TAAIBOS SOUTH WIND ENERGY FACILITY (WEF), UBUNTU LOCAL MUNICIPALITY, NORTHERN CAPE PROVINCE

DFFE Reference Number: 14/12/16/3/3/2/2187

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

PREPARED FOR:

TAAIBOS SOUTH WIND ENERGY FACILITY RF (PTY) LTD.

PREPARED BY:

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JANUARY 2023

Report Title: Taaibos South Wind Energy Facility: Environmental Impact Assessment Report (EIR)
Report Version: Draft
Department of Forestry, Fisheries and the Environment (DFFE) Reference Number: 14/12/16/3/3/2/2187
CES Project Code: P40700751

Environmental Assessment Practitioner (EAP) Details:

EAP:	**Dr Alan Carter**
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E-mail:	**a.carter@cesnet.co.za**

EAP Declaration

- I act as the independent environmental practitioner in this application;
- 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 declare that there are no circumstances that may compromise my objectivity in performing such work;
- 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 have no, and will not engage in, conflicting interests in the undertaking of the activity;
- 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;
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not;
- All of the particulars furnished by me in this form are true and correct; and
- I will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations.

ENVIRONMENTAL CONSULTANT	RESPONSIBILITY	DATE
Alan Carter	*Project Leader & The EAP*	January 2023
Caroline Evans	*Project Manager & Co-Author*	January 2023
Bruce d'Hotman	*Co-Author*	January 2023

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CONTENTS OF AN ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CONTENT OF THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT (APPENDIX 3, NEMA EIA REGULATIONS)		
3. (1) An environmental impact assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include –		
	CONTENT	**SECTION OF THIS REPORT**
(a)	**Details of –**	***Chapter 1 and Appendix B***
(i)	The EAP who prepared the Report.	
(ii)	The expertise of the EAP, including a *curriculum vitae.*	
(b)	**The location of the development footprint of the activity on the approved site as contemplated in the scoping report, including –**	***Chapter 2***
(i)	The 21-digit Surveyor General code of each cadastral land parcel.	
(ii)	Where available, the physical address and farm name.	
(iii)	Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	
(c)	**A plan which locates the proposed activity or activities applied for as well as the associated infrastructure at an appropriate scale, or, if it is –**	***Chapter 2***
(i)	~~A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken.~~	
(ii)	~~On land where the property has not been defined, the coordinates within which the activity is to be undertaken.~~	
(d)	**A description of the scope of the proposed activity, including –**	***Chapter 2***
(i)	All listed and specified activities triggered and being applied for; and	
(ii)	A description of the activities to be undertaken, including associated structures and infrastructure.	
(e)	**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.**	***Chapter 4***
(f)	**A motivation for the need and desirability for the proposed development, including the need and desirability for the activity in the context of the preferred development footprint within the approved site as contemplated in the accepted scoping report.**	***Chapter 3***
(g)	**A motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report.**	***Chapter 3 and Chapter 7***
(h)	**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 –**	***Chapter 7***
(i)	Details of the development footprint alternatives considered.	***Chapter 7, Chapter 8, Chapter 9 and Chapter 10***
(ii)	Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs.	***Chapter 11 and Appendix A***
(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.	***Chapter 11, Appendix A and Appendix H***
(iv)	The environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.	***Chapter 5 and Chapter 6***
(v)	The impacts and risks identified including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts – (aa) Can be reversed; (bb) May cause irreplaceable loss of resources; and (cc) Can be avoided, managed or mitigated.	***Chapter 9***

(vi)	The methodology used in identifying 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 that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.	
(viii)	The possible mitigation measures that could be applied and level of residual risk.	
(ix)	If no alternative development footprints for the activity were investigated, the motivation for not considering such.	
(x)	A concluding statement indicating the location of the preferred alternative development footprint within the approved site as contemplated in the accepted scoping report.	
(i)	**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 –**	
(i)	A description of all environmental issues and risks that were identified during the environmental impact assessment process.	
(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 adopted mitigation measures.	
(j)	**An assessment of each identified potentially significant impact and risk, including –**	
(i)	Cumulative impacts	***Chapter 8, Chapter 9 and Chapter 10***
(ii)	The nature, significance and consequences of the impact and risk	
(iii)	The extent and duration of the impact and risk.	
(iv)	The probability of the impact and risk occurring.	
(v)	The degree to which the impact and risk can be reversed.	
(vi)	The degree to which the impact and risk may cause irreplaceable loss of resources.	
(vii)	The degree to which the impact and risk can be mitigated.	
(k)	**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;**	
(l)	**An environmental impact statement which contains –**	
(i)	A summary of the key finding of the environmental impact assessment.	
(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	
(iii)	A summary of the positive and negative impacts and risks of the proposed activity and identified alternative.	
(m)	**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**	***Chapter 12***
(n)	**The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment**	
(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**	
(p)	**A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed.**	
(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**	

(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**	
(s)	**An undertaking under oath or affirmation by the EAP in relation to –**	***Chapter 13***
(i)	The correctness of the information provided in the report.	
(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 and affected parties.	
(t)	**Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts.**	
(u)	**An indication of any deviation from the approved scoping report, including the plan of study, including –**	***None at this stage***
(i)	Any deviation from the methodology used in determining the significance of potential environmental impacts and risks	
(ii)	A motivation for the deviation.	
(v)	**Any specific information that may be required by the competent authority.**	***Throughout this Report***
(w)	**Any other matters required in terms of section 24 (4) (a) and (b) of the Act.**	***None at this stage***

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ENVIRONMENTAL IMPACT ASSESSMENT TEAM

Environmental Consultants	**Alan Carter,** Project Leader & The EAP *CES* **Caroline Evans,** Project Manager & Lead Author *CES* **Bruce d'Hotman,** Co-Author & GIS Mapping *CES*
Avifaunal Specialist	**Jon Smallie,** Avifaunal Specialist *WildSkies Ecological Services*
Bat Specialist	**Jonathan Aronson,** Bat Specialist *Camissa Sustainability Consulting*
Ecological Specialist	**Jamie Pote,** Ecological Specialist *Jamie Pote Consulting*
Freshwater Specialist	**Rabia Mathakutha,** Freshwater Specialist *FEN Consulting*
Heritage Specialist	**Nelius Kruger,** Archaeological Specialist *CES*
Noise Specialist	**Morné de Jager,** Acoustic Specialist *Enviro Acoustic Research, MENCO*
Paleontological Specialist	**John Almond,** Paleontological Specialist *Natura Viva cc*
Riverine Rabbit Specialist	**Christy Bragg,** Zoologist *Bohemian Scientist*
Socio-Economic Specialist	**Marchelle Terblanche,** Socio-economic Specialist *INDEX*
Visual Specialist	**Bryony van Niekerk,** Visual Specialist *NuLeaf Planning and Environmental*

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GENERAL SITE INFORMATION

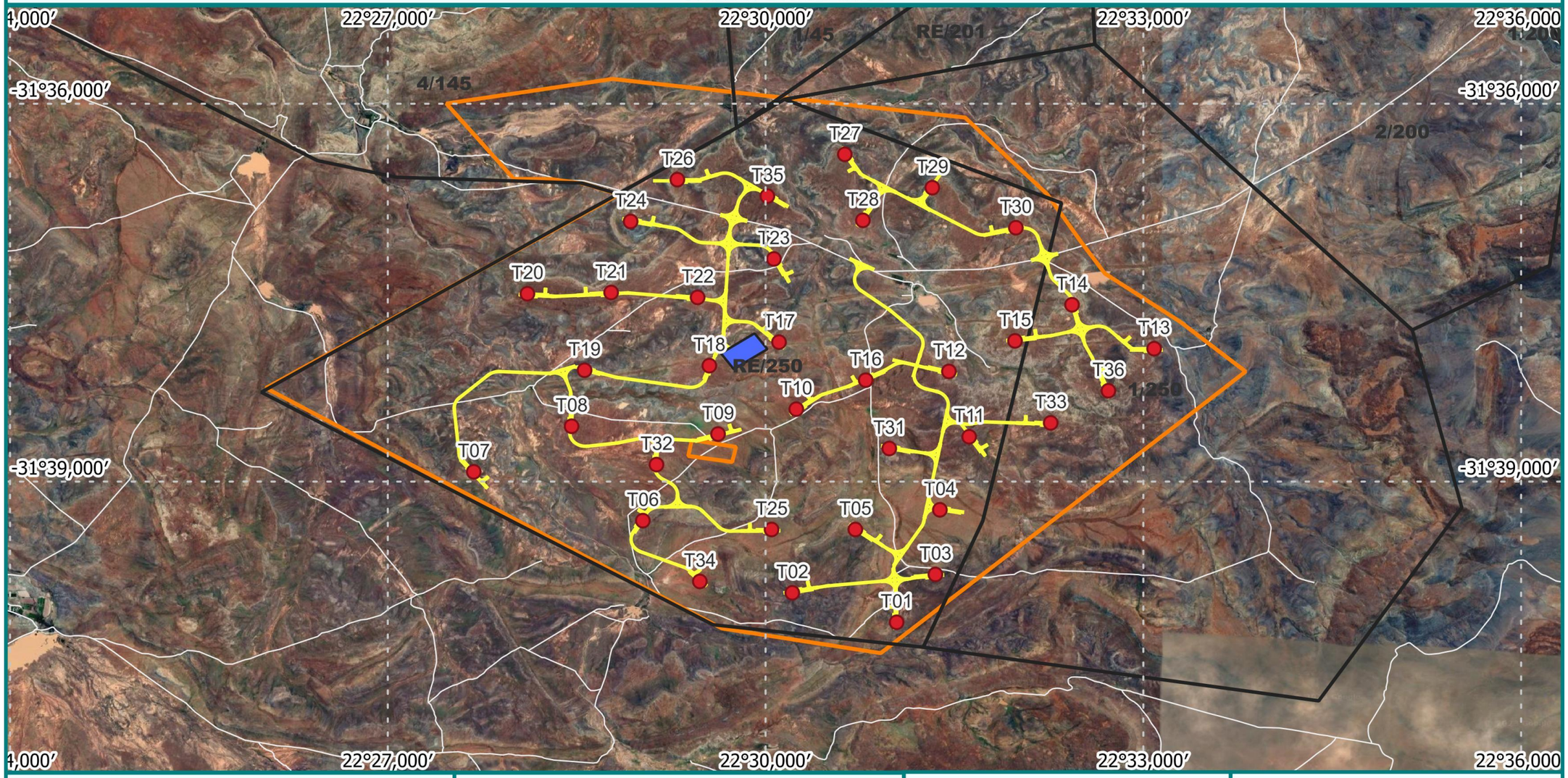
PROJECT SPECIFICATIONS	
Name of Facility	Taaibos South Wind Energy Facility
Province	Northern Cape
District Municipality	Pixley Ka Seme District Municipality
Local Municipality	Ubuntu Local Municipality
Farm Numbers and Portions	4/145 RE/250 1/250
Study Area Extent (ha)	11 919 ha
Facility Footprint (ha)	***CONSTRUCTION PHASE*** Up to 139ha ***OPERATIONAL PHASE*** Up to 85ha
Vegetation Types Present	Upper Karoo Hardeveld (least threatened), and Eastern Upper Karoo (least threatened)
Specialists Studies	***MONITORING AND IMPACT ASSESSMENTS*** Avifaunal Monitoring and Impact Assessment Bat Monitoring and Impact Assessment Riverine Rabbit Monitoring and Impact Assessment ***IMPACT ASSESSMENTS*** Ecological Impact Assessment Freshwater Impact Assessment Heritage (Archaeological) Impact Assessment Noise Impact Assessment Palaeontology Impact Assessment Socio-economic Impact Assessment Visual Impact Assessment

TAAIBOS SOUTH WEF DESIGN SPECIFICATIONS	
Number of turbines	Up to 36
Power output per turbine	Unspecified
Facility output	Up to 270 MW
Turbine hub height	Up to 200 m
Turbine rotor diameter	Up to 240 m
Turbine blade length	Up to 120 m
Turbine tip height	Up to 320 m
Turbine road width	14m to be rehabilitated to 8m
BESS Technology	Solid State (Li-Ion) or REDOX-Flow (High level risk assessment for both) – 10 ha / 2700 MWh

CADASTRAL MAP

TAAIBOS SOUTH WEF

CADASTRAL MAP

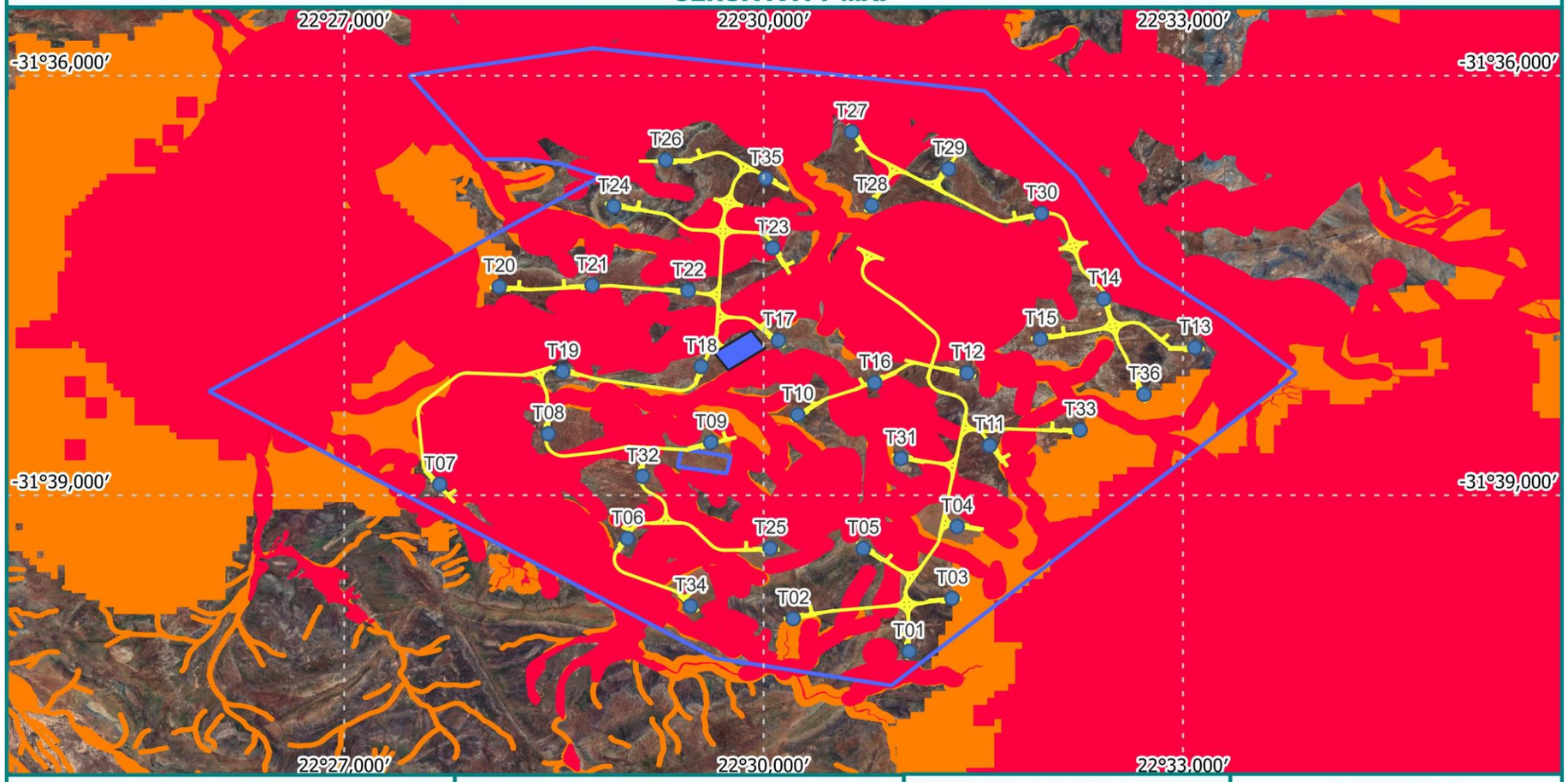


MAP DETAILS	LEGEND	SITE IN SOUTH AFRICA	PRODUCED BY
Date: January 2023 Drawn by: Robyn Thomson Datum: WGS 84	Turbines Roads WEF Boundary Farm Portions Internal Roads Ancillary Infrastructure (Substation, BESS, CTMF, Laydown, Offices)		CES ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES
SCALE 0 2 4 km			**PRODUCED FOR** WKN Windcurrent PNE GROUP

SENSITIVITY MAP

TAAIBOS SOUTH WEF

SENSITIVITY MAP



MAP DETAILS	LEGEND	SITE IN SOUTH AFRICA	PRODUCED BY
Date: January 2023 Drawn by: Robyn Thomson Datum: WGS 84	Turbines Ancillary Infrastructure Internal Roads WEF Boundary No turbines (birds) No-go area (birds) High (bats, riparian areas, wetlands, bird roosts, VERA, riverine rabbit 350m to 500m, noise 1000m, vegetation) Medium (aquatic 100m, watercourse 32m, NFEPA 200m, VERA		CES ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES PRODUCED FOR WKN Windcurrent PNE GROUP

SCALE

0 2 4 km

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1 INTRODUCTION

1.1 BACKGROUND INFORMATION

The Taaibos South Wind Energy Facility (WEF) is located between the towns of Victoria West and Loxton in the Northern Cape Province. The project site is situated in the Ubuntu Municipality (LM) which forms part of the Pixley Ka Seme District Municipality. Studies conducted to date show that this area has favourable wind conditions to operate a wind farm.

