to ensure that this EMPr is fully implemented. The project proponent shall ensure that competent people are employed on the project by its construction contractor. Where necessary a skills development program will be instituted to ensure that the required levels of competency are attained. Prieska Power Reserve Pty Ltd should ensure that the selected contractor is able to adequately deal with the environmental challenges in this project.

3.3 CONTRACTOR

The Contractor refers to the team / company appointed by the project proponent to undertake the construction activities for the project. The Contractor shall have the following responsibilities:

- To implement all provisions of the EMPr. If the Contractor encounters difficulties with specifications, he / she must discuss alternative approaches with the Prieska Power Reserve Pty Ltd or ECO prior to proceeding.
- To ensure that all staff and sub-contractors are familiar with the EMPr and that duties and responsibilities of employees working on site include environmental responsibilities pertaining to the nature of their work.
- To make personnel aware of environmental issues and to ensure they show adequate consideration of the environmental aspects of the project.
- To report any incidents of non-compliance with the EMPr to the ECO and Prieska Power Reserve Pty Ltd's project managers.

3.3.1 THE DESIGNATED ENVIRONMENTAL OFFICER (DEO)

The contractor is required to appoint a competent individual on-site as a Designated Environmental Officer (DEO). The DEO must be appropriately trained in environmental management and must possess the skills necessary to impart environmental management to all personnel involved during the operational phase. The DEO will be responsible for overseeing the internal compliance with the EMPr requirements and ensuring that the environmental specifications are adhered to. The DEO must ensure that the required Method Statements are in place and appoint or designate personnel for environmental management issues. The DEO is responsible for training and for keeping detailed records of all site activities associated with the project that may pertain to the environment.

3.4 THE INDEPENDENT ENVIRONMENTAL CONTROL OFFICER (ECO)

In order to ensure compliance with this EMPr during construction an independent Environmental Control Officer (ECO) must be appointed Prieska Power Reserve Pty Ltd to monitor the implementation of the

recommendations made herein. The ECO must undertake monthly environmental control inspections and report compliance with the EMPr and Environmental Authorisation Conditions and report to Prieska Power Reserve Pty Ltd, the Contractor and DAERL if areas of non-conformance are identified. The ECO shall also advise Prieska Power Reserve Pty Ltd and its Contractor(s) on any identified opportunities for improving environmental performance.

In addition, 6 monthly full compliance audits must be undertaken by the ECO and audit report submitted to DAERL for their consideration. These compliance audits must be for both the construction and rehabilitation phases.

4 ENVIRONMENTAL MONITORING

Monitoring will be undertaken to ensure compliance with all aspects of the EMPr and Environmental Authorisation conditions. The day-to-day monitoring and verification that the EMPr and EA conditions are being adhered to shall be undertaken by the Contactor and DEO.

The Contractor shall establish an internal review procedure to monitor the progress and implementation of the EMPr. Where necessary, and upon the recommendation of the ECO, procedures that require modification shall be changed to improve the efficiency of the EMPr. Any slight changes or adjustments to the EMPr shall be discussed with the ECO and documented. Significant modifications to the EMPr will however need to be approved by DAERL before the changes or adjustments to the EMPr are implemented.

The ECO shall visit and audit the site once a month to ensure that correct operational procedures are being implemented and that the Contractor is complying with the environmental specifications in the EMPr. Additional site inspections by the ECO may be needed during the initial and final stages of the project. The ECO shall address any queries to the Contractor and Prieska Power Reserve Pty Ltd. If the queries cannot be resolved at this level, they shall be addressed to DAERL.

At the conclusion of the project an environmental performance report shall be compiled and submitted to DAERL. This report shall be compiled by the ECO, in collaboration with the Contractor and Prieska Power Reserve Pty Ltd and project managers. It shall, as a minimum, outline the implementation of the EMPr, and highlight any problems and issues that arose to report, on a formal basis, the lessons learned from the project.

5 NON-COMPLIANCE WITH THE EMPr

Any non-compliance with this EMPr will be treated as serious. Ultimate liability for non-compliance with the EMPr rests with the Project Proponent, Prieska Power Reserve Pty Ltd, and its Contractors. During the construction process work may be suspended by Prieska Power Reserve Pty Ltd in part, or in full if the Contractor fails to comply with the specifications set out within this EMPr. Such suspension of work shall be enforced until compliance is achieved.

6 RECORD OF ACTIVITIES

The Contractor shall keep a record of activities on site, including but not limited to the compliance with the EMPr. The records include but are not limited to:

- Environmental awareness and training records.
- Details of inspections and audits conducted, and corrective action taken.
- Details of complaints received from Interested and Affected Parties (I&APs) and responses provided.
- Records of environmental measurements and monitoring done that is mentioned in the EMPr.
- Internal and external meetings and reviews and any communication with authorities related to environmental management of the project.
- Environmental incidents and accidents and actions taken.
- Photographic records of progress on site from an environmental perspective.
- Environmental Incidents and Accidents records.

At the completion of the construction, reports confirming compliance with various points identified in the EMPr will be submitted to the project proponent.

7 COMPLAINTS REGISTER

All complaints received will be investigated and a response (even if pending further investigation) will be given to the complainant within seven working days. All environmental incidents occurring on site will be recorded. The following information for each incident will be recorded:

- Time, date, location and nature of the incident, and
- Actions taken and by whom.

Any complaints received from the community during the lifetime of the project will be registered and recorded by the Contractor and / or Project Manager on site. The following information will be recorded:

- Time, date and nature of the complaint,
- Response and investigation undertaken, and
- Actions taken and by whom.

8 REPORT AVAILABILITY

This EMPr must form part of the Terms of Reference (ToR) for all Sub-contractors, Suppliers, Staff and Visitors. Copies of this EMPr shall be kept at the construction site office and will be accessible to all senior contract personnel. All senior personnel working on the project shall be required to familiarise themselves with the contents of this EMPr.

9 ENVIRONMENTAL AWARENESS TRAINING

The Project Proponent has a responsibility to ensure that all those people involved in the project are aware of and are familiar with the contents of this EMPr. During the construction phase, the Contractor and his Sub-contractors must give assurance that they understand the EMPr and that they comply with the conditions therein. All senior and supervisory staff members must familiarise themselves with the full contents of this EMPr. They must know and understand specifications of the EMPr and be able to assist other staff members in matters relating to the EMPr. During the operational phase, the Project Proponent, Project Manager, and all senior and supervisory staff members, must understand and comply fully with the contents of this EMPr. In addition, all other site personnel must be educated in the contents of this document. Before commencing with any work, all staff members will be appropriately briefed about the EMPr and relevant occupational health and safety issues.

The successful implementation of the EMPr is hinged on adequate environmental awareness training of employees. The workforce needs to understand their role in the achievement of the objectives specified in this EMPr. All staff should be provided with environmental awareness training, while employees who require specialised training in line with the nature of their job should be provided with such, and records to this effect should be maintained

Environmental awareness training should include as a minimum the following:

- Making employees aware that everyone has a right to a clean environment and that everyone has a responsibility to protect the environment.
- Explanation of the importance of complying with the EMPr.
- Discussion of the potential environmental impacts of construction activities and mitigation measures that must be implemented when carrying out activities.
- Explanation of the management structure of individuals responsible for matters pertaining to the EMPr.
- Employees' roles and responsibilities, including emergency preparedness and response.
- Explanation of the specifics of the EMPr and its specification.
- It is recommended that a short induction lecture on environmental awareness be conducted for all Contractors and casual workers covering the following topics.
 - Importance of water conservation and conservation techniques
 - Waste management
 - Dust management
 - Artefacts
 - Noise
 - Fires
 - Storage of hazardous materials
 - Importance of good house keeping
 - Importance of minimising vegetation removal

The training should include showing areas within the construction site where no clearing of vegetation is to be done, as well as showing the personnel no-go areas, locations for stockpiles, and access roads to be used.

Training can either be done in a written or verbal format depending on whichever format is most appropriate for the receiving audience. Records of people who have undergone environmental awareness training must be maintained.

10.1 CONSTRUCTION PHASE

10.1.1 Social Environmental Issues

It is important to minimise the potential for negative perceptions, by taking proactive measures to prevent any social conflicts or social gaps, and to develop a positive attitude of the project within the community. The following management strategies are to be implemented in this regard:

- Transparent fair recruitment and procurement practices. The Contractor chosen should maximise the involvement of local communities in construction and support activities, to the extent possible, based on available skill levels. Whenever possible, training programmes that will benefit both construction stage skills requirements and long-term employment demand should be developed.
- The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.
- As far as possible, priority should be given to local suppliers of goods and services, which meet the requirements of project procurement. In order to optimise opportunities for local businesses to supply goods and services to the project, the Contractor will conduct a survey of goods and services that are available locally, and that are of an acceptable standard and quality, and a survey of the capabilities of local construction companies and identify opportunities for local suppliers.
- A public complaints register and system to ensure that community complaints are clearly investigated and adequate remedial taken should be instituted.
- Adequate notification should be done to people residing close to where construction activities are taking place especially if they are to be affected by them. In addition, there should be a system of compensation for any damages to infrastructure that may occur.
- Each worker should be required to abide by a Code of Conduct which will limit unsavoury activities in local towns and communities and restrict certain behaviours in the work sites and accommodation.

10.1.2 Establishing Office / Camp Sites

- The area chosen for these purposes shall be the minimum reasonably required and which will involve the least disturbance to vegetation. No trees or shrubs will be felled or damaged for the purpose of obtaining firewood, unless agreed to by the landowner.
- Fires will only be allowed in facilities or equipment specially constructed for this purpose. If required by applicable legislation, a fire-break shall be cleared around the perimeter of the camp and office sites.
- Lighting and noise disturbance or any other form of disturbance that may have an effect on surrounding landowners / tenants / persons lawfully residing within the vicinity shall be kept to a minimum.
- Chemical toilet facilities or other approved toilet facilities should be sited in such a way that they do not cause water or other pollution. The use of existing facilities must take place in consultation with the landowner / tenant.
- In cases where facilities are linked to existing sewerage structures, all necessary regulatory requirements concerning construction and maintenance should be adhered to. The facilities must comply with requirements of the National Water Act (No. 59 of 2008) (NWA).
- Adequate signage must be provided, and the area must be appropriated secured.
- Adequate parking and security should be provided at the campsites.

10.1.3 Air Quality

The main sources of impacts on air quality during the construction phase include the mobilisation of equipment, land clearing and earthworks. To ensure air quality characteristics of the project area are maintained near the baseline conditions during of the construction phase, the following measures shall be implemented:

- Regular inspection and scheduled maintenance of all equipment to ensure that construction vehicles are in good working condition, are utilising fuel efficiently, and do not result in the generation or release of smoke.
- Periodically watering the bare surfaces and excavations which have been cleared of vegetation during construction to minimise dust generation.
- Slowing down vehicles carrying construction materials to reduce dust generation along access roads.
- Properly wrapping the material truck containers with covers to avoid dust generation on windy days and prohibiting over loading of trucks.
- Providing and utilising safety equipment such as dust masks, and noise covers for employees who work near dusty locations such as the heavy equipment operators.
- Optimisation of working schedule and work activities to help to minimise vehicle mobilisation trips.

10.1.4 Noise and Vibrations

The primary sources of noise sources during construction will be vehicles and equipment utilised during the construction stage including graders, bulldozers, general purpose vehicles, etc. To manage the impact the following will be done:

- Working schedule for the activities with high noise level will be arranged between 08:00 AM to 17:00 PM.
- Only well-maintained vehicles and equipment should be operated onsite, and all machinery should be serviced regularly during the construction stage.
- Avoid unnecessarily undertaking noisy activities simultaneously.
- No amplified music shall be allowed at the site.
- Selecting “quiet” construction equipment and working method and avoiding unnecessary revving and hooting of vehicles.
- Providing ear protection for activities that are likely to create noise in order to protect worker’s health and safety.

10.1.5 Dust Generation and Emissions

- Implement suitable dust management and prevention measures during the construction phase.
- Construction roads and camps must be adequately wetted down on a continual basis.
- The water being used for wetting-down areas must be of sufficient quality in order to prevent significant contamination of the surrounding areas.
- Areas within and immediately surrounding the proposed development footprints must be adequately rehabilitated as soon as practicably possible after construction in order to prevent significant dust emissions.

10.1.6 Transformation of Terrestrial Vegetation

- The proposed development must be focussed within the development footprint area approved for development.
- The project construction footprints must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary / unauthorised footprint expansion into the surrounding areas may take place.
- The proposed development must refrain from encroaching into- and significantly impacting on the remaining natural area situated around the development site.
- No site construction camp to be established within the recommended buffer zone or in any natural surrounding areas outside the assessment area.

- Adequately fence off the construction areas and ensure that no construction activities, machinery or equipment operate or impact outside the fenced off areas or within the buffer zone or the remaining natural areas surrounding the development site.
- Existing roads and dirt tracks in close proximity to the proposed project area must be used during construction. No new roads or dirt tracks to be constructed or implemented outside the fenced off construction areas or within the buffer zone or the remaining natural areas surrounding the development site.