CES has been appointed by Taaibos South Wind Energy Facility RF (Pty) Ltd. as the Environmental Assessment Practitioner (EAP) to conduct the necessary EIA Process required in terms of the National Environmental Management Act (NEMA, Act No. 107 of 1998 and subsequent amendments) EIA Regulations (2014 and subsequent 2017 amendments).

1.2 PURPOSE OF THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIR)

The objective of the EIA process, as set out by the 2014 EIA Regulations (as amended in 2017), is to, "*through a consultative process-*

(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—
(i) Nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
(ii) Degree to which these impacts—
(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".

1.3 NATURE AND STRUCTURE OF THIS REPORT

The structure of this report is based on Appendix 3 of GN R. 982 (326), of the EIA Regulations (2014 and subsequent 2017 amendments), which clearly specifies the required content of an Environmental Impact Assessment Report (EIR).

This report is the second of a number of reports which will be produced during the EIA Process. The Scoping Report, which was part of phase 1 of this process, has been completed and accepted by the department. The EIA phase (phase 2) includes an EIR (prepared in accordance with Appendix 3 of GN R. 982), specialist reports (prepared in accordance with Appendix 6 of GN R. 982) and an Environmental Management Programme (EMPr) (prepared in accordance with Appendix 4 of GN R. 982). This phase must also undergo Public Participation Process in accordance with Chapter 6 of GN R. 982.

1.3.1 STRUCTURE

The structure of this EIR is as per Table 1-2 below.

Table 1-2: Structure of the EIR

CHAPTER	HEADING	CONTENT
1	Introduction	Provides a brief overview of the proposed development, details of the EAP and project team and purpose of the EIA report.
2	Project description	Provides a description of the proposed development, the properties on which the development is to be undertaken and the location of the development on the property.
3	Need and Desirability	A description of the need and desirability/motivation for the project.
4	Legal and Policy Framework	Identifies all the legislation and guidelines that have been considered in the preparation of this EIA Report. In addition, this chapter includes a description of the EIA process.
5	Environmental Baseline	Provides a brief overview of the bio-physical characteristics of the site and its environs that may be impacted by the proposed development, compiled largely from published information.
6	Social Baseline	Provides a brief overview of the socio-economic characteristics of the site and its environs that may be impacted by the proposed development, compiled largely from published information.
7	Alternatives	A description of the fundamental alternatives, incremental alternatives and the no-go alternative considered during all phases of the proposed development have been detailed in this Chapter.
8	Findings of the Specialist Reports	This chapter provides a summary of the key findings of each specialist assessment conducted as part of the EIA phase.
9	Impacts and risks identified during the EIA phase	Provides a description of the key impacts that have been identified by the project team and through discussions with I&APs thus far in the EIA Phase. In addition, this chapter covers the impacts identified by each specialist assessment. This chapter also includes mitigation measures that must be implemented. The chapter also describes the cumulative assessment methodology and a summary of the cumulative impacts as identified by each specialist assessment and in general by the EIA phase. This chapter also includes mitigation measures that should be implemented.

CHAPTER	HEADING	CONTENT
10	Sensitivity Analysis	This chapter illustrates the site development sensitivity map that was developed based on specialist and general site information gathered, where the site was classified into areas of GO (unrestricted development), GO-BUT (conditional development) and NO-GO (no development).
11	Public Participation	This chapter describers the Public Participation Process (PPP) conducted to date and that will be conducted as part of the EIA phase.
12	Conclusions and Recommendations	Concludes the report and provides recommendations on the way forward.
13	Appendix A	EAP Affirmation and Declaration
14	Appendix B	Curriculum vitae of EAP team
15	Appendix C	PPP Documentation. Please note that the submitted comments and reports have been included as Appendix I due to volume.
16	Appendix D	Comments and Response Report
17	Appendix E	Specialist Reports
18	Appendix F	Specialist Declarations
19	Appendix G	Environmental Management Programme (EMPr) prepared in accordance with Appendix 4 of the EIA Regulations 2014, as amended. And a Generic EMPr prepared due to the presence of substations.
20	Appendix H	Full Impacts Tables

1.3.2 Assumptions and Limitations

This report is based on currently available information and, as a result, the following limitations and assumptions are implicit–

- This report is based on a project description and site plan, provided to CES by the applicant, which has not been approved by DFFE at this stage of the project. The project description and site plan may undergo iterations and refinements before being regarded as final. A project description based on the final design will be concluded once DFFE has provided feedback on the layout provided in this report.
- Descriptions of the natural and social environments are based on limited fieldwork and available literature.
- It should be emphasised that information, as presented in this document, only has reference to the study area as indicated on the accompanying maps. Therefore, this information cannot be applied to any other area without a detailed investigation being undertaken.

1.4 Details and Expertise of the Environmental Assessment Practitioner

In fulfilment with the legislative requirements, the details of the Environmental Assessment Practitioner (EAP) and the environmental team that prepared this Environmental Impact Assessment Report are provided below.

1.4.1 Dr Alan Carter (The EAP & Project Leader)

Alan Carter is an Executive for the CES East London and Port Elizabeth offices. He holds a PhD in Marine Ecology and a BCom Honours in Financial Accounting and Auditing with extensive training and experience in both financial accounting and environmental science disciplines with CES for the past 20 years and with international accounting firms in South Africa and the USA for 10 years. He has over 30 years of experience in environmental management and has specialist skills in renewable energy, aquaculture, infrastructure,

industrial processes, sanitation, coastal environments, waste management, climate change, environmental auditing and due diligence, and financial feasibility studies.

Alan has the following relevant professional registrations:

- Certified Environmental Assessment Practitioner with the Environmental Assessment Practitioners Association of South Africa (EAPASA);
- Registered as a Professional Environmental Scientist with the South African Council for Natural Scientific Professions (SACNASP);
- Certified ISO14001 Environmental Auditor with Exemplar Global (since 2001), formerly the Registrar Accreditation Board (USA) and Quality Systems Association (Australia) (RABQSA); and
- Certified Public Accountant (Licenced in Texas, USA).

1.4.2 Ms Caroline Evans (Project Manager)

Caroline Beer is a Principal Environmental Consultant & Consultant Manager of CES and based in the Grahamstown branch with 10 years of consulting experience. She holds a BSc degree in Zoology and Environmental Science (with distinction) and a BSc Honours degree in Environmental Science (with distinction), both from Rhodes University. Caroline has completed accredited courses in Environmental Impact Assessments and Wetland Assessments.

Caroline's primary focuses include Project Management and the general Environmental Impact Assessment Process, particularly in the Renewable Energy and Agriculture fields. Examples of fields in which Caroline was the project manager and lead report writer include Wind Energy Facilities (WEF's) and the associated infrastructure (BESS, OHL and other ancillary infrastructure), Solar PV and Agricultural Developments. Her experience with wind energy facilities and associated infrastructure includes the project management and report writing for the Umsombomvu WEF, Coleskop WEF, Dassiesridge WEF, Scarlet Ibis WEF, Albany WEF, Haga Haga WEF, Grahamstown WEF, Kleinsee WEF, Waaihoek WEF and the Great Kei WEF. Caroline is well versed in South African policy and legislation relating to development, particularly in the Eastern Cape Province. In addition, Caroline's project management experience has helped her gain knowledge and experience in the technical and financial management and coordination of large specialist teams, competent authority and stakeholder engagement, and client liaison, Caroline has a strong focus on renewable energy and South African policy and legislation related to development.

1.4.3 Ms Robyn Thomson (GIS)

Robyn Thomson is a Principal Environmental Consultant with 16 Years's experience. She holds a BSc degree with majors in Archaeology, Environmental and Geographical Science, as well as a BSc Honours in Environmental Science from the University of Cape Town and Rhodes University respectively. Robyn's key experience includes renewable energy developments, linear developments, residential developments and mining developments, with her main interest being on renewable energy. Her areas of expertise include project management, basic assessment processes, scoping and EIA process, the environmental authorisation (EA) amendment processes, the public participation process (PPP), water use licence applications and associated reports, and GIS mapping. Robyn completed both the Introduction to Environmental Impact Assessment Procedure and Introduction to Environmental Risk Assessment Short Courses by Coastal and Environmental Services and the Department of Environmental Science, Rhodes University, respectively. In addition, Robyn is a member of the International Association for Impact Assessment (IAIA).

Her experience with renewable energy facilities and associated infrastructure includes the management and report writing for various components of the Chaba, Haga Haga, and Great Kei WEFs in the Great Kei LM, Albany WEF in the Makana LM, and Ngxawabangu WEF in the Intsika Yethu LM, Eastern Cape; the Waaihoek WEF in the Emadlangeni LM, Kwa-Zulu Natal; and the Soyuz WEFs in the Pixley Ka Seme DM, Northern Cape.

PLEASE FIND THE *CURRICULUM VITAE* ATTACHED AS APPENDIX B, CHAPTER 13

2 PROJECT DESCRIPTION

2.1 PROPOSED ACTIVITY

WKN-Windcurrent SA (Pty) Ltd. plans to develop, construct and operate a Wind Energy Facility (WEF) approximately 20km southeast of Loxton in the Northern Cape Province. The project site is situated in the Ubuntu Local Municipality (LM) which forms part of the Pixley ka Seme District Municipality (DM).

The proposed Taaibos South Wind Energy Facility (WEF) will consist of up to 36 turbines, with a total facility output of up to 270MW. The WEF will also include a powerline and switching station in order to connect the WEF to the existing Eskom Substation (this will be applied for in a separate environmental application). The WEF will also include a Battery Energy Storage System (BESS), temporary and permanent laydown areas, an IPP Substation (SS), a Concrete Tower Manufacturing Facility (CTMF), access roads and a construction compound (CC) area. The construction footprint of the proposed WEF will be up to 139ha (inclusive of roads), rehabilitated to an operational footprint of up to 85ha (inclusive of roads).

The summary, the proposed Taaibos South WEF will include:

- Up to 36 turbines with a maximum nominal power output of up to 270MW;
- The proposed WEF will include turbines with a hub height of up to 200m, a rotor diameter of up to 240 m, blade length of up to 120m, and a total tip height of up to 320m;
- Permanent laydown areas adjacent to each wind turbine (up to 3 000 m^2);
- Temporary laydown areas adjacent to each wind turbine (up to 3 000 m^2);
- Foundations (up to 900 m^2) for each wind turbine;
- IPP Substation (SS) of up to 3ha (inclusive of a 33/132kV SS, offices and parking and a permanent SS laydown area);
- Temporary laydown area, CTMF and CC of up to 10ha;
- BESS of up to 10ha (temporary laydown area, CTMF and CC area will be converted to the BESS facility post-construction phase);
- Medium voltage cabling between turbines and the switching stations, to be laid underground where technically feasible; and
- Internal access roads of up 36km constructed at up to 14m wide (construction phase), rehabilitated to 8m wide (operational phase). Existing roads will be used as far as possible. However, where required, internal access roads will be constructed between the turbines.

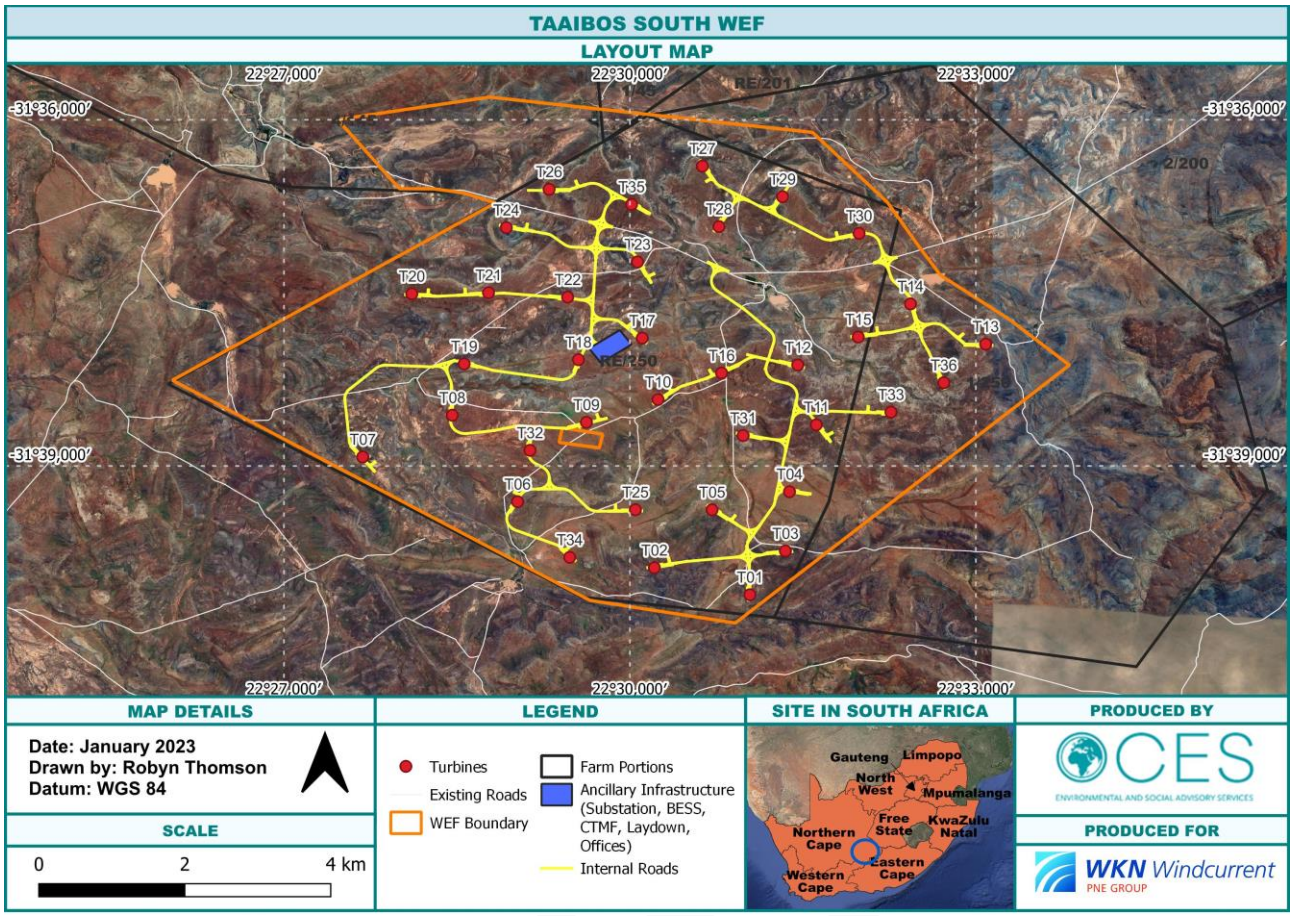

Figure 2-1: Taaibos South WEF Layout Map.

The footprint of the facility is calculated as follows:

Table 2-1: Preliminary Construction Footprint of the Taaibos South WEF.

FACILITY COMPONENT	CONSTRUCTION FOOTPRINT	FINAL FOOTPRINT AFTER REHABILITATION
Permanent Laydown Area	TOTAL 3000 m^2 x 36 turbines = 108 000 m^2 which equates to 10.8 **ha**	TOTAL 3000 m^2 x 36 turbines = 108 000 m^2 which equates to 10.8 **ha**
Temporary Laydown Area	TOTAL 3000 m^2 x 36 turbines = 108 000 m^2 which equates to 10.8 **ha**	TOTAL 0 m^2 x 36 turbines = 0m^2 which equates to 0 **ha**
Turbine Foundation	TOTAL Up to 900m^2 x 36 turbines = 32 400 m^2 which equates to 3**.24 ha**	TOTAL Up to 900m^2 x 36 turbines = 32 400 m^2 which equates to 3**.24 ha**
WEF Substation	33/132kV Substation – 1.5ha Offices and parking – 0.5ha Permanent Laydown – 1ha	33/132kV Substation – 1.5ha Offices and parking – 0.5ha Permanent Laydown – 1ha
BESS	TOTAL 10ha / 2700MWh	TOTAL 10ha / 2700MWh
Temporary Laydown Area, Concrete Tower Manufacturing Facility and Construction Compound	10 ha clearance includes Temporary laydown Construction compound Concrete batching plant Crusher plant All to become area cleared for BESS (above) afterwards.	10 ha clearance includes Temporary laydown Construction compound Concrete batching plant Crusher plant All to become area cleared for BESS (above) afterwards.
New Internal Access Roads (14 m construction, rehabilitated to 8 m during operation)	TOTAL 36 000 m x 14m = 504 000 m^2 which equates to 50.4 **ha**	TOTAL 36 000 m x 8m = 288 000 m^2 which equates to 28.8 **ha**
Upgraded Existing Internal Access Roads	TOTAL 36 000 m x 14m = 504 000 m^2	TOTAL 36 000 m x 8m = 288 000 m^2

FACILITY COMPONENT	CONSTRUCTION FOOTPRINT	FINAL FOOTPRINT AFTER REHABILITATION
	which equates to 50.4 **ha**	which equates to 28.8 **ha**
TOTAL FOOTPRINT:	**138.64 ha** ***of clearing needed for the construction phase of the development of the proposed Taaibos South WEF***	**84.64 ha** ***of clearing remaining during the post-construction operational phase (after rehabilitation) of the proposed Taaibos South WEF***

2.2 PROJECT LOCALITY

The project area is potentially up to 11 919 hectares (ha) in extent (Table 2-1), with a total development footprint of 139 ha (pre-rehabilitation) and 85 ha (post-rehabilitation) depending on the final layout design. It is located in the Ubuntu LM and it is situated approximately 50km to the west of Victoria West. The R63 road connects the towns of Loxton and Victoria West directly to the North of the study area. The direction and distance from the project area to some of the nearest towns are indicated in Table 2-2 below:

Table 2-2: Towns in the vicinity of the Taaibos South WEF.