10.1.7 Control of Alien Invasive Species

- Alien invasive species individuals currently on site must be actively eradicated from the assessment area and adequately disposed of in accordance with the National Environmental Management: Biodiversity Act (Act 10 of 2004); Alien and Invasive Species Regulations, 2014.
- An active alien invasive species clearance and eradication initiative must be implemented for the improvement of the ephemeral water drainage line' ecological integrity.
- Implement an adequate Alien Invasive Species Establishment Management and Prevention Plan during the construction phase. Such a management plan must be compiled by a suitably qualified and experienced ecologist.
- Areas within and immediately surrounding the proposed development footprints must be adequately rehabilitated as soon as practicably possible after construction in order to prevent significant alien invasive species establishment.
- No site construction camp to be established within the recommended buffer zone or in any natural surrounding areas outside the assessment area.
- Adequately fence off the construction areas and ensure that no construction activities, machinery or equipment operate or impact outside the fenced off areas or within the buffer zone or the remaining natural areas surrounding the assessment area.
- Existing roads and dirt tracks in close proximity to the proposed project area must be used during construction. No new roads or dirt tracks to be constructed or implemented outside the fenced off construction areas or within the buffer zone or the remaining natural areas outside the development area.

10.1.8 Erosion Control

Construction activities will require the removal of vegetation cover, potentially resulting in soil erosion and subsequent impacts on surface water quality due to uncontrolled rainwater run-off or mechanical / wind action. The following measures are necessary to minimise impacts:

- An adequate Storm Water and Erosion Management Plan must be implemented for the entire assessment area during the construction phase. This must be done to sufficiently manage storm water runoff in order to prevent any significant erosion from occurring.
- Areas within and immediately surrounding the proposed development footprints must be adequately rehabilitated as soon as practicably possible after construction in order to prevent significant erosion.
- Clearance of vegetation should be restricted to the absolute minimum required to facilitate construction activities to proceed. No protected plant species shall be removed without a permit. Disturbance of topsoil and vegetation rootstock must be minimised as far as possible.
- Appropriate drainage systems will be built to accommodate the surface water movement from the rain and wind.
- Construction activities shall take place only within the approved demarcated area. Appropriate drainage facilities must be constructed to make sure water runs smoothly downstream.
- Top soil layer will be kept for rehabilitation and will be adequately stored to protect it from erosion.
- Areas where construction has been finished should immediately be re-vegetated.

10.1.9 Contamination of Land

Land contamination may occur as a result of fuel and oil leaks or spills and / or poor fuel, chemical and waste storage.

- The storage areas shall be securely fenced and secured, and appropriately marked to indicate the goods in the storage. Material Safety Data Sheets (MSDSs) should be kept for all hazardous materials on site.
- All hazardous substances and stocks such as diesel, oils, detergents, etc., shall be stored in areas with impervious flooring such as concrete and properly banded. Drip pans, other impervious surface, shall be installed in such storage areas with a view to prevent soil and water pollution.
- Dedicated impervious areas should be designated for concrete mixing and the spillage from concrete mixed should be cleaned immediately.
- The waste management strategy on the construction site should be hinged on the waste hierarchy model of 'reduce, reuse and recycle' waste in order to reduce the ultimate impact on the environment.
- All used oils, grease or hydraulic fluids shall be placed in appropriate impervious containers and these receptacles will be removed from the site on a regular basis for disposal at a licensed disposal facility or sent for recycling / reuse with a registered facility.
- Residues from machinery maintenance and other sources contaminated with hazardous waste should be stored in proper containers that avoid seepage to ground.
- Spills should be cleaned up immediately by removing the spillage together with the polluted soil and by disposing of them at a recognised facility. In areas where the spills are some, an absorbent agent can be used, and the area treated in situ.
- Adequate waste receptacles shall be made available and all waste shall be adequately stored so that it does not pose a pollution risk. General waste is to be disposed of through the municipal service. Any other waste will be disposed of through only licensed waste disposal facilities.

10.1.10 Surface Water Quality

Poor chemical storage and poor waste management practices may lead to the contamination of water sources. Sewage and sanitary effluent have the potential to adversely affect the quality of receiving water bodies unless properly managed. To eliminate the risk of contamination the following measures must be instituted.

- Chemical toilets shall be used during the construction stage and a registered service provider shall be contracted to service the toilets regularly.
- Suitable covered receptacles for waste shall be available at all times and conveniently placed for the disposal of waste.
- Warehouse floors and workshop areas should be of concrete. Drainage from warehouse is collected separately with trap for oil or fuels oil. Trap containers when full will be removed properly stored and sent out to oil waste management company.
- Refuelling, fuel loading / unloading, oil change-outs, waste storage and disposal activities must be carefully managed to prevent spillages.
- Adequate toilets must be available on site for use by construction staff at all times. The digging of pit latrines for this purpose is not allowed under any circumstances. Should chemical toilets be used, an appropriate contractor must be employed to service these facilities on an ongoing basis.
- Spills or overflows from chemical or other toilets used by construction staff must be dealt with by a sanitation expert immediately.
- Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and treated prior to discharge or removed from the site for appropriate disposal at a recognised facility.

10.1.11 Water Usage

- Any water that is used which does not emanate from Municipality supplies must be registered and authorised by the Department of Water and Sanitation (DWS) prior to usage commencement.
- The contractor shall promote responsible water use by all personnel.

10.1.12 Fauna and Flora

Fauna and flora are negatively impacted by the clearance of vegetation, noise from construction activities (disturbance) and gathering / hunting of flora and fauna by workers. The following measures are necessary to mitigate impacts:

- Topsoil shall be removed and kept for use during rehabilitation.
- The Contractor shall be responsible for the removal of alien vegetation within areas affected by the construction activities including cleared ground and topsoil stockpiles. Equipment used should be regularly washed down to avoid transporting seeds (invasive species) or plant diseases.
- No protected or endangered plant species shall be removed without a permit or license.
- The rehabilitation activities require the re-planting of vegetation in any areas cleared for the construction activities. This will promote soil stability, improve the visual environment and provide faunal habitat.
- Hunting / gathering by construction workers must not be permitted.
- Localised habitat features such as nests, dens or burrow sites should be avoided as much as possible. In addition, care should be taken in working in areas of active nesting, spawning, and feeding areas where present on site.

10.1.13 Safety

- The Contractor shall be responsible for the protection of the public and public property from any dangers associated with the construction and operation of the road activities.
- All work should be handled in accordance with the Occupational Health and Safety Act (No. 85 of 2003) (OHSA) and adequate safety precautions taken, and suitable sanitation facilities provided in line with the requirements of OHSA. It is the duty of the Contractor to ensure that all protective measures against accidents are done.
- Any works / activities which may pose a hazard to humans and / or domestic animals are to be protected or cordoned off and, if appropriate, warning signage erected.
- Appropriate security is to be provided at the site to protect equipment and provide for a safe construction site and works areas.
- Any damage caused as a result of the construction activities shall be repaired to the satisfaction of the project manager and owner.