TOWN NAME	APPROXIMATE DISTANCE	DIRECTION
Victoria West	50km	East
Loxton	20 km	Northwest
Three Sisters	54 km	Southeast
Beaufort West	70 km	South

Table 2-3 indicates the property portions and farm names associated with the Taaibos South WEF project area. The proposed project is situated on approximately 11 919 ha, consisting of three (3) farm portions.

Table 2-3: Taaibos South WEF Properties.

WEF: Taaibos South		
SG DIGIT NUMBER	**FARM NUMBER/PORTION**	**AREA (HA)**
C08000000000014500004	4/145	2980
C08000000000025000001	1/250	4225
C08000000000025000000	RE/250	4714
	TOTAL	**11 919**

The following image shows the corner point coordinates of the proposed Taaibos South WEF. Please see Table 2-4 and Figure 2-2 below.

Table 2-4: Taaibos South WEF Coordinates.

POINT	LATITUDE	LONGITUDE
Point 1	31°38'15.25"S	22°26'02.26"E
Point 2	31°36'46.41"S	22°28'47.11"E
Point 3	31°35'58.42"S	22°27'30.98"E
Point 4	31°36'05.54"S	22°31'34.13"E
Point 5	31°38'08.11"S	22°33'46.44"E
Point 6	31°40'22.24"S	22°30'55.50"E

Figure 2-2: Taaibos South WEF Coordinates.

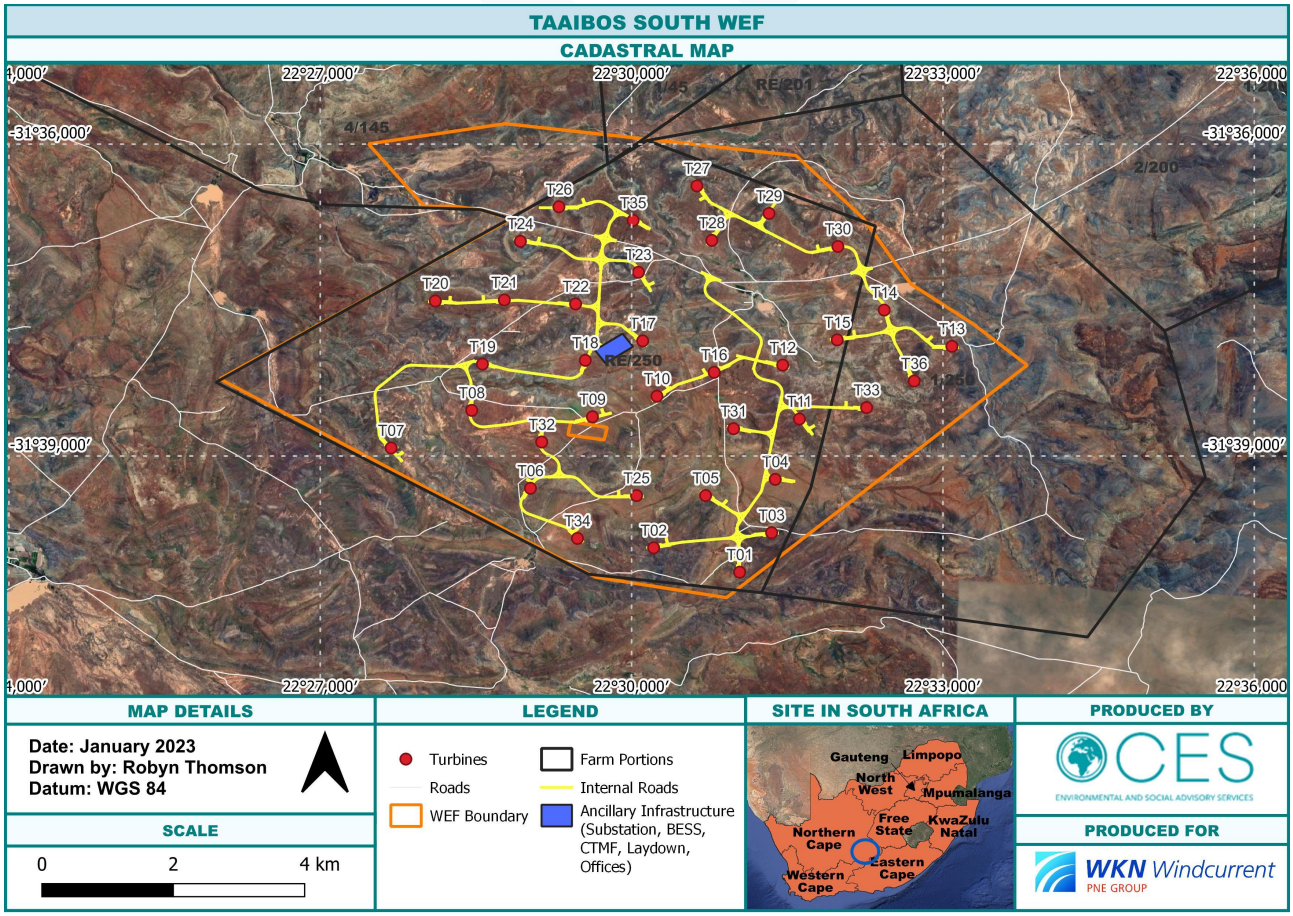

Figure 2-3: Cadastral Map of the Affected Properties within the Proposed Site.

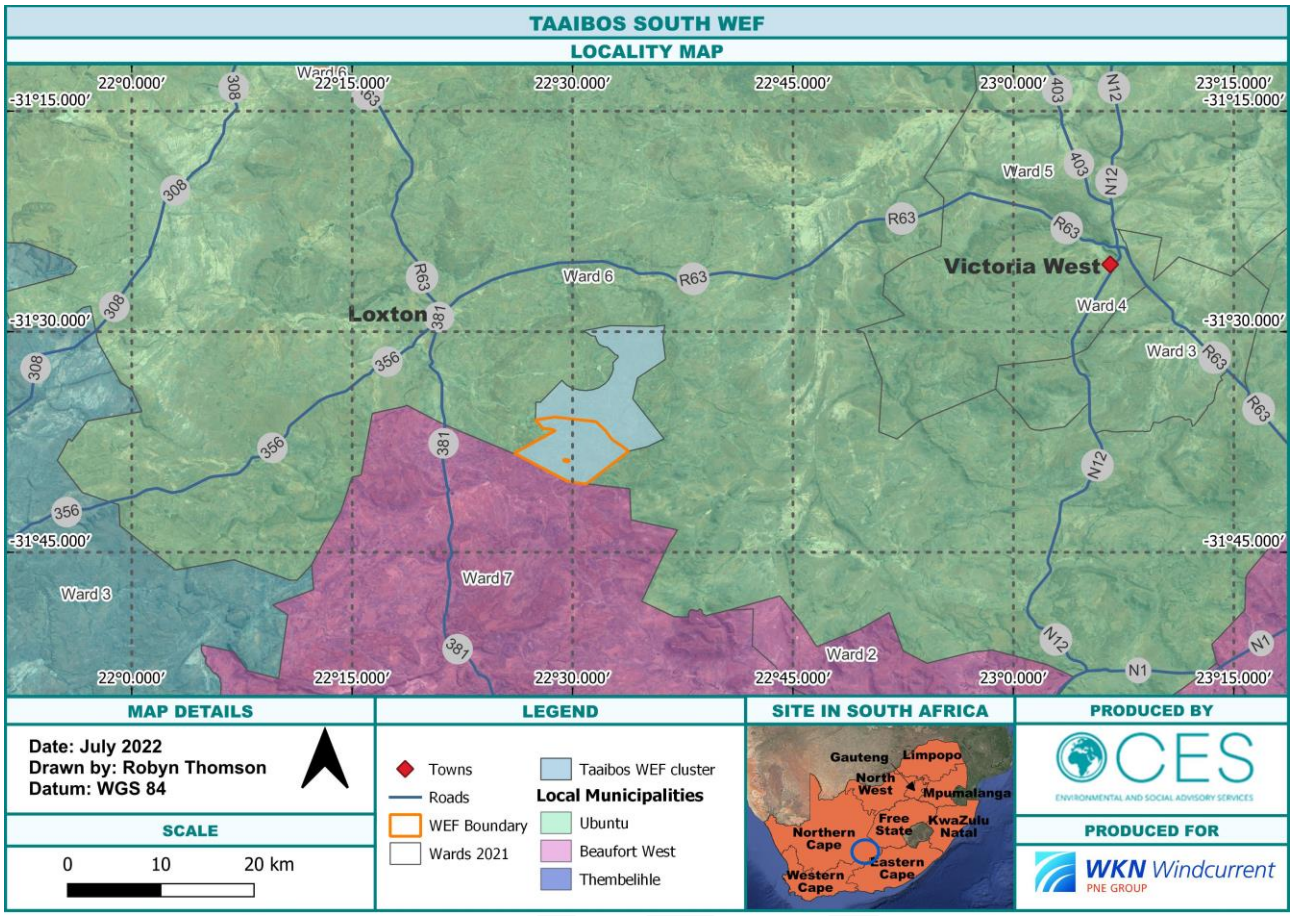

Figure 2-4: Locality Map of the Proposed Taaibos South WEF Site.

2.3 ENVIRONMENTAL AUTHORISATIONS IN SOUTH AFRICA

The regulation and protection of the environment within South Africa, occurs mainly through the application of various items of legislation, within the regulatory framework of the Constitution (Act No. 108 of 1996).

The primary legislation regulating EIAs within South Africa is the NEMA (Act No. 107 of 1998 and subsequent amendments). The NEMA makes provision for the Minister of Environmental Affairs to identify activities which may not commence prior to authorisation from either the Minister or the provincial Member of the Executive Council ("the MEC"). In addition to this, the NEMA also provides for the formulation of regulations in respect of such authorisations.

The NEMA EIA Regulations (2014 and subsequent 2017 amendments) allow for a Basic Assessment (BA) Process for activities with limited environmental impact (listed in GN R. 983/GN R. 327 & GN R. 985/GN R. 324) and a more rigorous two- tiered approach to activities with potentially greater environmental impact (listed in GN R. 984/GN R. 325). This two-tiered approach includes both a Scoping and EIA Process. The proposed Taaibos South WEF project activities trigger the need for a Scoping and EIA Process in accordance with the NEMA EIA Regulations (2014 and subsequent 2017 amendments) Listing Notices 1, 2 and 3 and published in Government Notices No. R. 983 (GN R. 327), R. 984 (GN R. 325) and R. 985 (GN R. 324) respectively. The listed activities which are being applied for are provided in Table 2-5 below.

Table 2-5: Listed activities triggered by the proposed Taaibos South WEF

Activity No(s):	Provide the relevant **Basic Assessment Activity(ies)** as set out in **Listing Notice 1** of the EIA Regulations, 2014 as amended.	Describe the portion of the proposed project to which the applicable listed activity relates.

11	**The development of facilities or infrastructure for the transmission and distribution of electricity– Outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.**	33kV underground (where possible) electrical cables will be laid to transmit electricity generated by the wind turbines to the onsite 132kV IPP switching station (IPP SS).
12	The development of— **(i) infrastructure or structures with a physical footprint of 100 square metres or more;** where such development occurs— **(a) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; — (b) In front of a development setback; or (c) If no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.**	This relates to the proposed turbine footprints, cabling routes, internal roads, substation, laydown areas, construction compound area, BESS and other ancillary infrastructure and operation and maintenance buildings which may be constructed within 32m of watercourse. The final siting of this infrastructure will be refined throughout the process.
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;**	This relates specifically road and cable crossings that may be required during internal road construction and cable installation. The siting of the roads and cable routes will be refined throughout the EIA process of the proposed WEF.
24	**The development of a road– A road with a reserve wider the 13.5 metres, or where no reserve exists where the road is wider than 8 metres.**	The road network will need to be developed and upgraded (using all technically feasible existing farm roads where possible) to ensure that the delivery of turbine parts is possible and that maintenance teams are able to access each individual turbine throughout the lifespan of the project. Roads will be 14m wide during the construction phase and will be rehabilitated to have a final operational footprint of 8m.
28	**Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 01 April 1998 and where such development: Will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.**	The proposed development will entail the rezoning of land from agriculture to special industrial for the placement of the wind energy facility components. The total footprint of the proposed WEF will be up to 85ha in extent (operational phase).
56	**The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre**	The road network will need to be developed and upgraded (using all technically feasible existing farm roads where possible) to ensure that the delivery of turbine parts is possible and that maintenance teams are able to access each individual turbine throughout the lifespan of the project. Roads will be 14m wide during the construction phase and will be rehabilitated to have a final operational footprint of 8m.
Activity No(s):	**Provide the relevant Scoping and EIR Activity(ies) as set out in Listing Notice 2 of the EIA Regulations, 2014 as amended.**	Describe the portion of the proposed project to which the applicable listed activity relates.
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.**	The proposed WEF will include the construction of up to 36 turbines with a maximum output capacity of up to 270MW.
4	**The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such**	The final layout, in terms of WEF ancillary facilities, will determine the volumes needed on site, but at this stage a rough estimate can

	storage occurs in containers with a combined capacity of more than 500 cubic meters.	be calculated as follows: the construction period is expected to last for approximately 24 months, during this time approximately 175m^3 of chemicals which can be classified as dangerous goods will be used. The operational phase is expected to last up to 25 years and will require approximately 200m^3 of chemicals which can be classified as dangerous goods. This equates to a total of approximately 375m^3 of dangerous goods for the lifespan of the proposed WEF.
15	**The clearance of an area of 20 hectares or more of indigenous vegetation.**	The proposed development will include the clearing of indigenous vegetation. The total footprint of the proposed WEF will be approximately 139ha in extent (construction phase) and 85ha in extent (operational phase).
Activity No(s):	Provide the relevant **Basic Assessment Activity(ies)** as set out in **Listing Notice 3** of the EIA Regulations, 2014 as amended.	Describe the portion of the proposed project to which the applicable listed activity relates.
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;**	The proposed roads will be wider than 4m (14m construction phase, rehabilitated to 8m operational phase). The WEF contains CBA 1 and CBA 2 areas as defined in the Northern Cape Critical Biodiversity Areas Technical Report (2016).
12(g)ii.	**The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.** **g. Northern Cape** **ii. Within critical biodiversity areas identified in bioregional plans;**	The WEF will result in the loss of Indigenous vegetation in excess of 300 square metres. The WEF contains CBA 1 and CBA 2 areas as defined in the Northern Cape Critical Biodiversity Areas Technical Report (2016).
14(ii)(a and b)(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;**	This relates to the proposed cabling routes and internal roads which may be constructed within a watercourse. The combined physical footprint at the various watercourse crossings may exceed 10 square metres. The WEF contains CBA 1 and CBA 2 areas as defined in the Northern Cape Critical Biodiversity Areas Technical Report (2016).
18(g)ii.(ee)(ii)	**The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.** **g. Northern Cape**	The proposed roads will be widened by more than 4m and lengthened by more than 1 kilometre in some areas (14m construction phase, rehabilitated to 8m operational phase). The WEF contains CBA 1 and CBA 2

	ii. Outside urban areas: **(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;** **(ii) Areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland**	areas as defined in the Northern Cape Critical Biodiversity Areas Technical Report (2016).

The Applicant, or the EAP on behalf of the Applicant, is initially required to submit a report detailing the Scoping Phase (Scoping Report – this report) and set out the ToR for the EIA Process (Plan of Study for EIA). This is then followed by a report detailing the EIA Phase, the Environmental Impact Report (EIR). The Competent Authority will issue a final decision after their review of the Final EIR.

The Competent Authority that must consider and decide on the application for authorisation in respect of the activities, listed in Table 2-4 above, is the Department of Forestry, Fisheries and the Environment (DFFE) as the Department has reached an agreement with all Provinces that all electricity-related projects, including generation, transmission and distribution, are to be submitted to the National DFFE, irrespective of the legal status of the Applicant. This decision has been made in terms of Section 24(C)(3) of the NEMA (Act No. 107 of 1998 and subsequent amendments).

In addition to the requirements for an Environmental Authorisation (EA) in terms of the NEMA, there may be additional legislative requirements that need to be considered prior to commencing with the activity, these include but are not limited to:

- National Heritage Resources Act (Act No. 25 of 1999);
- National Water Act (Act No. 36 of 1998);
- Civil Aviation Act (Act No. 74 of 1962) as amended;
- National Environmental Management Biodiversity Act (Act No. 10 of 2004);
- National Forests Act (Act No. 84 of 1998); and the

These are discussed in detail in Chapter 4 of this report.