10.1.14 Historical Archaeological and Heritage Impacts

- Should any cultural or archaeological artefacts be found during construction activities, operations must cease immediately, and the area secured and SAPS, the South African Heritage Resources Agency (SAHRA), the Mpumalanga Provincial Heritage Resources Agency and other relevant authorities informed immediately.
- No site of archaeological or historical significance may be moved without a permit from the SAHRA. Any permitted removal of any archaeological or historical matter must be done under the strict supervision of a qualified registered archaeologist.

10.2 OPERATIONAL PHASE

10.2.1 REHABILITATION

- On completion of construction operations, all buildings, structures or objects on the camp / office site shall be demolished and removed.
- Where office / camp sites have been rendered devoid of vegetation / grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
- On completion of construction operations, the areas shall be cleared of any contaminated soil, which must be dumped as per the waste management plan.
- All infrastructure, equipment, plant, temporary housing and roads and other items used during the construction period will be removed from the site.
- Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the area and disposed of at a registered waste disposal facility. It will not be permitted to be buried or burned on the site
- Disturbed areas should be left in a safe and stable manner. Preventative measures may be necessary to construct adequate drainage structures including ditches and other structures to facilitate the movement of surface water.
- Photographs of the camp and office sites, before and during the construction and after rehabilitation, shall be taken at selected fixed points and kept on record.
- The disturbed surfaces shall then be ripped or ploughed and the topsoil previously stored shall be spread evenly to its original depth over the whole area. The area shall then be fertilised if necessary (based on a soil analysis).

11 HANDLING OF EMERGENCIES

- The Contractor should identify all situations that can lead to emergency situations and provide response strategies. The situations should include fire and major chemical spills.
- Contact details of all departments / service providers to be contacted in case of an emergency shall be made available to employees.
- Equipment for dealing with emergencies such as spill kits, firefighting equipment, first aid boxes etc., shall be made available and personnel properly trained in its use.
- All staff on site should be trained on how to handle emergency situations and emergency drills / rehearsals should be conducted periodically to ensure that staff prepared.

12 METHOD STATEMENTS

The Contractor shall submit written Method Statements for all environmentally sensitive aspects of the work. It should be noted that Method Statements must contain sufficient information and detail to mitigate the potential impacts of the works on the environment. The Contractor will also need to thoroughly understand what is required of him / her in order to undertake the works. Work shall not commence until Method Statements have been prepared and are in place.

13. EMPR FOR THE PPRP, PHASE 3 – WIND ENERGY FACILITY

Construction Phase

Aspect	Objective/Outcome	Action	Frequency	Responsible Party
Heritage Resources				
Damage or destruction of palaeontological resources	Minimise the risk of significant palaeontological resources being disturbed.	<p>IDENTIFICATION, AVOIDANCE / MITIGATION</p> <ul style="list-style-type: none"> Appoint a professional palaeontologist to study the preconstruction geo-technical report in order to ascertain the potential impacts to surface layers and whether any monitoring may be required. Appointed palaeontologist should monitor any excavations of > 60 cm deep into Ecca bedrock in order to record and/or sample any fossils that might be revealed; and Conduct an audit to verify that the necessary permits are obtained by the palaeontologist, if required. Should any objects of archaeological or palaeontological remains be found during construction activities, work must immediately stop in that area and the Environmental Control Officer (ECO) must be informed. The ECO must inform the South African Heritage Recourse Agency (SAHRA) and contact an archaeologist and/or palaeontologist, depending on the nature of the find, to assess the importance and rescue them if necessary (with the relevant SAHRA permit). No work may be resumed in this area without the permission from the ECO and SAHRA. If the newly discovered heritage resource is considered significant a Phase 2 assessment may be required. A permit from the responsible heritage authority will be needed. 	Pre-construction, as soon as geotechnical report is available	Project Developer
Impact of site clearing to archaeological heritage resources	Minimise the risk of significant archaeological sites being disturbed	<p>AVOIDANCE</p> <ul style="list-style-type: none"> Avoid the heritage resources identified in with a buffer distance of 20 m. 	Once-off	<ul style="list-style-type: none"> Contractor Appointed archaeologist ECO

		<ul style="list-style-type: none"> • Ensure that no activity takes place outside of the authorized construction footprint. • If the sites can be avoided, then the Environmental Control Officer (ECO) should ensure that they are cordoned off and/or protected from harm as required. • Should any objects of archaeological or palaeontological remains be found during construction activities, work must immediately stop in that area and the Environmental Control Officer (ECO) must be informed. • The ECO must inform the South African Heritage Recourse Agency (SAHRA) and contact an archaeologist and/or palaeontologist, depending on the nature of the find, to assess the importance and rescue them if necessary (with the relevant SAHRA permit). No work may be resumed in this area without the permission from the ECO and SAHRA. • If the newly discovered heritage resource is considered significant a Phase 2 assessment may be required. A permit from the responsible heritage authority will be needed. In the event that the AVOID action cannot be implemented: <p>MITIGATION</p> <ul style="list-style-type: none"> • Ensure that all heritage resources requiring mitigation are mitigated prior to the start of construction. • Appoint a professional archaeologist to excavate and collect of samples of artefacts from the Stone Age site, and map and record historical ruins. This should happen 6 months prior to construction to allow the archaeologist time to obtain a permit, conduct the work, analyse the material and obtain a positive comment from South African Heritage Resource Agency (SAHRA). 		
Avifauna				
Avifauna habitat destruction for site clearing	Minimise the risk of avifaunal habitat destruction	<p>IDENTIFICATION, AVOIDANCE / MITIGATION</p> <ul style="list-style-type: none"> • Preconstruction walk through of the facility in order to locate species of conservation concern that can be 	Once-off	<ul style="list-style-type: none"> • Contractor • Appointed ornithologist • ECO