2.4 TECHNICAL: PROPOSED ACTIVITY

2.4.1 WIND ENERGY FACILITY (WEF)

The proposed Taaibos South WEF will consist of up to 36 wind turbines, for a total combined maximum output capacity of up to 270 MW.

Wind energy is a form of solar energy. Winds are caused by the uneven heating of the atmosphere by the sun, the irregularities of the earth's surface, and the rotation of the earth. Wind flow patterns are modified by the earth's terrain, bodies of water, and vegetation. This wind flow or motion energy (kinetic energy) can be used for generating electricity. The term “wind energy” describes the process by which wind is used to generate mechanical power or electricity. Wind turbines convert the kinetic energy in the wind into mechanical power and a generator can then be used to convert this mechanical power into electricity. The components of a typical wind turbine subsystem are depicted by Figure 2-4 below:

- A rotor, or blades, which are the portion of the wind turbine that collect energy from the wind and convert the wind's energy into rotational shaft energy to turn the generator. The speed of rotation of the blades is controlled by the nacelle, which has the ability to turn the blades to face into the wind (‘yaw control’) and change the angle of the blades (‘pitch control’) to make the most use of the available wind. The maximum rotor diameter for the Taaibos South WEF turbines is up to 240 m.

- A nacelle (enclosure) containing a drive train, usually including a gearbox (some turbines do not require a gearbox) and a generator. The generator converts the turning motion of a wind turbine's blades (mechanical energy) into electricity. Inside this component, coils of wire are rotated in a magnetic field to produce electricity. The nacelle is also fitted with brakes, so that the turbine can be switched off during very high winds, such as during storm events. This prevents the turbine from being damaged. All this information is recorded by computers and is transmitted to a control centre, which means that operators don't have to visit the turbine very often, but only occasionally for mechanical monitoring.

- A tower, to support the rotor and drive train the tower, on which a wind turbine is mounted is not only a support structure, but it also raises the wind turbine so that its blades safely clear the ground and can reach the stronger winds at higher elevations. The tower must also be strong enough to support the wind turbine and to sustain vibration, wind loading, and the overall weather elements for the life time of the turbine. The maximum hub height of the Taaibos South WEF turbines is up to 200 m.

- Electronic equipment such as controls, electrical cables, ground support equipment, and interconnection equipment.

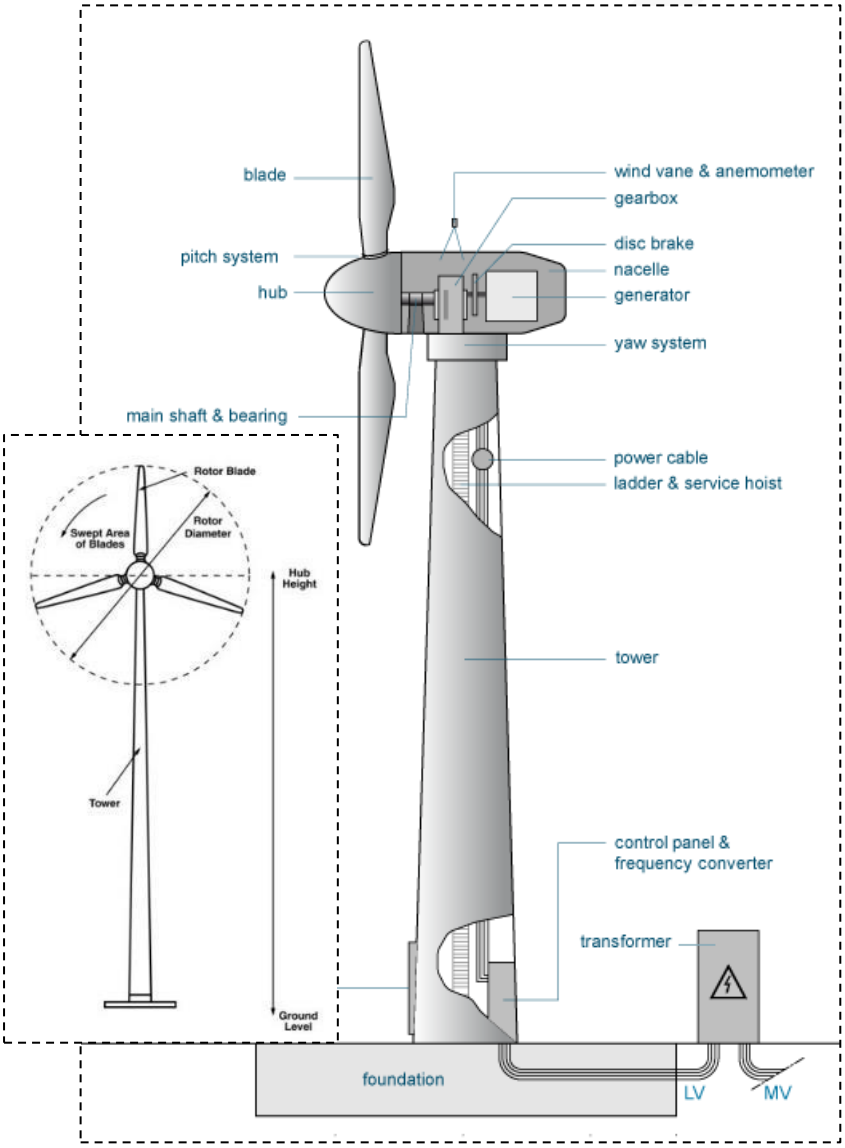

Figure 2-4. Illustrations of the main components of a typical wind turbine. *Note that the transformer would typically be inside the tower (probably at the base). Sources: www.newen.ca and www.soleai.com.

2.4.2 STAGES OF WIND FARM DEVELOPMENT

Typically, building a wind farm is divided into four (4) phases, namely:

- Preliminary civil works;
- Construction;
- Operation; and
- Decommission.

A) PRELIMINARY CIVIL WORKS

Prior to the commencement of the main construction works, the Contractor will undertake vegetation clearance and site establishment works. The site establishment works may include the construction of one, or more, temporary construction compounds and laydown areas and the connection of services such as power and water to these compounds.

B) CONSTRUCTION

The construction footprint will include the platforms, or "crane pads" required to construct the wind turbines, new or upgraded access roads, lay-bys, component storage areas, turning heads and a substation to evacuate the electricity generated to the municipal or national grid.

A typical platform for the assembly of the crane and construction of the turbine is shown in Figure 2-5. These platforms will be connected by access roads with the following requirements:

- Minimum of 8 m width (5 m running width and 1.5 m verge either side) on straight sections with widening required on corners;
- Should a "crawler" type crane be used, then road widths of up to 14 m on straight sections may be required, of which 8 m would be retained for the life of the wind farm;
- Typical 300 mm deep road section;
- Maximum 10% vertical gradient on gravel roads;
- Turning heads provided within 200 m of each crane pad (refer to Figure 2-4); and
- Passing places of c. 50 m length and 5 m width located approximately every 1 km.

The construction footprint required will be greater than the dimensions specified above to allow for construction of the wind farm infrastructure. These areas are used temporarily during the construction period – including temporary construction compound and road verges – and will be rehabilitated at the end of construction works to reduce the footprint on the land.

Other works to be undertaken during the construction phase include:

(a) Geotechnical studies and foundation works

A geotechnical study of the area is undertaken for safety purposes. This comprises of drilling, penetration and pressure assessments. For the purpose of the foundations, approximately 1500 m^3 of soil would need to be excavated for each turbine. These excavations are then filled with steel-reinforced concrete (typically 45 tons of steel reinforcement per turbine including a "bolt ring" to connect the turbine foundation to the turbine tower). Foundation design will vary according to the type and quality of the soil.

(b) Electrical cabling

Electrical and communication cables are laid approximately 1 m deep in trenches which run alongside the access roads as much as possible. All previous farming activities can continue unhindered on the ground above the cables during the operational phase.

(c) Establishment of hard standing surfaces and laydown areas

Laydown and storage areas will be required for the contractor's construction equipment and turbine components on site.

(d) Site preparation

If not carried out in the preliminary works phase, this will include clearance of vegetation over the access roads, platforms, lay-bys, substation and any other laydown or hard-standing areas. These activities will require the stripping of topsoil which will be stock-piled, back-filled and/or spread on site.

(e) Establishment of substation and ancillary infrastructure

The establishment of these facilities/buildings will require the clearing of vegetation and levelling of the development site and the excavation of foundations prior to construction. A laydown area for building materials and equipment associated with these buildings will also be required.

(f) Turbine erection

Weather permitting; the erection of the turbines can be completed swiftly and erection rates generally average 1-2 turbines per week. This phase is the most complex and costly.

(g) Undertake site remediation

Once construction is completed and all construction equipment is removed, the site must be rehabilitated. On full commissioning of the facility, any access points to the site which are not required during the operational phase must be closed and rehabilitated.

(h) Electrical Connection

Each turbine is fitted with its own transformer that steps up the voltage usually to 22 or 33 kV. The entire wind farm is then connected to the "point of interconnection" which is the electrical boundary between the wind farm and the municipal or national grid. Most of these works will be carried out by Eskom or an Eskom-approved sub-contractor (line upgrade, connection to the sub-station, burial of the cables etc.)

C) OPERATIONAL PHASE

During the period when the turbines are up and running, on-site human activity drops to a minimum, and includes routine maintenance requiring only light vehicles to access the site. Only major breakdowns would necessitate the use of cranes and trucks.

(a) Facility re-powering

The Wind turbines are expected to have a lifespan of approximately 20 years (with appropriate maintenance). The infrastructure would only be decommissioned once it has reached the end of its economic or technological life. If economically feasible, the disassembly and replacement of the individual components with more appropriate technology/infrastructure available at the time will take place.

D) DECOMMISSIONING OF THE WIND FARM

The infrastructure would only be decommissioned once it has reached the end of its economic or technological life. If economically feasible, the decommissioning activities would comprise the disassembly and replacement of the individual components with more appropriate technology/infrastructure available at the time. This operation is referred to as 'facility re-powering'. However, if not deemed so, then the facility would be completely decommissioned which would include the following decommissioning activities.

(a) Site preparation

Activities would include confirming the integrity of the access to the site to accommodate the required equipment and the mobilisation of decommissioning equipment.

(b) Disassemble all individual components

The components would be disassembled and reused and recycled or disposed of in accordance with regulatory requirements.

3 PROJECT NEED AND DESIRABILITY

3.1 BACKGROUND

The current section has taken note of the revised Guideline on Need and Desirability in terms of the Environmental Impact Assessment (EIA) Regulations, 2014. DFFE Integrated Environmental Management Guidelines Series 9. 2017.

When considering an application for Environmental Authorisation (EA), the competent authority must comply with section 24O of the National Environmental Management Act, No 107 of 1998 (NEMA), and must have regard for any guideline published in terms of section 24J of the Act and any minimum information requirements for the application. This includes this need and desirability guideline.

Additionally, the Environmental Impact Assessment (EIA) regulations require environmental assessment practitioners (EAPs) who undertake environmental assessments, to have knowledge and take into account relevant guidelines. A person applying for an EA must abide by the regulations, which are binding on the applicant.

The guideline contains information on best practice and how to meet the peremptory requirements prescribed by the legislation and sets out both the strategic and statutory context for the consideration of the need and desirability of a development involving any one of the NEMA listed activities. Need and desirability is based on the principle of sustainability, set out in the Constitution and in NEMA, and provided for in various policies and plans, including the National Development Plan 2030 (NDP). Addressing the need and desirability of a development is a way of ensuring sustainable development – in other words, that a development is ecologically sustainable and socially and economically justifiable – and ensuring the simultaneous achievement of the triple bottom-line.

The Guideline sets out a list of questions which should be addressed when considering need and desirability of a proposed development. These are divided into questions that relate to ecological sustainability and justifiable economic and social development. The questions that relate to ecological sustainability include how the development may impact ecosystems and biological diversity; pollution; and renewable and non-renewable resources. When considering how the development may affect or promote justifiable economic and social development, the relevant spatial plans must be considered, including Municipal Integrated Development Plans (IDP), Spatial Development Frameworks (SDF) and Environmental Management Frameworks (EMF). The assessment reports will need to provide information as to how the development will address the socio-economic impacts of the development, and whether any socio-economic impact resulting from the development impact on people's environmental rights. Considering the need and desirability of a development entails the balancing of these factors.

Sustainable development refers to the integrated relationship between social, economic and environmental factors in planning, implementation and decision-making so as to ensure that development serves present and future generations (National Sustainable Development Framework). Sustainable development is a programme to change the process of economic development so that it ensures a basic quality of life for all people and protects the ecosystems and community systems that make life possible and worthwhile.

3.2 CURRENT CONTEXT

Increasing pressure is being placed on countries internationally to reduce their reliance on fossil fuels, such as oil and coal, which contribute towards greenhouse gases (GHG) being emitted into the atmosphere and

thus contributing to global climate change. Renewable energy resources such as wind energy facilities and solar PV farms are being implemented as alternative sources of energy at a global and national scale.

South Africa has recognised the need to expand electricity generation capacity within the country. This is based on national policy and informed by ongoing planning undertaken by the Department of Energy (DoE) and the National Energy Regulator of South Africa (NERSA).

The draft of the South African Integrated Resource Plan (IRP 2018) was released for public comment in August 2018, setting out a new direction in energy sector planning. The plan included a shift away from coal, increased adoption of renewables and gas, and an end to the expansion of nuclear power. The revised plan marks a major shift in energy policy. The draft policy aimed to decommission a total of 35 GW (of 42 GW currently operating) of coal generation capacity from Eskom by 2050, starting with 12 GW by 2030, 16 GW by 2040 and a further 7 GW by 2050.

The IRP 2019 was Gazetted in October 2019 and makes provision for the procurement of 1.6 GW of wind energy per annum from 2020 to 2030.

The implementation of the IRP constitutes significant progress in the transformation of the South African energy sector. To be in line with the Paris Agreement goals for mitigation, South Africa would still need to adopt more ambitious actions by 2050 such as expanding renewable energy capacity beyond 2030, fully phasing out coal by mid-century, and substantially limiting unabated natural gas use.

3.3 ELECTRICITY SUPPLY IN SOUTH AFRICA

South Africa's current electricity generation and supply system is unreliable. Currently, Eskom has a net output of 47,201MWp, and it produces 85% of South Africa's electricity, which is an equivalent of 40% of Africa's electricity. Renewable energy accounts for 5% of South Africa's electricity. This is mainly due to the targets set in the IRP2010-2030 that aimed to change the electricity landscape from high coal (91.7%) to medium coal (48%) using electricity produced by the Independent Power Producers, with the utility company, Eskom, as the single buyer of the electricity.

South Africa has a high level of renewable energy potential and presently has in place a target of 17 800 MW of renewable energy. The REIPPP Programme has been designed to contribute towards the national target and towards socio-economic and environmentally sustainable growth, and to start and stimulate the renewable industry in South Africa.

In terms of the REIPPPP, bidders will be required to bid on tariff and the identified socio-economic development objectives of the DoE. The tariff will be payable by the Buyer (currently ESKOM) pursuant to the Power Purchase Agreement (PPA) to be entered into between the Buyer and the Project Company of a Preferred Bidder. Please see section 6.3.8 for more information regarding the REIPPPP.

The Sixth (6th) Bid Window, under the REIPPPP, was concluded in December 2022. Eskom listed grid constraints as a limiting factor to certain areas within South Africa and as such no wind energy was awarded preferred bidder status during Round 6.

This procurement bid window is the second to be released in line with the Ministerial Determination, promulgated on 25th September 2020, which seeks to procure 11 813 MW of power from various sources including renewable energy, storage, gas and coal.

The RFP calls for proposals from Independent Power Producers (IPPs) to develop new generation capacity of 2 600 MW, including 1 600 MW from onshore wind energy and 1 000 MW from Solar Photovoltaic (Solar PV) power plants.

This 6th Bid Window has been designed to contribute towards socio-economic and environmentally sustainable growth, to continue the successes of the REIPPPP since its inception, and to further stimulate increased local participation and economic empowerment in the South African Renewable Energy industry.

3.4 Social and Economic Development

Taaibos South WEF intends to promote local economic growth and development through direct and indirect employment, as well as the identification and implementation of social development schemes during the project's operational phase. A local community trust will be established in order to ensure that funds are channelled to these social development schemes.

The need and desirability of the proposed Taaibos South WEF project can be demonstrated in the following main areas:

- Move to green energy due to growing concerns associated with climate change and the on-going exploitation of non-renewable resources;
- Security of electricity supply, where over the last few years, South Africa has been adversely impacted by interruptions in the supply of electricity; and
- Stimulation of the green economy where there is a high potential for new business opportunities and job creation.

The above main drivers, for renewable energy projects, are supported by the following International, National and Provincial (Northern Cape Province) policy documents.