		translocated as well as comply with permitting conditions		
	Minimise disturbance footprint Rehabilitation of habitat	<p>AVOIDANCE</p> <ul style="list-style-type: none"> Keep the footprint of the disturbed area to the minimum and designated areas only. Adhere to existing roads. <p>MANAGEMENT / MITIGATION</p> <ul style="list-style-type: none"> Vegetate and irrigate open areas to limit erosion, but take care not to promote erosion by irrigating. Minimise removal of vegetation during construction and operation will be minimised to reduce the risk of excessive open areas occurring. All disturbed sites must be rehabilitated. Removal of vegetation must be followed closely by rehabilitation within 3 months of disturbance. 		<ul style="list-style-type: none"> Operations and maintenance contractor Ecological restoration/rehabilitation specialist as advisor ECO
Loss of avifauna diversity due to disturbance and barrier effects due to establishment of facility	Mitigate potential transformation, fragmentation and destruction of avifauna habitat	<p>MITIGATION</p> <ul style="list-style-type: none"> The footprint of the construction phase, including laydown yards, roads and buildings must be kept to a minimum. So as to not disturb birds or destroy available habitat. 	Once-off	<ul style="list-style-type: none"> Operations and maintenance contractor ECO
		<p>MONITORING</p> <ul style="list-style-type: none"> Monitor bird fatalities – the monitoring plan must indicate what species are affected and at what time/season these occur, and should follow Bird life SA recommendations. 	Continuously	<ul style="list-style-type: none"> Operations and maintenance contractor Ornithologist as advisor
Fauna and Flora				
Impacts to fauna and flora during site preparation and construction.	Revegetation and rehabilitation	<p>MANAGEMENT</p> <ul style="list-style-type: none"> Removal of vegetation must be followed closely by rehabilitation by specialists qualified in this vegetation type's remediation 	Once-off	<ul style="list-style-type: none"> Operations and maintenance contractor Ecological restoration/rehabilitation specialist as advisor ECO
	Minimise the risk of soil erosion and	MANAGEMENT / MITIGATION	Continually	<ul style="list-style-type: none"> Operations and maintenance contractor

	indirect water contamination	<ul style="list-style-type: none"> • Vegetate and irrigate open areas to limit erosion and dust. • Improving growth conditions through decreasing runoff, increasing infiltration and increasing the build-up of organic material to reduce soil erosion risk. • Increased water runoff due to removal of vegetation could act as a pathway to contaminate water sources with sediment. The contamination of water by hazardous materials is also a real possibility and all possible precautions must be taken to avoid this 		<ul style="list-style-type: none"> • Ecological restoration/rehabilitation specialist as advisor • ECO
	Reduce risk to protected animals	<p>MANAGEMENT / MITIGATION</p> <ul style="list-style-type: none"> • Construction phase activities will increase the local dust levels and noise level, which includes noise and dust from heavy machinery and trucks. The increased traffic of heavy-duty vehicles and machinery will pose a threat to animals in the area. <p>MONITORING</p> <ul style="list-style-type: none"> • If the following protected animals are encountered, the environmental manager (ECO) must be alerted: <ul style="list-style-type: none"> o Aardvark (<i>Orycteropus afer</i>), o Bat-eared fox (<i>Otocyon megalotis</i>) o Steenbok (<i>Raphicerus campestris</i>) • Special care must be taken during construction not to harm these animals, if afforded the opportunity these animals will move away. 	Continually	<ul style="list-style-type: none"> • Contractor • ECO
Impacts of access control and fencing to plants and animals	<p>Avoid habitat fragmentation</p> <p>Avoid electrocution of small animals (e.g. snakes and Tortoises)</p>	<p>AVOIDANCE</p> <ul style="list-style-type: none"> • Construct all electric fencing with a bottom strand not lower than 30 cm to the ground, in order for tortoises and snakes to pass safely. 	Once-off	<ul style="list-style-type: none"> • Contractor • ECO

Agriculture and soil potential				
Soil erosion	Minimise the risk of soil erosion	MANAGEMENT / MITIGATION <ul style="list-style-type: none"> Implement an effective system of storm water run-off control using bunds and ditches, where it is required (at points where water accumulation might occur). The system must effectively collect and safely disseminate any run-off water from all hardened surfaces and it must prevent any potential down slope erosion. 	Once-off	<ul style="list-style-type: none"> Contractor ECO
Loss of topsoil through soil profile disturbance (such as levelling, excavations, road surfacing)	Proper topsoil management	MANAGEMENT / MITIGATION <ul style="list-style-type: none"> Strip available topsoil from entire area and stockpile for respreading during rehabilitation. Topsoil stockpiles must be conserved against losses through erosion by establishing vegetation cover on them. During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface. Any subsurface spoils from excavations must be disposed of where they will not bury the topsoil of potential agricultural land. 	Once-off when an activity will mechanically disturb the soil below surface in any way	<ul style="list-style-type: none"> Contractor ECO
Dust deposition	Increase security against stock theft and predation	MANAGEMENT / MITIGATION <ul style="list-style-type: none"> Ensure that the security fencing around the facility is jackal proof (whilst still adhering to fencing recommendation of electrical fences allowing 30 cm gap from the ground). Record all periods when the panel area is used for grazing of small stock. Specifically record whether any predation to small stock occurs or not within the panel area. In the event of any predation taking place, the fence must be inspected and repaired to be jackal proof again. 	Once-off	<ul style="list-style-type: none"> Contractor ECO
Visual Resources				
Visual intrusion on existing views of sensitive visual receptors	Minimise visual intrusion	AVOIDANCE Nighttime construction should be avoided where possible.	Continually	<ul style="list-style-type: none"> Contractor ECO

		MANAGEMENT / MITIGATION <ul style="list-style-type: none"> • Implement a phased approach to preparation (i.e. clearance of vegetation, grading, contouring and compacting) and construction of the solar field in a practical sense to minimise the area of soil exposed and duration of exposure; • Clearly demarcate and monitor construction boundaries. • Demarcate and strictly control parking areas so that vehicles are limited to specific areas only. • Night lighting of the construction sites should be minimised within requirements of safety and efficiency. 		
Night lighting impacts	Minimise impacts to the regional nightscape	MANAGEMENT/MITIGATION <ul style="list-style-type: none"> • A lighting plan that documents the design, layout and technology used for lighting purposes should be prepared, indicating how nightscape impacts will be minimised; • The lighting plan should include a process for promptly addressing and mitigating complaints about potential lighting impacts; • Lighting of the facility should not exceed, in number of lights and brightness, the minimum required for safety and security; • Low-pressure sodium light sources should be used to reduce light pollution; • Light fixtures should not spill light beyond the project boundary; • Timer switches or motion detectors (within safety requirements) should be used to control lighting in areas that are not occupied continuously. 	Once-off	<ul style="list-style-type: none"> • Contractor • ECO
Socio-Economics				
Expenditure related impacts on aspects such as jobs.	Maximise positive Impacts associated with expenditure on the construction and	MANAGEMENT <ul style="list-style-type: none"> • Maximise positive impacts through tendering, procurement, and employment policies. 	Quarterly auditing of achievement of socio-	<ul style="list-style-type: none"> • Project Developer • Contractor

	operation of the project	<ul style="list-style-type: none"> Set targets for use of local labour and maximise opportunities for the training of unskilled and skilled workers. Use local sub-contractors where possible. 	economic benefit goals with corrective actions if needed	
Social impact associated with an influx of people	Limit impacts associated with the presence of workers and work seekers including those associated with negative impacts on social structures and increased 'social ills' such as increased crime levels, increased alcohol and drug use, increased teenage and unwanted pregnancies, increased prostitution and increases in sexually transmitted diseases (STDs)	MANAGEMENT <ul style="list-style-type: none"> Implement an HIV/AIDS awareness programme for all construction workers at the outset of the construction phase. Make necessary arrangements to enable workers from outside the area to return home over weekends and or on a regular basis during the construction phase. This would reduce the risk posed by non-local construction workers to local family structures and social networks. 	Continually	<ul style="list-style-type: none"> Project Developer Contractor
Impacts on surrounding land owner	Limit impacts on surrounding land owners associated with potential for: - Further deterioration of local roads	MANAGEMENT & MONITORING <ul style="list-style-type: none"> Manage and monitor the movement of workers on and off the site. In this regard the contractors should be responsible for making the necessary arrangements for transporting workers to and from site on a daily basis. Ensure proper disposal of waste, especially plastics. 	Continually	<ul style="list-style-type: none"> Project Developer Contractor

	<ul style="list-style-type: none"> - Increased risk of crime such as stock theft and poaching - Damage to farm infrastructure such as fences - Increased littering - Increased potential for veld fires 			
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Operational Phase

Aspect	Objective/Outcome	Action	Frequency	Responsible Party
Heritage Resources				
Alteration of the cultural and natural landscape by built elements	Reduce visual contrast of infrastructure to the cultural landscape .	MITIGATION <ul style="list-style-type: none"> • Use neutral, earthy-coloured paint on the built elements of the development so as to reduce the visual contrast in the landscape. 	Continually as required	<ul style="list-style-type: none"> • Operations and maintenance contractor
Avifauna				
Bird collisions with turbines and other infrastructure.	Minimise the risk of bird collisions, injuries and fatalities.	MONITORING <ul style="list-style-type: none"> • Monitor bird fatalities – the monitoring plan must indicate what species are affected and at what time/season these occur, and should follow Bird life SA recommendations. • Monitoring must make note of bird species present and absent in terms of Southern African Bird Atlas Project (SABAP2) records for the area. • Preferred habitat and areas of congregation must be noted. 	Continually	<ul style="list-style-type: none"> • Operations and maintenance contractor • Ornithologist as advisor
Fauna and Flora				
Impacts of access control and fencing to plants and animals	Allow movement of grazing animals	MANAGEMENT <ul style="list-style-type: none"> • Employ veld management measures. • Allow gaps in fencing for grazing animal species (mostly livestock, possibly wild animals) to move between grazing areas, during prescribed times of the year. 	As required and established	<ul style="list-style-type: none"> • Operations and maintenance contractor • Landowners/farmers as advisors

	Minimise the impacts of habitat fragmentation			<ul style="list-style-type: none"> • ECO
Agriculture and soil potential				
Soil erosion	Minimise the risk of soil erosion	MANAGEMENT / MITIGATION <ul style="list-style-type: none"> • Implement an effective system of storm water run-off control using bunds and ditches, where it is required (at points where water accumulation might occur). • The system must effectively collect and safely disseminate any run-off water from all hardened surfaces, and it must prevent any potential down slope erosion. 	Once-off	<ul style="list-style-type: none"> • Operations and maintenance contractor • ECO
Visual Resources				
Landscape impact on a rural agricultural landscape containing large scale electrical infrastructure	Minimise visual landscape impact	MANAGEMENT / MITIGATION <ul style="list-style-type: none"> • Ensure that structures remain as non-reflective as possible, and buildings remain as unobtrusive as possible by implementing a building maintenance. • Maintenance of access roads should not cause further disturbance and damage to the surrounding landscape. 	Continually	<ul style="list-style-type: none"> • Operations and maintenance contractor • ECO
Visual intrusion on the views of sensitive visual receptors	Minimise visual intrusion	MANAGEMENT / MITIGATION Solar Arrays <ul style="list-style-type: none"> • Maintain rehabilitated surfaces until a self-sustaining stand of vegetation is established and visually adapted to the undisturbed surrounding vegetation. • No new disturbance should be created during operations without approval by the Environmental Officer; Restoration of disturbed land should commence as soon after disturbance as possible. • Dust and noxious weed control should be part of maintenance activities. • Road maintenance activities should avoid damaging or disturbing vegetation. • Painted features should be maintained and repainted when colour fades or paint flakes. 	Continually as required	<ul style="list-style-type: none"> • Operations and maintenance contractor • ECO

		<p>Buildings</p> <ul style="list-style-type: none"> • Use appropriately coloured materials for structures to blend in with the backdrop of the project where this is technically feasible and the colour or paint will not have a deleterious effect on the functionality of the structures; • Appropriate colours for smooth surfaces often need to be two to three shades darker than the background colour to compensate for shadows that darken most textured natural surfaces; • Materials, coatings and paints should be chosen based on minimal reflectivity where possible; and • Paint grouped structures the same colour to reduce visual complexity and contrast. 		
Night lighting impacts	Minimise impacts to the regional nightscape	<p>MANAGEMENT/MITIGATION</p> <ul style="list-style-type: none"> • A lighting plan that documents the design, layout and technology used for lighting purposes should be prepared, indicating how nightscape impacts will be minimised; • The lighting plan should include a process for promptly addressing and mitigating complaints about potential lighting impacts; • Lighting of the facility should not exceed, in number of lights and brightness, the minimum required for safety and security; • Low-pressure sodium light sources should be used to reduce light pollution; • Light fixtures should not spill light beyond the project boundary; • Timer switches or motion detectors (within safety requirements) should be used to control lighting in areas that are not occupied continuously. 	Once-off	<ul style="list-style-type: none"> • Operations and maintenance contractor • ECO
Socio-Economics				
Expenditure related impacts on aspects such as jobs.	Maximise positive impacts associated with expenditure on the construction	<p>MANAGEMENT</p> <ul style="list-style-type: none"> • Maximise positive impacts through tendering, procurement and employment policies. 	Yearly auditing of achievement of socio-economic benefit goals	<ul style="list-style-type: none"> • Project Developer • Operations and maintenance contractor