3.5 International

3.5.1 The 1992 United Nations Framework Convention on Climate Change (UNFCCC)

The UNFCCC is a framework convention which was adopted at the 1992 Rio Earth Summit. South Africa signed the UNFCCC in 1993 and ratified it in August 1997. The stated purpose of the UNFCCC is to, "achieve… stabilisation of greenhouse gas concentrations in the atmosphere at concentrations at a level that would prevent dangerous anthropogenic interference with the climate system", and to thereby prevent human-induced climate change by reducing the production of greenhouse gases defined as, "those gaseous constituents of the atmosphere both natural and anthropogenic, that absorb and re-emit infrared radiation".

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

The UNFCCC is relevant in that the proposed Taaibos South WEF project will contribute to a reduction in the production of greenhouse gases by providing an alternative to fossil fuel-derived electricity. South Africa has committed to reducing emissions to demonstrate its commitment to meeting international obligations.

3.5.2 THE KYOTO PROTOCOL (2002)

The Kyoto Protocol is a protocol to the UNFCCC which was initially adopted for use on the 11th of December 1997 in Kyoto, Japan, and which entered into force on the 16th of February 2005 (UNFCCC, 2009). The Kyoto Protocol is the chief instrument for tackling climate change. The major feature of the Protocol is that it sets binding targets for 37 industrialized countries and the European community for reducing greenhouse gas (GHG) emissions. This amounts to an average of 5% against 1990 levels over the five-year period 2008-2011. The major distinction between the Protocol and the Convention is that, "while the Convention encouraged industrialised countries to stabilize GHG emissions, the Protocol commits them to do so".

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

The Kyoto Protocol is relevant in that the proposed Taaibos South WEF project will contribute to a reduction in the production of greenhouse gases by providing an alternative to fossil fuel-derived electricity and will assist South Africa to begin demonstrating its commitment to meeting international obligations in terms of reducing its emissions.

3.6 NATIONAL

3.6.1 NATIONAL DEVELOPMENT PLAN (2011)

The National Development Plan (NDP) (also referred to as Vision 2030) is a detailed plan produced by the National Planning Commission in 2011 that is aimed at reducing and eliminating poverty in South Africa by 2030. The NDP represents a new approach by Government to promote sustainable and inclusive development in South Africa, promoting a decent standard of living for all, and includes twelve (12) key focus areas, those relevant to the current proposed WEF being:

- An economy that will create more jobs.
- Improving infrastructure.
- Transition to a low carbon economy.

SECTOR	TARGET
Electrical infrastructure	• South Africa needs an additional 29,000 MW of electricity by 2030. About 10,900 MW of existing capacity will be retired, implying new build of about 40,000 MW. • About 20,000 MW of this capacity should come from renewable sources.
Transition to a low carbon economy	• Achieve the peak, plateau and decline greenhouse gas emissions trajectory by 2025. • About 20,000 MW of renewable energy capacity should be constructed by 2030.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

The proposed Taaibos South WEF will contribute towards additional energy capacity in South Africa and will contribute towards a reduction in greenhouse gas emissions.

3.6.2 NATIONAL CLIMATE CHANGE RESPONSE WHITE PAPER (2012)

The White Paper indicates that Government regards climate change as one of the greatest threats to sustainable development in South Africa and commits the country to making a fair contribution to the global effort to achieve the stabilisation of greenhouse gas concentrations in the atmosphere at a level that prevents dangerous anthropogenic interference with the climate system.

The White Paper also identifies various strategies in order to achieve its climate change response objectives, including:

- The prioritisation of mitigation interventions that significantly contribute to an eventual decline emission trajectory from 2036 onwards, in particular, interventions within the energy, transport and industrial sectors.
- The prioritisation of mitigation interventions that have potential positive job creation, poverty alleviation and/or general economic impacts. In particular, interventions that stimulate new industrial activities and those that improve the efficiency and competitive advantage of existing business and industry.

The White Paper provides numerous specific actions for various Key Mitigation Sectors including renewable energy. The following selected strategies (amongst others) must be implemented by South Africa in order to achieve its climate change response objectives:

- The prioritisation of mitigation interventions that significantly contribute to a peak, plateau and decline emission trajectory where greenhouse gas emissions peak in 2020 to 2025 at 34% and 42% respectively below a business as usual baseline, plateau to 2035 and begin declining in absolute terms from 2036 onwards, in particular, interventions within the energy, transport and industrial sectors.
- The prioritisation of mitigation interventions that have potential positive job creation, poverty alleviation and/or general economic impacts. In particular, interventions that stimulate new industrial activities and those that improve the efficiency and competitive advantage of existing business and industry.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

The proposed Taaibos South WEF project will provide an alternative to fossil fuel-derived electricity and will contribute to climate change mitigation.

3.6.3 White Paper on Renewable Energy Policy (2003)

The White Paper on the Renewable Energy Policy (2003) commits the South African Government support for the development, demonstration and implementation of renewable energy sources for both small and large scale applications. It sets out the policy principles, goals and objectives to achieve, “An energy economy in which modern renewable energy increases its share of energy consumed and provides affordable access to energy throughout South Africa, thus contributing to sustainable development and environmental conservation”.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

The proposed Taaibos South WEF is consistent with the White Paper and the objectives therein to develop an economy in which renewable energy has a significant market share and provides affordable access to energy throughout South Africa, thus contributing to sustainable development and environmental conservation.

3.6.4 Integrated Energy Plan for the Republic of South Africa (2003)

The former Department of Minerals and Energy (DME) commissioned the Integrated Energy Plan (IEP) in response to the requirements of the National Energy Policy in order to provide a framework by which specific energy policies, development decisions and energy supply trade-offs could be made on a project-by-project basis. The framework is intended to create a balance between energy demand and resource availability so as to provide low-cost electricity for social and economic development, while taking into account health, safety and environmental parameters.

In addition to the above, the IEP recognised the following:-

- South Africa is likely to be reliant on coal for at least the next 20 years as the predominant source of energy.
- New electricity generation will remain predominantly coal based but with the potential for hydro, natural gas, renewables and nuclear capacity.
- Need to diversify energy supply through increased use of natural gas and new and renewable energies.
- The promotion of the use of energy efficiency management and technologies.
- The need to ensure environmental considerations in energy supply, transformation and end use.

- The promotion of universal access to clean and affordable energy, with the emphasis on household energy supply being coordinated with provincial and local integrated development programme.
- The need to introduce policy, legislation and regulations for the promotion of renewable energy and energy efficiency measures and mandatory provision of energy data.
- The need to undertake integrated energy planning on an on-going basis.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

The Taaibos South WEF is in line with the IEP with regards to diversification of energy supply and the promotion of universal access to clean energy.

3.6.5 Integrated Resource Plan for Electricity 2010-2030 (Revision 2, 2011)

The Integrated Resource Plan (IRP, 2010) for South Africa was initiated by the DoE and lays the foundation for the country's energy mix up to 2030, and seeks to find an appropriate balance between the expectations of different stakeholders considering a number of key constraints and risks, including:

- Reducing carbon emissions.
- New technology uncertainties such as costs, operability and lead time to build.
- Water usage.
- Localisation and job creation.
- Southern African regional development and integration.
- Security of supply.

The Policy-Adjusted IRP includes recent developments with respect to prices and allocates 17 800 MW for renewables, of the total 42 600 GW (including both renewables and non-renewables) new-build up to 2030 allocated as follows:

- Wind at 8 400 MW.
- Concentrated solar power at 1 000 MW.
- Photovoltaic at 8 400 MW.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

The Taaibos South WEF is in line with the IRP for electricity and will contribute towards finding an appropriate balance between the various stakeholders as per the IRP2011.

3.6.6 Integrated Resource Plan for Electricity 2010-2030 (Revision 3, 2019)

The Integrated Resource Plan (IRP, 2019) for South Africa was initiated by the DoE and lays the foundation for the country's energy mix up to 2030, and seeks to find an appropriate balance between the expectations of different stakeholders considering a number of key constraints and risks, including:

- Reducing carbon emissions;
- New technology uncertainties such as costs, operability and lead time to build;
- Water usage;
- Localisation and job creation;
- Southern African regional development and integration; and
- Security of supply.

The IRP is an electricity infrastructure development plan based on the least-cost electricity supply and demand balance, taking into account security of supply and the environment through the minimisation of negative emission and water use. It is important because it is South Africa's plan for the procurement of generation capacity up to 2030. The last such plan was the Integrated Resource Plan 2010 (IRP 2010) promulgated in March 2011, and such plans are intended to be updated every two years.

Since the promulgation of IRP 2010, a total of 18 000 MW of new generation capacity has been committed comprising 9,564 MW of coal power at Medupi and Kusile, 1,332 MW of water pumped storage at Ingula, 6,422 MW of renewable energy by independent power producers (IPPs), and 1,005 MW of Open Cycle Gas Turbine (OCGT) peaking plants currently using diesel at Avon and Dedisa.

6,000 MW of new solar PV capacity and 14,400 MW of new wind power capacity will be commissioned by 2030 under IRP 2019. The current annual build limits on solar PV and wind have been retained pending a report on the just transition strategy. There will be no new concentrated solar power commissioned under IRP 2019 up to 2030 beyond the 300 MW already committed to being commissioned in 2019. The following image outlines the steps taken between the last IRP Revision (2011) and the latest IRP Revision (2019). As per the CSIR summary (Online: https://researchspace.csir.co.za/)

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

The proposed Taaibos South WEF is in line with the draft IRP 2019 with respect to the energy mix and movement to a low carbon economy up to 2030 and beyond.

3.6.7 Draft Integrated Resource Plan (2018)

The 2011 version of the IRP is currently under review with a draft version having been put out for comment in August 2018.

The draft IRP 2018 is essentially a plan for South Africa's future energy needs but also attempts to balance a number of objectives, including: security of supply, at minimal cost, with minimal environmental impacts (including CO_2 emission reduction targets) and minimal water usage.

Drawing from the conclusions of the scenarios analysed, the scenario of RE without annual build limits provides the least-cost path up to 2050. The significant change in the energy mix post 2030 and the sensitivity of the energy mix to the assumptions are key points to note.

It is therefore recommended that the post 2030 path not be confirmed, but that detailed studies be undertaken to inform the future update of the IRP. These studies should, among others, include the following:

- Detailed analysis of the appropriate level of penetration of RE in the South African national grid to better understand the technical risks and mitigations required to ensure security of supply is maintained during the transition to a low-carbon future.

For the period ending 2030, a number of policy adjustments are proposed to ensure a practical plan that will be flexible to accommodate new, innovative technologies that are not currently cost competitive, the minimization of the impact of decommissioning of coal power plants and the changing demand profile.

Applied policy adjustment and considerations in the final proposed plan includes the following:

- A least-cost plan with the retention of annual build limits (1 000 MW for PV and 1 600 MW for wind) for the period up to 2030. This provides for smooth roll out of RE, which will help sustain the industry.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

The proposed Taaibos South WEF is in line with the draft IRP 2018 with respect to the energy mix and movement to a low carbon economy up to 2030 and beyond.

3.6.8 Renewable Energy Independent Power Producer Procurement Programme (REIPPPP)

South Africa has a high level of renewable energy potential and presently has in place a target of 17 800 MW

of renewable energy. The REIPPP Programme has been designed so as to contribute towards the national target and towards socio-economic and environmentally sustainable growth, and to start and stimulate the renewable industry in South Africa.

In terms of the REIPPPP, bidders will be required to bid on tariff and the identified socio-economic development objectives of the DoE. The tariff will be payable by the Buyer (currently ESKOM) pursuant to the Power Purchase Agreement (PPA) to be entered into between the Buyer and the Project Company of a Preferred Bidder.

The following table summarises the REIPPPP bidding windows which have already been completed.

Bidding Window 1	Bidding Window 2	Bidding Window 3	Bidding Window 3.5	Bidding Window 4	Bidding Window 5
• Submission Date: 04/11/2011 • 28 Preferred Bidders • 1 425 MW of contracted capacity	• Submission Date: 05/03/2012 • 19 Preferred Bidders • 1 040 MW of contracted capacity	• Submission Date: 19/08/2013 • 17 Preferred Bidders • 1 457 MW of contracted capacity	• Submission Date: 31/04/2014 • 2 Preferred Bidders • 200 MW of contracted capacity	• Submission Date: 18/08/2014 • 26 Preferred Bidders • 2 205 MW of contracted capacity	• Submission Date: 28/10/2021 • 25 Preferred Bidders • 2 205 MW of contracted capacity

The Sixth (6th) Bid Window, under the REIPPPP, was concluded in December 2022. Eskom listed grid constraints as a limiting factor to certain areas within South Africa and as such no wind energy was awarded preferred bidder status during Round 6.

This procurement bid window is the second to be released in line with the Ministerial Determination, promulgated on 25th September 2020, which seeks to procure 11 813 MW of power from various sources including renewable energy, storage, gas and coal.

The RFP calls for proposals from Independent Power Producers (IPPs) to develop new generation capacity of 2 600 MW, including 1 600 MW from onshore wind energy and 1 000 MW from Solar Photovoltaic (Solar PV) power plants.

This 6th Bid Window has been designed to contribute towards socio-economic and environmentally sustainable growth, to continue the successes of the REIPPPP since its inception, and to further stimulate increased local participation and economic empowerment in the South African Renewable Energy industry.

Given the energy challenges the country is facing the qualification criteria has been developed to promote the participation of projects that are fully developed and will be able to be constructed and connected to the national grid as soon as possible, but not later than 24 months post Commercial Close.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

In terms of REIPPPP, bids would be awarded for renewable energy supply to Eskom through up to 6 bidding phases. The 1st, 2nd, 3rd, 4th and 5th round bidding processes have been completed where projects are currently reaching financial close in order to implement the projects. REIPPPP is currently entering the 6th bidding window.

3.6.9 Long Term Mitigation Scenarios (2007)

The aim of the Long-Term Mitigation Scenarios (LTMS) was to set the pathway for South Africa's long-term climate policy and will eventually inform a legislative, regulatory and fiscal package that will give effect to the policy package at a mandatory level. The overall goal is to "develop a plan of action which is economically risk-averse and internationally aligned to the world effort on climate change."

The strategy assesses various response scenarios but concludes that the only sustainable option ("the preferred option") for South Africa is the "Required by Science" scenario where the emissions reduction targets should target a band of between -30% to -40% emission reductions from 2003 levels by 2050 which includes increasing renewable energy in the energy mix by 50% by 2050.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

The proposed Taaibos South WEF will contribute towards an overall reduction in emissions and aligns with the world stance on efforts towards the mitigation of climate change.

3.6.10 INDUSTRIAL POLICY ACTION PLAN 2011/12 – 2013/14

The South African Industrial Policy Action Plan (IPAP 2) 2011/12 – 2013/14 represents a further step in the evolution of this work and serves as an integral component of government's New Growth Path and notes that there are significant opportunities to develop new 'green' and energy-efficient industries and related services; and indicates that in 2007/2008, the global market value of the 'Low-Carbon Green Sector' was estimated at £3 trillion (or nearly US$5 trillion), a figure that is expected to rise significantly in the light of climate-change imperatives, energy and water security imperatives.

Based on economic, social and ecological criteria, IPAP identified a number of sub-sectors and an initial round of concrete measures were proposed for development of the renewable energy sector with the following key action programmes:

- Solar and Wind Energy - Stimulate demand to create significant investment in renewable energy supply and the manufacturing of local content for this supply.
- Green Industries special focus: The South African Renewables Initiative (SARi) - SARi is an intra-governmental initiative set to catalyse industrial and economic benefits from an ambitious program of renewables development; including financing and associated institutional arrangements that would not impose an unacceptable burden on South Africa's economy, public finances or citizens.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

The proposed Taaibos South WEF will contribute towards an overall reduction in emissions and it aligns with the world stance on efforts towards the mitigation of climate change.

3.6.11 STRATEGIC INFRASTRUCTURE PROJECTS (2012)

The National Infrastructure Plan that was adopted in 2012 together with the New Growth Path, which sets a goal of five million new jobs by 2020, identifies structural problems in the economy and points to opportunities in specific sectors and markets or "jobs drivers" resulted in the establishment of the Presidential Infrastructure Coordinating Committee (PICC) which in turn resulted in the development of 18 Strategic Infrastructure Projects (SIPS).

SIPS relevant to renewable energy include:

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

- Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP2010).

SIP 9: Electricity generation to support socio-economic development

- Accelerate the construction of new electricity generation capacity in accordance with the IRP2010 to meet the needs of the economy and address historical imbalances.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

The Taaibos South WEF will contribute to SIP project role out.

3.7 PROVINCIAL

3.7.1 NORTHERN CAPE PROVINCIAL GROWTH AND DEVELOPMENT STRATEGY

The Northern Provincial Growth and Development Strategy (2019) (NCPGPS) aims to place the Northern Cape Province on a new development trajectory of sustainable development which forms part of its long-term strategic approach. The strategy is based on the 2015 Sustainable Development Goals (SDGs'), which is the blueprint for global development in order to achieve a better and more sustainable future for all. The NCPGDS recognises that social wellbeing is a complex concept, and refers to several aspects relating to human life, such as happiness, material fulfilment and personal needs. Although many aspects of social well-being can only be achieved by an individual and their subjective feelings and experiences, access to basic infrastructure and economic opportunities acts as a catalyst for achieving various levels of human well-being.