	and operation of the project	<ul style="list-style-type: none"> Set targets for use of local labour and maximise opportunities for the training of unskilled and skilled workers. Use local sub-contractors where possible. 	with corrective actions if needed	
Social impact associated with an influx of people	Limit impacts associated with the presence of workers and work seekers including those associated with negative impacts on social structures and increased 'social ills' such as increased crime levels, increased alcohol and drug use, increased teenage and unwanted pregnancies, increased prostitution and increases in sexually transmitted diseases (STDs)	MANAGEMENT & MONITORING <ul style="list-style-type: none"> Implement and apply the Code of Conduct established for the project prior to its commencement with assistance from the stakeholder Monitoring Forum for the project. Continue with the Monitoring Programme set up prior to the commencement of construction and respond to its findings. 	Ongoing and with regular Monitoring Forum meetings	<ul style="list-style-type: none"> Project Developer Operations and maintenance contractor
Impacts on surrounding land owner	Limit impacts on surrounding land owners associated with potential for: <ul style="list-style-type: none"> - Further deterioration of local roads - Increased risk of 	MANAGEMENT & MONITORING <ul style="list-style-type: none"> Implement and apply the Code of Conduct established for the project prior to its commencement with assistance from the stakeholder Monitoring Forum for the project. Continue with the Monitoring Programme set up prior to the commencement of construction and respond to its findings. 	Ongoing and with regular Monitoring Forum meetings	<ul style="list-style-type: none"> Project Developer Operations and maintenance contractor

	crime such as stock theft and poaching - Damage to farm infrastructure such as fences - Increased littering - Increased potential for veld fires			
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14 ALIEN INVASIVE MANAGEMENT PLAN

OBJECTIVE/OUTCOME: Avoid the establishment and spread of alien invasive species during all phases of the development

- Vegetate and irrigate open areas to limit erosion, but take care not to promote erosion by irrigating.
- All encountered alien plant species recorded on site should be removed.
- Remove alien vegetation, preferably as juveniles, with caution to prevent the spread of seeds and therefore the plants.
- Monitor alien plants initially every three months for one year after closure and rehabilitation.
- Monitor for alien plants after development for between 5-7 years on an annual basis. Table below, Alien plant control mechanisms for key invasive species that may be present / establish on site.

Species	Control mechanism
<i>Agave americana</i>	Chemical control with triclopyr (-amine salt) 90 / 270 g/L SL.
<i>Eucalyptus camuldulensis</i>	Mechanical control for juveniles in the form of hand-pulling. Adults can be cut to stumps and treated with a herbicide: Clopyralid / triclopyr (-amine salt) 90 / 270 g/L SL.
<i>Opuntia ficus-indica</i>	Monosodium methanearsonate (MSMA) can be used in addition to glyphosphate 359g/L

15 PLANT RESCUE AND PROTECTION PLAN

OBJECTIVE/OUTCOME: Avoid and mitigate potential impacts to listed and protected plant species and their habitats

- Preconstruction walk through of the facility in order to locate species of conservation concern that can be translocated as well as comply with permitting conditions.
- Removal of vegetation must be followed closely by rehabilitation by specialists qualified in this vegetation type's remediation.
- Prevent and manage the establishment of alien vegetation.
- Minimise removal of vegetation during construction and operation will be minimised to reduce the risk of excessive open areas occurring.
- All disturbed sites must be rehabilitated.

- Remediation must be completed by qualified personnel with the correct equipment in the correct season (wet season).

16 RE-VEGETATION AND HABITAT REHABILITATION PLAN

OBJECTIVE/OUTCOME: Re-vegetate open areas and rehabilitate disturbed areas

- Removal of vegetation must be followed closely by rehabilitation by specialists qualified in the specific vegetation type's remediation.
- Vegetate and irrigate open areas to limit erosion and dust.
- Take care not to promote erosion by irrigating.
- Improving growth conditions through decreasing run-off, increasing infiltration and increasing the build-up of organic material to reduce soil erosion risk.
- Minimise removal of vegetation during construction and operation will be minimised to reduce the risk of excessive open areas occurring.
- All disturbed sites must be rehabilitated.
- Site remediation should be implemented using indigenous, local plant species, e.g.
 - o Cynodon dactylon
 - o Digitaria eriantha
 - o Eragrostis plana
 - o Heteropogon contortus
 - o Themeda triandra
- Remediation must be completed by qualified personnel with the correct equipment in the correct season (wet season).
- Removal of vegetation must be followed closely by rehabilitation within 3 months of disturbance.

17 STORM WATER MANAGEMENT PLAN

OBJECTIVE/OUTCOME: Manage storm water runoff to prevent adverse impacts to terrestrial and aquatic ecosystems.

- Implement an effective system of storm water run-off control using bunds and ditches, where it is required (at points where water accumulation might occur).
- The system must effectively collect and safely disseminate any run-off water from all hardened surfaces and it must prevent any potential down slope erosion.
- Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water run-off control system and to specifically record the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.

18 FIRE MANAGEMENT PLAN

OBJECTIVE/OUTCOME: Reduce the risk of fire in the grassland environment

- Construct fire-breaks around the site/footprint area before any other construction begins.

- Prohibit smoking on-site or alternatively indicate designated smoking areas for staff.
- Prohibit open fires.
- Designate cooking areas for staff where fire hazard will be insignificant.
- Educate staff of the dangers of open and unattended fires.
- Educate staff as to proper fire safety.
- Enforce proper waste management including disposal of flammable material (e.g. cigarette butts and packaging).
- Place firefighting equipment at appropriate locations on site and ensure staff are aware of such equipment and associated procedure.

19 EROSION MANAGEMENT PLAN

OBJECTIVE/OUTCOME: Prevent soil erosion and rehabilitate eroded areas.

- Vegetate and irrigate open areas to limit erosion, but take care not to promote erosion by irrigating.
- Re-vegetate with indigenous species such as:
 - o Cynodon dactylon
 - o Digitaria eriantha
 - o Eragrostis plana
 - o Heteropogon contortus
 - o Themeda triandra
- Remove all hard surfaces from site to reduce runoff.
- Strip available topsoil from entire area and stockpile for re-spreading during rehabilitation.
- Topsoil stockpiles must be conserved against losses through erosion by establishing vegetation cover on them.
- During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface.
- Any subsurface spoils from excavations must be disposed of where they will not bury the topsoil of potential agricultural land.
- Establish an effective record keeping system for each area where soil is disturbed for constructional and decommissioning purposes.

20 PROTECTION OF HYDROLOGICAL FEATURES MEASURES

OBJECTIVE/OUTCOME: Prevent water contamination

- All water supplied for human consumption throughout the project should comply with the SANS 241:2015.
- Ensure that the use of groundwater should not compromise availability to other users e.g. agricultural and domestic use.
- Exclude wetlands and the associated buffers.
 - o NOTE: Upon completion of this EMP the project developer has optimised their project footprints to avoid ecologically sensitive areas identified by the specialist.