In terms of the Economy, the Northern Cape is perfectly placed to be at the forefront of another industrial revolution. The Strategy points out that the Provinces vast resources including sun, wind, open spaces, ocean, the various minerals and semi-precious stones, amongst others provides the province with competitive and comparative advantages. Environmental sustainability can only be achieved if the province's environmental assets and natural resources are protected and enhanced. The Northern Cape Province is endowed with rich natural resources and mineral deposits which offers the opportunity to fund the transition to a low-carbon future and a more diverse and inclusive green economy if used responsibly.

Furthermore, the Northern Cape Province Strategic Plan 2020-2025 references the need to ensure the availability of inexpensive energy as a means to promote economic growth in the Northern Cape. The availability of electricity to key industrial users at critical localities at competitive rates will ensure the competitiveness of these industries. At the same time, the development of new sources of energy through the promotion of the adoption of energy applications that display synergy with the province's natural resource endowments must be encouraged. The report further states that the development of energy sources such as wind energy, the natural gas fields, bio-fuels, etc., could be some of the means by which new economic opportunity and activity is generated in the Northern Cape. This also highlights the importance of close co-operation between public and private sectors in order for the economic development potential of the Northern Cape to be realised.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

The proposed Taaibos South WEF is in line with the Northern Cape Provincial Development Plan as it entails the development of a wind farm which could potentially contribute up to 270 MW of electricity to the Eskom Grid.

3.7.2 PIXLEY KA SEME DISTRICT MUNICIPALITY INTEGRATED DEVELOPMENT PLAN

The Vision for the District Municipality as presented in the Integrated Development Plan (IDP) is "Sustainably Developed District for future Generations". Along with the following Strategic goals:

- Supporting of local municipalities to create a home for all individuals in the towns, settlements and
- rural areas to render dedicated services;
- Providing political and administrative leadership and direction in the development planning process;
- Promoting economic growth that is shared across and within communities;
- Promoting and enhancing integrated development planning in the operations of all local municipalities; Aligning development initiatives in the district to the National Development Plan.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

The proposed Taaibos South WEF is in line with the Pixley Ka Seme IDP in that the SWOT analysis undertaken identified solar and wind farms as potential opportunities.

3.7.3 Ubuntu Local Municipality Integrated Development Plan

The Ubuntu Local Municipality Integrated Development Plan 2021/2022 aims to be a blueprint for the future development trajectory of the municipality. One of the many challenges identified is to ensure that all citizens have access to basic services such as water, sanitation, electricity, and housing. In this regard, electricity infrastructure development is a key component of the municipality's strategic objective for the provision of sustainable basic services. The establishment of additional electrical infrastructure, such as the proposed Taaibos South WEF is an important stepping-stone in achieving the desired goals. One of the strengths identified within the LM is the availability of land and the resulting opportunity to utilise this land for renewable energy projects.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

The proposed Taaibos South WEF would contribute to the identified economic development within the LM and is in line with the development trajectory as described within the IDP.

3.8 Site Selection: Wind Capability

In order to determine the wind resource potential of a proposed WEF site, it is necessary to erect a wind measurement mast to gather wind speed data and correlate these measurements with other meteorological data. A measurement campaign of at least 12 months in duration is necessary to ensure verifiable data is obtained. This data has advised on the economics of the project and finalise the positions of the wind turbines. The masts were marked as per the requirements of the Civil Aviation Authority (CAA).

3.9 Renewable Energy Development Zones

On the 17th of February 2016, the Cabinet of the Republic of South Africa (Cabinet) approved the gazetting of Renewable Energy Development Zones (REDZs).

REDZs refer to geographical areas where wind and solar PV development can occur in concentrated zones, which will lead to:

- a reduction of negative environmental consequences;
- alignment of authorisation and approval processes;
- attractive incentives; and
- focused expansion of the South African electricity grid.

Cabinet further stated that the REDZs will, among others, accelerate infrastructure development and contribute in creating a "predictable regulatory framework that reduces bureaucracy related to the cost of compliance".

The DEA's media statement issued in respect of the approved gazetting of the REDZs provided that in Phase 1 8 REDZs and 5 Power Corridors were identified. The REDZs are located in Overberg (Western Cape), Komsberg (Western Cape), Cookhouse (Eastern Cape), Stormberg (Eastern Cape), Kimberley (Free State/Northern Cape), Vryburg (North West), Upington (Northern Cape) and Springbok (Northern Cape). Phase 2 saw the addition of 3 additional REDZ which are located in Emalahleni (Mpumalanga), Klerksdorp (Free State / North West) and Beaufort West (Western Cape).

The 5 Power Corridors are planned as follows: The central corridor runs for the first time from the south of

the country to the north. Two corridors run along the east and west coasts, while the fourth and fifth include interconnections with Botswana, Namibia and Zimbabwe to accommodate current and forecasted imports and exports of electricity. Eskom estimates that the thousands of kilometres of transmission lines and infrastructure needed to create these corridors of power will take eight years to construct and cost approximately R213bn.

The proposed Taaibos South WEF falls just to the North of the Beaufort West zone. The site does however fall within the Central Corridor.

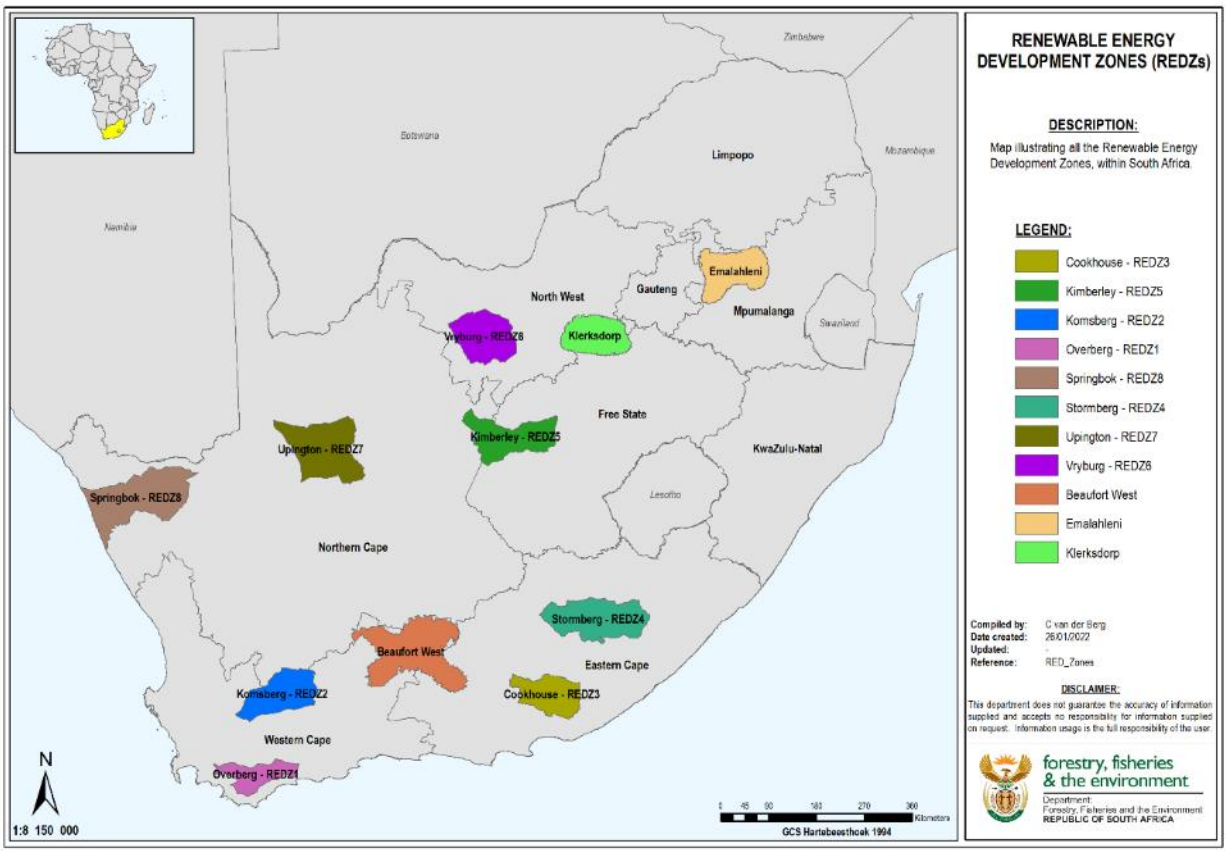

Figure 3-1: DFFE Renewable Energy Development Zones (REDZ).

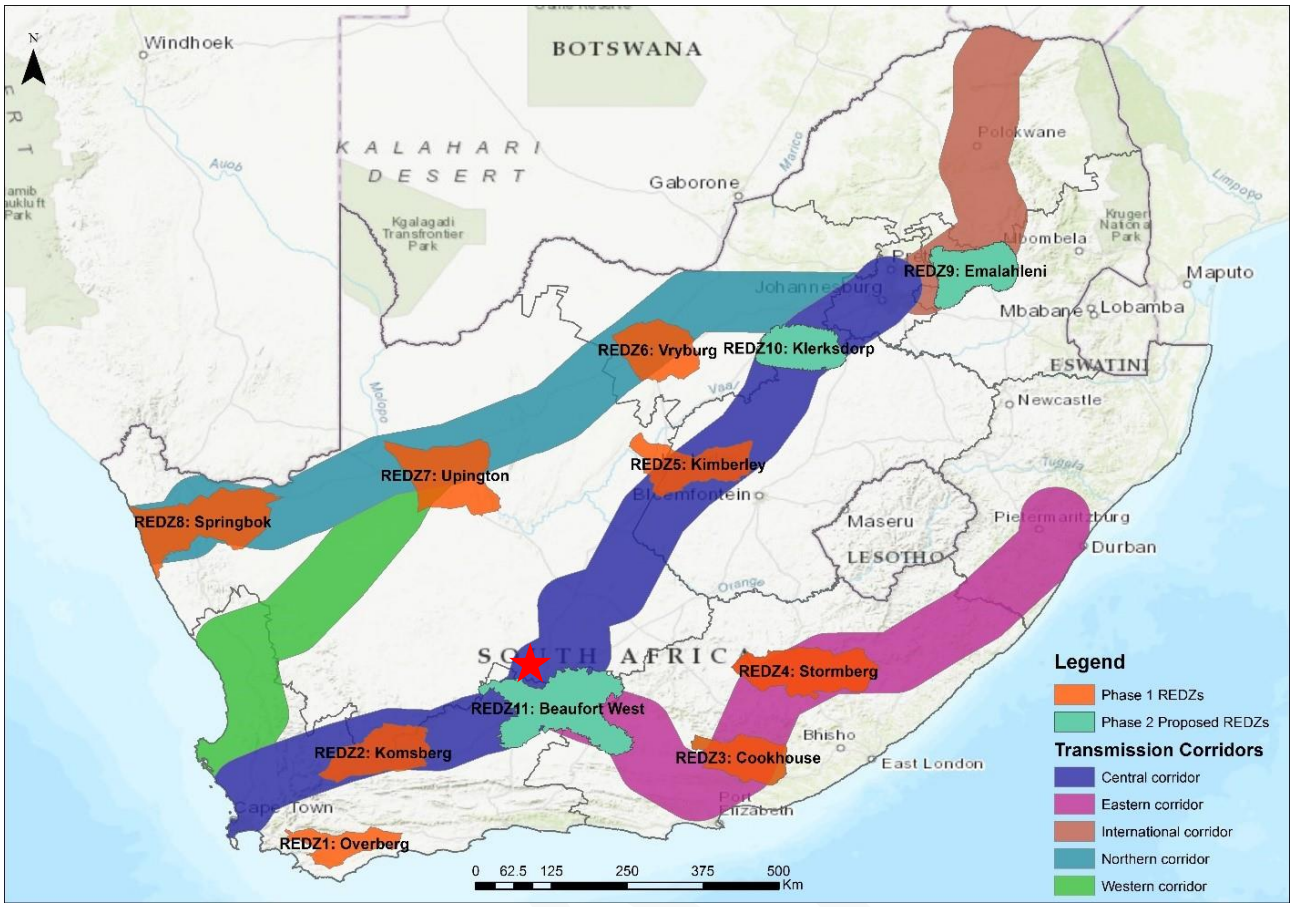

Figure 3-2: DFFE Strategic Transmission Corridors (the site is situated in the central transmission corridor).

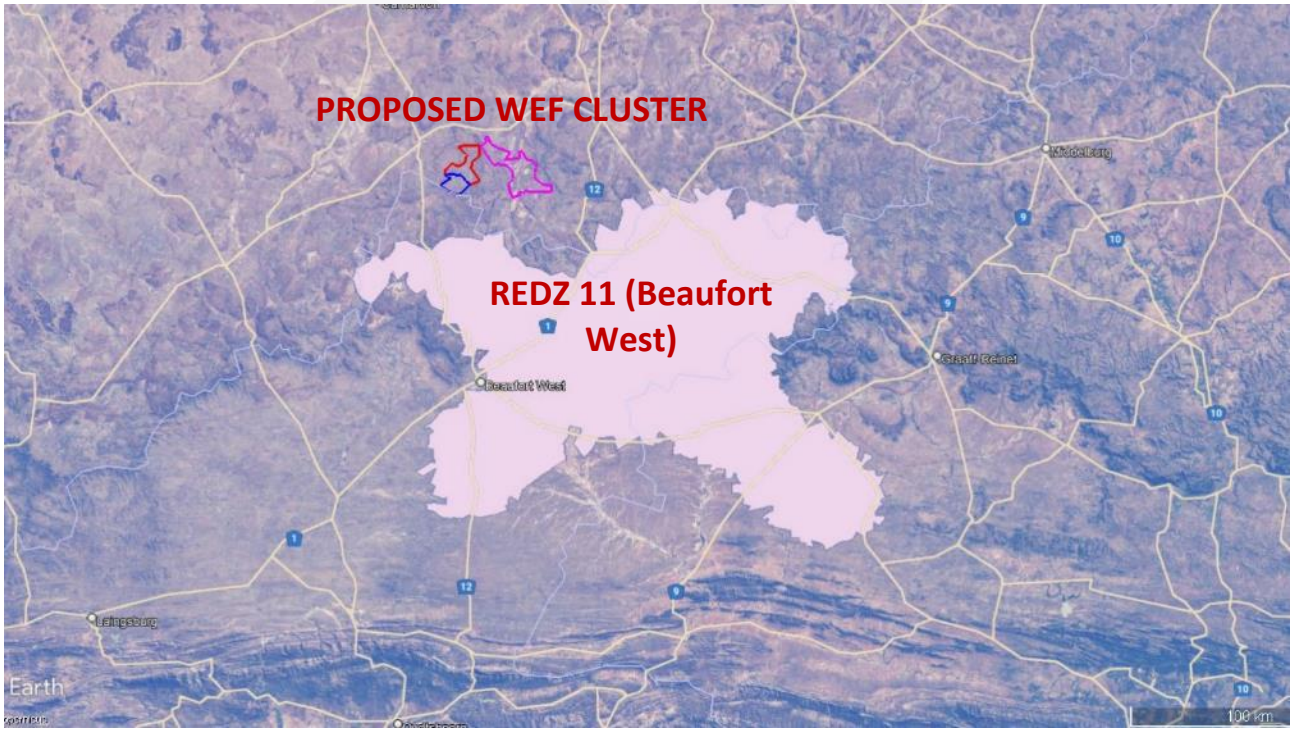

Figure 3-3: Proposed WEF locations in relation to the closest REDZ (Beaufort West).

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

Although the proposed Taaibos South WEF does not occur within a REDZ area, it is situated within the central transmission corridor.

3.10 BIODIVERSITY CONSERVATION PROGRAMMES

The proposed Taaibos South WEF occurs within or is within close proximity to various important conservation areas as described below.

3.10.1 NATIONAL VEGETATION MAP (SANBI)

As indicated in the baseline ecological assessment at Section 5 of this Scoping Report, according to SANBI's National Vegetation Map (2018), the proposed WEF occurs within one (1) vegetation type, namely Eastern Upper Karoo (least threatened) (Figure 3-4).