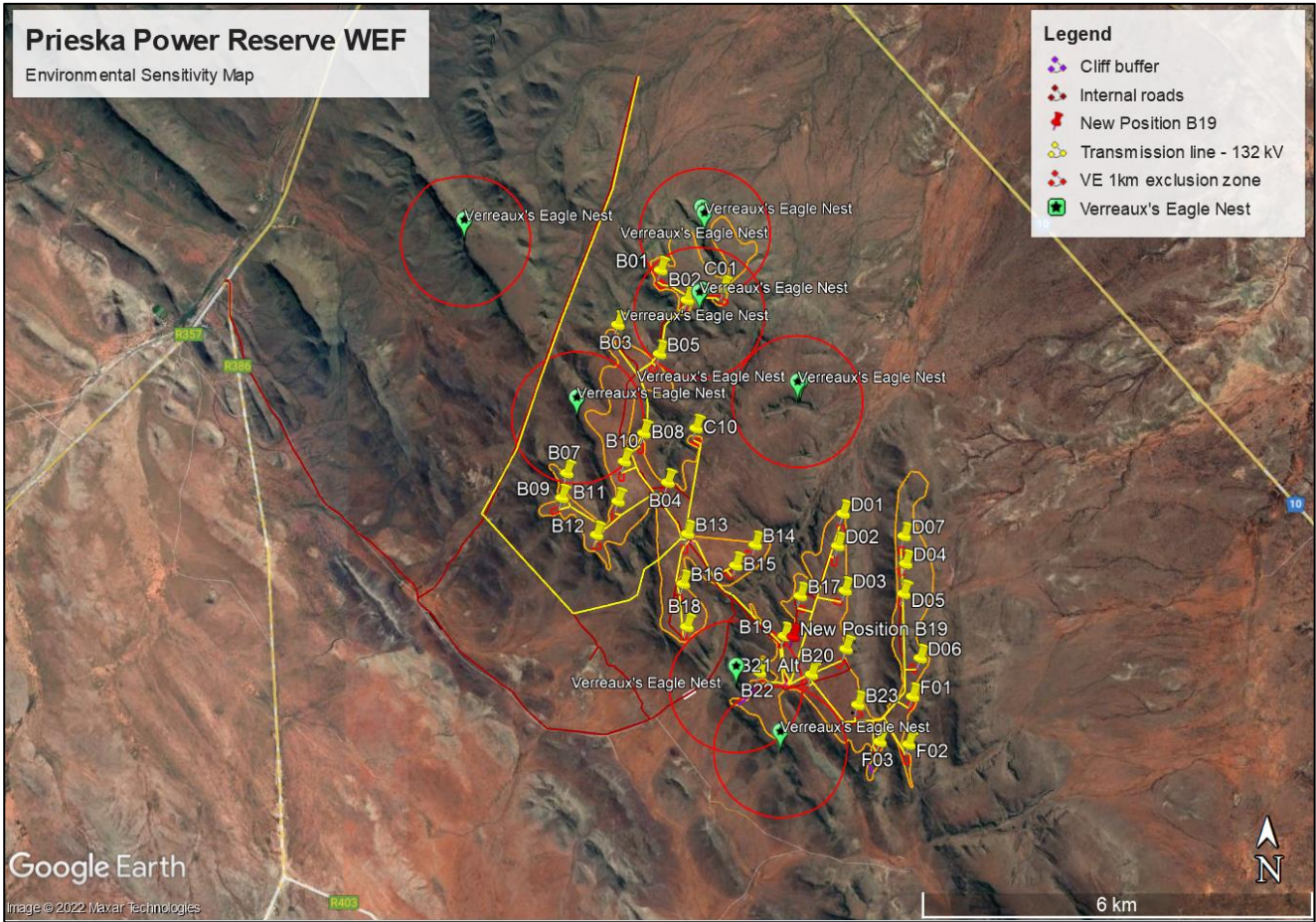
- Implement and maintain a storm water management system that prevents heavy rainfalls outside the pan catchment being diverted into the pan system.
- Measures need to be put in place to ensure that the groundwater is not contaminated.
- The following aspects are considered important:
 - o All vehicles and other equipment (generators etc.) must be regularly serviced to ensure they do not spill oil. Vehicles should be refuelled on paved (impervious) areas. If liquid product is being transported it must be ensured this does not spill during transit.
 - o Emergency measures and plans must be put in place and rehearsed in order to prepare for accidental spillage.
 - o Diesel fuel storage tanks must be above ground in a bunded area.
 - o Engines that stand in one place for an excessive length of time must have drip trays.
 - o Vehicle and washing areas must also be on paved surfaces and the by-products removed to an evaporative storage area or a hazardous waste disposal site (if the material is hazardous).
- If groundwater is abstracted for the project, monitoring of the production borehole water levels, flow rates and quality will be required. This is best done under the guidance of a registered geohydrologist.
- Inform the Department of Water and Sanitation immediately in the event of any surface water or groundwater contamination.

21 WASTE MANAGEMENT PLAN

OBJECTIVE/OUTCOME: Promote proper waste disposal, waste reduction, re-use, and recycling opportunities

- Ensure an adequate and sustainable use of resources.
- Ensure that waste generated during this phase is taken to an appropriate registered landfill.
- Waste separation is encouraged and therefore receptacles should be labelled to reflect the different waste types. All operational waste (concrete, steel, rubbles etc.) to be removed from the site and waste hierarchy of prevention, as the preferred option, followed by reuse, recycling, and recovery must be implemented, where possible.
- Other non-hazardous solid waste (e.g. packaging material) to be disposed of at a licensed landfill.
- All liquid waste (used oil, paints, lubricating compounds and grease) to be packaged and disposed of by appropriate means.
- Adequate containers for the cleaning of equipment and materials (paint, solvent) must be provided as to avoid spillages.
- Waste water from construction and painting activities must be collected in a designated container and disposed of at a suitable disposal point off site.
- Control and implement waste management plans provided by contractors. Ensure that relevant legislative requirements are respected.
- In the event that, during any phase of the development, it is found that the municipal services (waste removal [solid and liquid non-hazardous waste, as well as sewage]) are not sufficiently provided by the Municipality, the Developer should make use of independent/private waste removal services and obtain safe waste disposal docketts.

ENVIRONMENTAL SENSITIVITY MAP



Environmental Sensitivity Map

APPENDIX H: OTHER INFORMATION

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 Case and preparing the Intermediate Business Case.

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

Kind regards,

A handwritten signature in black ink, appearing to be 'Dr Kgosientsho Ramokgopa', written over a horizontal line.

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