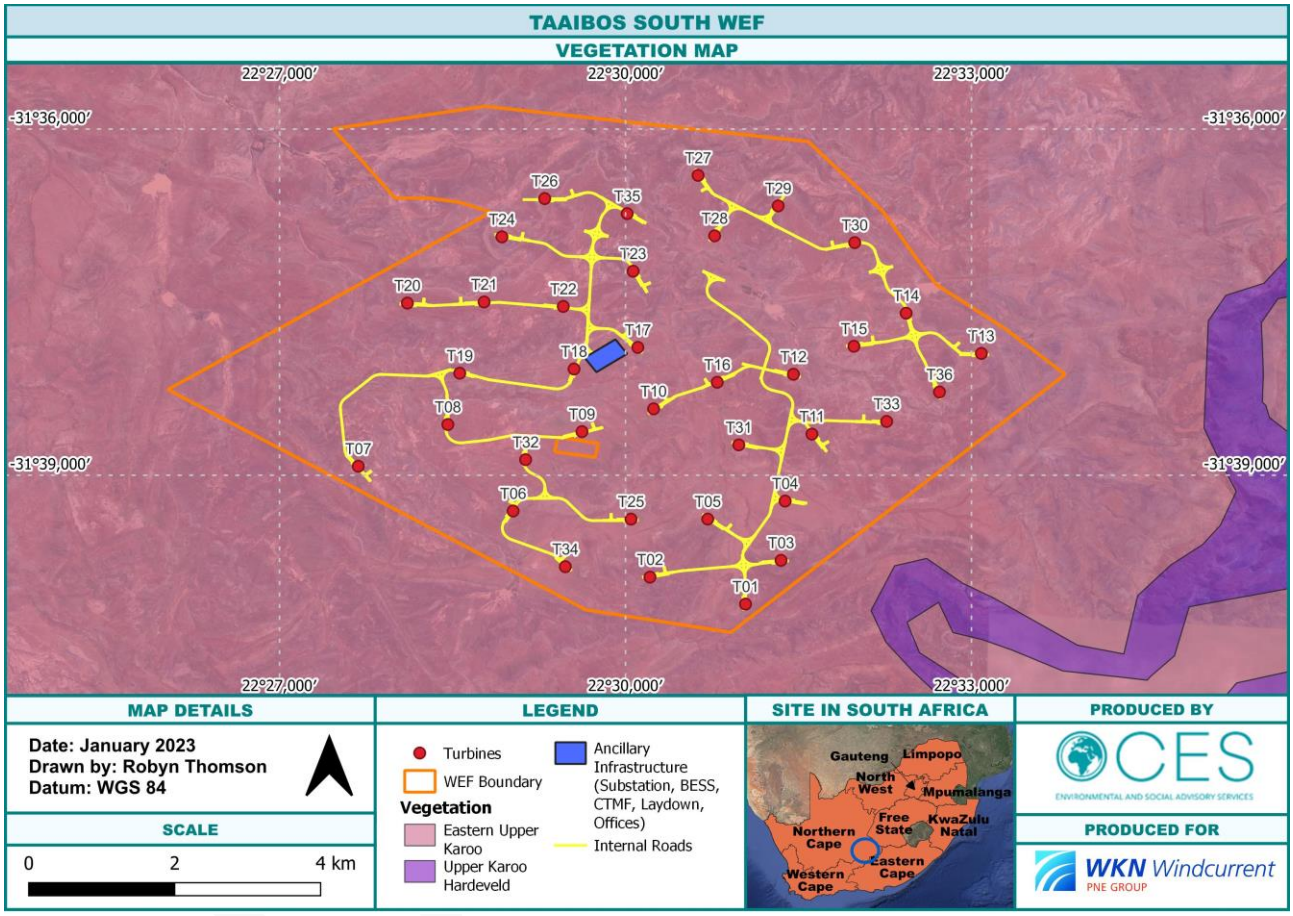

Figure 3-4: National Vegetation Map for the proposed Taaibos South WEF site area.

3.10.2 CRITICAL BIODIVERSITY AREAS

As indicated in the baseline ecological assessment at Section 5 of this Scoping Report, most of site area is designated unclassified, with a small patch designated CBA 1 on the western side, a small patch designated an ESA on the western side, and a small patch designated CBA2 on the northern side. Development of CBA 1 area should be avoided as far as possible. It is likely that development within CBA 1 and 2 cannot be avoided. Respective authorities may require consideration of Biodiversity Offsets. It must be noted that, as per the Ecological Impact Assessment (Appendix E5), wildlife corridors can be maintained in the areas around the proposed WEF turbine footprints. This has also been factored into the road and ancillary infrastructure locations.

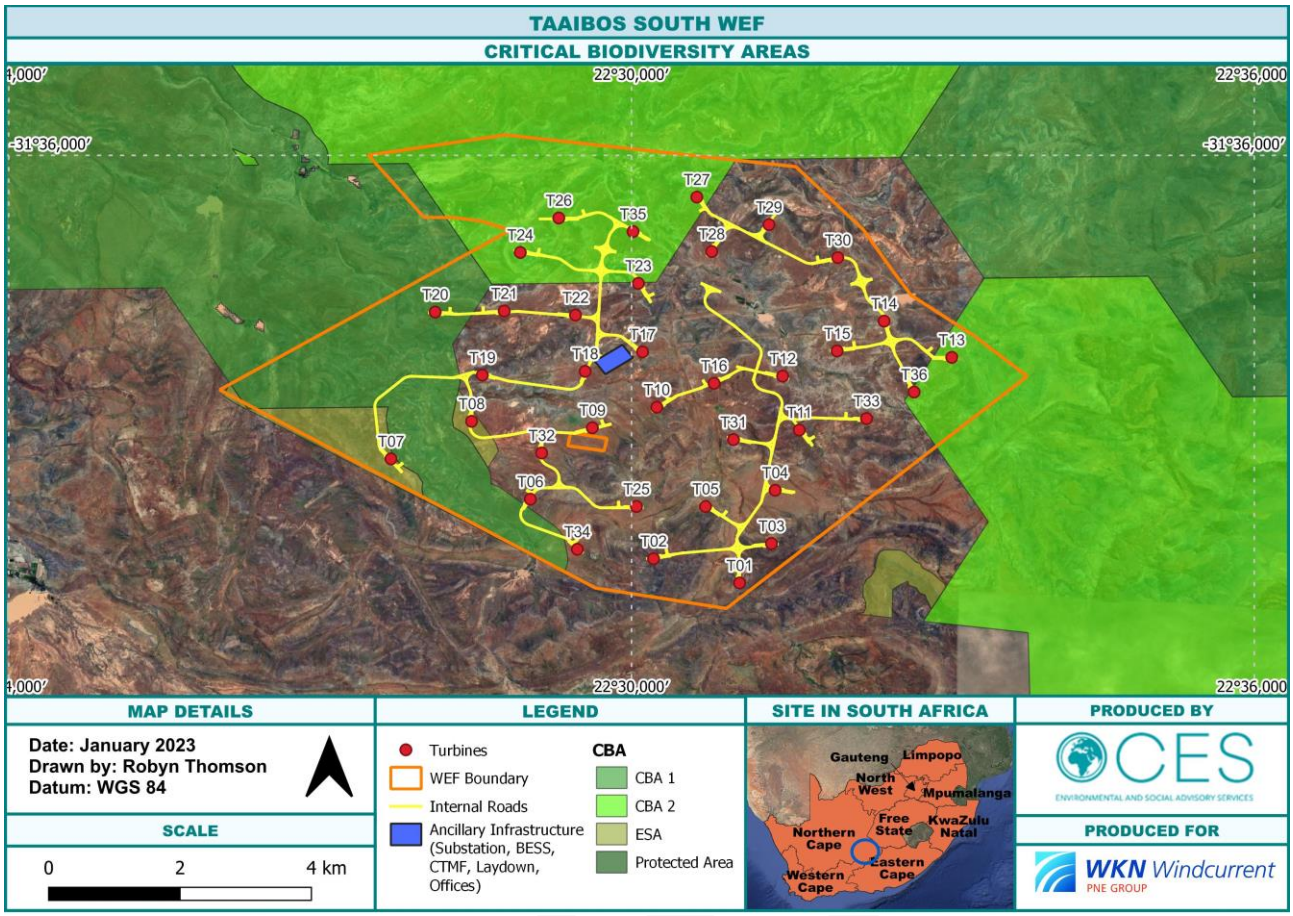

Figure 3-5: Northern Cape Critical Biodiversity Areas.

3.10.3 PROTECTED AREAS

As indicated in the baseline ecological assessment at Section 5 of this Scoping Report, no protected areas are located on the proposed WEF site (Figure 3-6). However, the area between Victoria West and Loxton has been identified by NCPAES (2017) as a Primary Focus area. The reasoning for the priority status is based on the fact that this area forms a key ecological link between major protected areas and is important as a climate change corridor. (Oosthuysen et al. 2017). The project site falls within this region and as such this further highlights the conservation status of the area and the need to reduce impacts to an acceptable level. Please note that based on maps extracted from Oosthuysen et al. 2017 the proposed WEF is situated within the Upper Karoo Primary Focus Area (Figure 3-7) and within the Conservancies in the Upper Karoo facilitated by EWT (Figure 3-8). These are initiatives which have been put in place for the conservation of the riverine rabbit. It must be noted that a riverine specialist has been appointed as part of this process and that they have been engaging with EWT throughout their monitoring and assessment campaign.

There are no provincially legislated Protected Areas occurring within the study area (Figure 3-6).

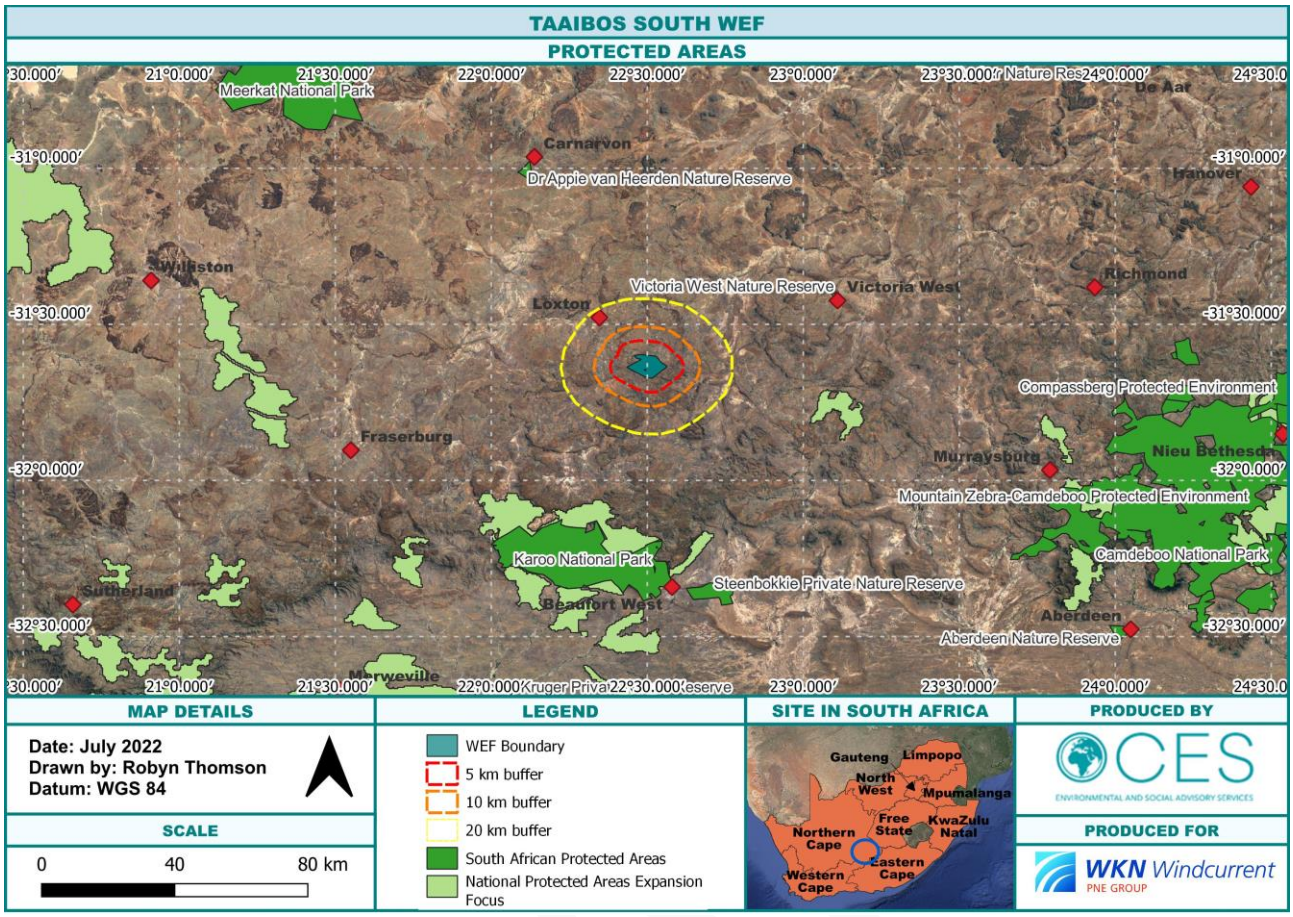

Figure 3-6: Legislated Protected Areas in or around the proposed WEF site.

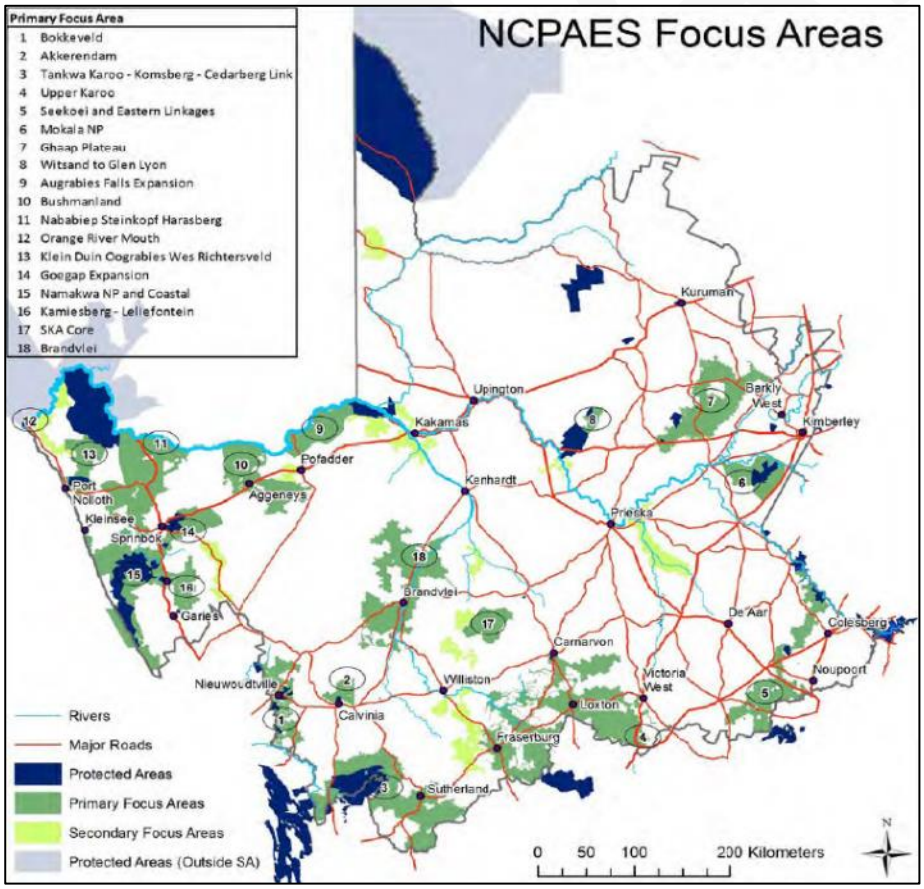

Figure 3-7: NCPAES Focus Areas (Oosthuysen et al. 2017).

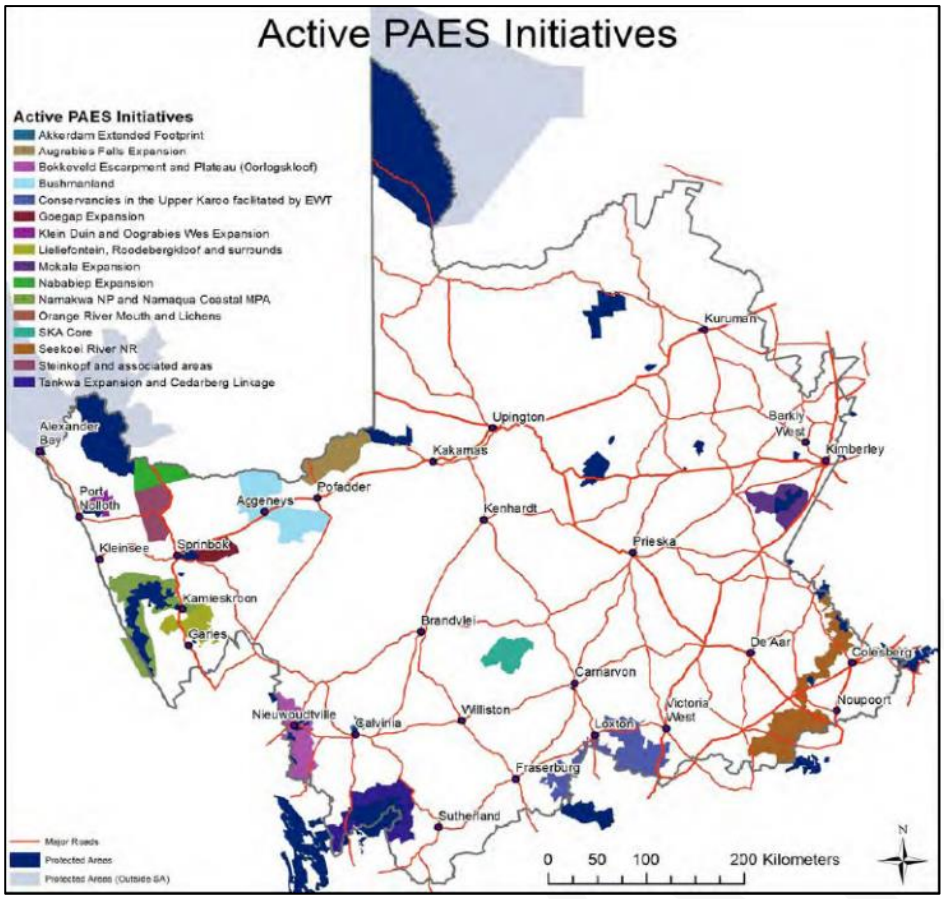

Figure 3-8: Active PAES Initiatives (Oosthuysen et al. 2017).

3.11 CONCLUDING REMARKS

The Northern Cape is the largest Province in the country while also being the least densely populated. It is 6th on the list of provinces in terms of GDP but holds a unique advantage in that it is one of the best sites in the world to produce renewable energy and this potential has attracted to the province a large number of investors under the DoE's Renewable Energy Independent Power Producer Procurement Programme (RE IPP).

When considering the overall need for the development of the proposed WEF, it is clear that the need and desirability is not only supported from a planning and policy perspective on a national level but also at the provincial, district, and most importantly, the local level.

The proposed WEF project developer has also indicated that local socio-economic benefits will be realised with the development of the WEF, specifically in line with the socio-economic development goals under the REIPPPP, which will include:

- The realisation of the local needs and requirements within the area;
- Job creation within an area;
- The creation of a second income for the affected landowners;
- An increase in the standard of living; and
- An overall economic and social upliftment within the area.

The construction and operation of the proposed WEF will contribute to local developmental objectives of poverty eradication and other social and socio-economic benefits that are integral to the REIPPPP process.

The development of wind farms attracts significant direct foreign financial investment into South Africa and local communities. REIPPP local content requirements can lead to the creation of local industry and both skilled and un-skilled jobs in the RE industrial sector.

Further positive social and socio-economic benefits will be realised by the landowners which will host turbines, in the form of rental income which in turn will have multiplier effects on the local economy due to local spend. In addition, farming activities can continue alongside the wind turbines, while rental income may also be used to enhance farming activities.

However, when considering the overall need for the development of the proposed WEF project, it is also important to consider the potential costs of the proposed WEF. Relevant costs associated with the proposed WEF could be particularly applicable due to potential negative impacts on biodiversity conservation initiatives in the affected area (such as the NPAES) and on the commercial activities such as tourism, that rely on the scenic value of the area to attract tourists. These aspects need to be thoroughly investigated in the EIR phase of the EIA process.

DRAFT

4 RELEVANT LEGISLATION

The development of the proposed Taaibos South WEF will be subject to the requirements of various items of South African legislation. These are described below.

4.1 THE CONSTITUTION ACT (ACT NO. 108 OF 1996)

This is the supreme law of the land. As a result, all laws, including those pertaining to the proposed development, must conform to the Constitution. The Bill of Rights - Chapter 2 of the Constitution, includes an environmental right (Section 24) according to which, everyone has the right:

(a) To an environment that is not harmful to their health or well-being.
(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.
    (iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

- *The WEF developer has an obligation to ensure that the proposed activity will not result in pollution and ecological degradation.*
- *The WEF developer has an obligation to ensure that the proposed activity is ecologically sustainable, while demonstrating economic and social development.*

4.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT NO. 107 OF 1998 AND SUBSEQUENT AMENDMENTS)

The National Environmental Management Act (NEMA, Act No. 107 of 1998) provides for basis for environmental governance in South Africa by establishing principles and institutions for decision-making on matters affecting the environment.

A key aspect of the NEMA is that it provides a set of environmental management principles that apply throughout the Republic to the actions of all organs of state that may significantly affect the environment. Section 2 of NEMA contains principles (see Table 4-1) relevant to the proposed WEF project, and likely to be utilised in the process of decision making by DFFE.

Table 4-1. NEMA Environmental Management Principles

(2)	Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.
(3)	Development must be socially, environmentally and economically sustainable.
(4)(a)	Sustainable development requires the consideration of all relevant factors including the following: i. That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied; ii. That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied; iii. That waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner.

(4)(e)	Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.
(4)(i)	The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.
(4)(j)	The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.
(4)(p)	The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.
(4)(r)	Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.

As these principles are utilised as a guideline by the competent authority in ensuring the protection of the environment, the proposed development should, where possible, be in accordance with these principles. Where this is not possible, deviation from these principles would have to be very strongly motivated.

NEMA introduces the duty of care concept, which is based on the policy of strict liability. This duty of care extends to the prevention, control and rehabilitation of significant pollution and environmental degradation. It also dictates a duty of care to address emergency incidents of pollution. A failure to perform this duty of care may lead to criminal prosecution and may lead to the prosecution of managers or directors of companies for the conduct of the legal persons.

Employees who refuse to perform environmentally hazardous work, or whistle blowers, are protected in terms of NEMA.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

- *The WEF developer must be mindful of the principles, broad liability and implications associated with NEMA and must eliminate or mitigate any potential impacts.*
- *The WEF developer must be mindful of the principles, broad liability and implications of causing damage to the environment.*

4.3 NATIONAL ENVIRONMENTAL MANAGEMENT: PROTECTED AREAS ACT (ACT NO. 57 OF 2003)

The National Environmental Management: Protected Areas Act (NEMPAA, Act No. 57 of 2003) mainly provides for the following:

- Declaration of nature reserves and determination of the type of reserve declared.
- Cooperative governance in the declaration and management of nature reserves.
- A system of protected areas in order to manage and conserve biodiversity.
- Utilization and participation of local communities in the management of protected areas.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

The Taaibos South WEF is not within close proximity to any formal protected area.

4.4 NATIONAL ENVIRONMENT MANAGEMENT: BIODIVERSITY ACT (NO. 10 OF 2004)

The National Environment Management: Biodiversity Act (NEM:BA, Act No. 10 of 2004) provides for the management and conservation of South Africa's biodiversity and the protection of species and ecosystems that warrant national protection.

The objectives of this Act are to:

- Provide, within the framework of the National Environmental Management Act.
- Manage and conserve of biological diversity within the Republic.
- Promote the use of indigenous biological resources in a sustainable manner.

The Act provides for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act 107 of 1998. In terms of the Biodiversity Act, the developer has a responsibility for:

1 The conservation of endangered ecosystems and restriction of activities according to the categorisation of the area (including The Endangered and Threatened Ecosystem Regulations, Government Notice R. 1002 dated 9th December 2011).
2 Application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all developments within the area are in line with ecological sustainable development and protection of biodiversity.
3 Limit further loss of biodiversity and conserve endangered ecosystems.

The Act's permit system is further regulated in the Act's Threatened or Protected Species Regulations Government Notice R. 152, dated the 23rd of February 2007.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

- *The WEF developer must not cause a threat to any endangered ecosystems and must protect and promote biodiversity;*
- *The WEF developer must assess the impacts of the proposed development on endangered ecosystems;*
- *The WEF developer may not remove or damage any protected species without a permit; and*
- *The WEF developer must ensure that the site is cleared of alien vegetation using appropriate means (AIS Regulations, Government Notice R. 598 of the 1st of April 2014 are applicable)*

4.5 NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT (NO. 39 OF 2004)

The National Environmental Management: Air Quality Act (NEM:AQA, Act No. 39 of 2004) is the principal legislation regulating air quality in South Africa. The objects of the Act are to:

- Give effect to Section 24(b) of the Constitution in order to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and well-being of people, and
- Protect the environment by providing reasonable measures for:
  - Protection and enhancement of the quality of air in the Republic.
  - Prevention of air pollution and ecological degradation.
- Securing ecologically sustainable development while promoting justifiable economic and social development.

The Air Quality Act empowers the Minister to establish a national framework for achieving the objects of this Act. The said national framework will bind all organs of state. The said national framework will inter alia have

to establish national standards for municipalities to monitor ambient air quality and point, non-point and mobile emissions.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

Although no major air quality issues are expected, the WEF developer needs to be mindful of the Act as it also relates to potential dust generation during construction, etc.

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

The National Environmental Management: Waste Management Act (NEM:WA, Act No. 59 of 2008) gives legal effect to the Government's policies and principles relating to waste management in South Africa, as reflected in the National Waste Management Strategy (NWMS).

The objects of the Act are (amongst others) to protect health, well-being and the environment by providing reasonable measures for:

- Minimising the consumption of natural resources;
- Avoiding and minimising the generation of waste;
- Reducing, re-using, recycling and recovering waste;
- Treating and safely disposing of waste as a last resort;
- Preventing pollution and ecological degradation; and
- Securing ecologically sustainable development while promoting justifiable economic and social development.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

- *The WEF developer must ensure that all activities associated with the project address waste related matters in compliance with the requirements of the Act.*
- *The WEF developer must consult with the local municipalities to ensure that waste is disposed of at a registered landfill site.*

4.7 National Forests Act (No. 84 of 1998)

The objective of this Act is to monitor and manage the sustainable use of forests. In terms of Section 12 (1) (d) of this Act and GN No. 1012 (promulgated under the National Forests Act), no person may, except under licence:

- Cut, disturb, damage or destroy a protected tree.
- 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.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

If any protected trees or indigenous forest in terms of this Act occur on site, the WEF developer will require a licence from the Department of Forestry, Fisheries and the Environment (DFFE) to perform any of the above-listed activities.

4.8 National Heritage Resources Act (No. 25 of 1999)

The protection of archaeological and paleontological resources is the responsibility of a provincial heritage resources authority and all archaeological objects, paleontological material and meteorites are the property of the State. "Any person who discovers archaeological or paleontological objects or material or a meteorite in the course of development must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority".

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

- *SAHRA must be informed of the project and EIA process.*
- *A Heritage Impact Assessment (HIA) must be undertaken by a suitably qualified specialist.*
- *No person may alter or demolish any structure or part of a structure, which is older than 60 years or disturb any archaeological or paleontological site or grave older than 60 years without a permit issued by the relevant provincial heritage resources authority.*
- *No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter or deface archaeological or historically significant sites.*

4.9 Electricity Regulation Act (No. 4 of 2006)

The Electricity Regulation Act (Act No. 4 of 2006) came into effect on the 1st of August 2006 and the objectives of this Act are to:

- Facilitate universal access to electricity.
- Promote the use of diverse energy sources and energy efficiencies.
- Promote competitiveness and customer and end user choice.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

The proposed WEF is in line with the call of the Electricity Regulation Act as it has the potential to improve energy security of supply through diversification.

4.10 Occupational Health and Safety Act (No. 85 of 1993)

The objective of this Act is to provide for the health and safety of persons at work. In addition, the Act requires that, "as far as reasonably practicable, employers must ensure that their activities do not expose non-employees to health hazards". The importance of the Act lies in its numerous regulations, many of which will be relevant to the proposed Taaibos South WEF. These cover, among other issues, noise and lighting.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

The WEF developer must be mindful of the principles and broad liability and implications contained in the OHSA and mitigate any potential impacts.

4.11 Aviation Act (No. 74 of 1962): 13th Amendment of the Civil Aviation Regulations 1997

Section 14 of obstacle limitations and marking outside aerodrome or heliport (CAR Part 139.01.33) under this Act specifically deals with wind turbine generators (wind farms). According to this section, "A wind turbine generator is a special type of aviation obstruction due to the fact that at least the top third of the generator is continuously variable and offers a peculiar problem in as much marking by night is concerned. The Act

emphasizes that, when wind turbine generators are grouped in numbers of three or more, they will be referred to as "wind farms".

Of importance to the proposed Taaibos South WEF project are the following:

- Wind farm placement: Due to the potential of wind turbine generators to interfere on radio navigation equipment, no wind farm should be built closer than 35 km from an aerodrome. In addition, much care should be taken to consider visual flight rules routes, proximity of known recreational flight activity such as hang gliders, en-route navigational facilities etc.
- Wind farm markings: Wind turbines shall be painted bright white to provide the maximum daytime conspicuousness. The colours grey, blue and darker shades of white should be avoided altogether. If such colours have been used, the wind turbines shall be supplemented with daytime lighting, as required.
- Wind farm lighting: Wind farm (3 or more units) lighting: In determining the required lighting of a wind farm, it is important to identify the layout of the wind farm first. This will allow the proper approach to be taken when identifying which turbines need to be lit. Any special consideration to the site's location in proximity to aerodromes or known corridors, as well as any special terrain considerations, must be identified and addressed at this time.
- Turbine Lighting Assignment: The following guidelines should be followed to determine which turbines, need to be equipped with lighting fixtures. Again, the placement of the lights is contingent upon which type of configuration is being used.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

Due to requirements of the Act to ensure the safety of aircrafts, the WEF developer must engage directly with the Civil Aviation Authority regarding the structural details of the facility.

4.12 NATIONAL WATER ACT (NO. 36 OF 1998)

The National Water Act (NWA, Act No. 36 of 1998) provides for fundamental reform of the law relating to water resources in South Africa.

The purpose of the Act amongst other things is to:

- Ensure that the national water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors:
  - Promoting equitable access to water.
  - Promoting the efficient, sustainable and beneficial use of water in the public interest.
  - Facilitating social and economic development.
  - Protecting aquatic and associated ecosystems and their biological diversity.
  - Reducing and preventing pollution and degradation of water resources.

The NWA is concerned with the overall management, equitable allocation and conservation of water resources in South Africa. To this end, it requires registration of water users and licenses to be obtained for water use except for certain limited instances set out in the Act. These instances include domestic use, certain recreational use, where the use occurs in terms of an existing lawful use or where the Department of Water Affairs (DWA) has issued a general authorisation that obviates the need for a permit.

Water use for which a permit is required

For the purposes of this Act, water uses for which a permit is required (amongst other), are defined in Section 21 as follows:

- Taking water from a water resource.
- Storing water.
- Impeding or diverting the flow of water in a watercourse.
- Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit.

- Disposing of waste in a manner which may detrimentally impact on a water resource.
- Altering the bed, banks, course or characteristics of a watercourse.

*** PLEASE NOTE THAT GENERAL AUTHORISATIONS (GAS) AND WULAS ARE ONLY AUTHORISED TO BE SUBMITTED TO DWS ONCE A WIND ENERGY FACILITY HAS BEEN GRANTED PREFERRED BIDDER STATUS. SHOULD TAAIBOS SOUTH WEF BE GRANTED PREFERRED BIDDER STATUS THEN WULAs WILL BE SUBMITTED FOR CONSIDERATION BY THE DWS.**

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

There may be certain instances where the WEF developer may need to obtain approval in terms of the Water Act.

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

The Conservation of Agricultural Resources Act (CARA, Act No. 43 of 1983) is the main statute that deals with agricultural resource conservation.

The objects of the Act are to provide for the conservation of the natural agricultural resources of South Africa by the maintenance of the production potential of land. In order to maintain production potential of land, CARA provides for the following mechanisms; namely:

- Combating and prevention of erosion and weakening and destruction of water sources.
- Protection of vegetation.
- Combating of weeds and invader plants.

In order to give meaning to mechanisms aimed maintaining production potential of land provided for in CARA, Minister of Agriculture published regulations under CARA (CARA Regulations) which prescribes control measures which all land users have to comply, in respect of a number of matters, including the:

- Cultivation of virgin soil.
- Protection of cultivated land.
- Utilisation and protection of the veld.
- Control of weed and invader plants.
- Prevention and control of veld fires and the restoration and reclamation of eroded land.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

The proposed Taaibos South WEF site is not deemed to be situated on high agricultural land with high potential. Preventative measures must be considered as part of the EMPr to ensure that farmers are able to continue using their land as livestock grazing as far as possible.

4.14 Subdivision of Agricultural Land Act (No. 70 of 1970)

The Subdivision of Agricultural Land Act (Act No. 70 of 1970) controls the subdivision of all agricultural land in South Africa and prohibits certain actions relating to agricultural land. In terms of the Act, the owner of agricultural land is required to obtain consent from the Minister of Agriculture in order to subdivide agricultural land.

The purpose of the Act is to prevent uneconomic farming units from being created and degradation of prime agricultural land. The Act also regulates leasing and selling of agricultural land as well as registration of servitudes.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

Approval will be required from the DFFE for any activities on the land zoned for agriculture and any proposed rezoning or sub-divisions of agricultural land.

4.15 MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (NO. 28 OF 2002)

Mineral and Petroleum Resources Development Act (MPRDA, Act No. 28 of 2002) makes provision for equitable access to and sustainable development of the South Africa's mineral and petroleum resources and to provide for matters connected therewith.

The objects of this Act are (amongst others) to:

- Give effect to the principle of the State's custodianship of the nation's mineral and petroleum resources.
- Promote equitable access to the nation's mineral and petroleum resources to all the people of South Africa.
- Give effect to Section 24 of the Constitution by ensuring that the nation's mineral and petroleum resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development.

Application for a mining right

As per Section 27 (1) of the Act, the Department of Minerals Resources (DMR) must grant permission for all mining operations. Both the removal of sand and/or stone from a borrow pit or quarry requires an application for a mining permit or a mining right.

There are two (2) categories of permission relevant to borrow pits and hard rock quarries, namely; "Mining Permits" and secondly "Mining Rights." As is reflected in the table below, these categories are linked to the size of the proposed operation and the proposed operational period.

CATEGORY	SIZE	PERIOD OF OPERATION	DMRE REQUIREMENT
Mining Permit	< 1.5 ha	< 2 years	EIA: Basic Assessment Environmental Management Programme (EMPr)
Mining Right (Licence)	> 1.5 ha	< 30 years	EIA: Scoping and EIA Environmental Management Programme (EMPr)

In addition, Section 53 of the Act requires that Ministerial approval is attained for "any person who intends to use the surface of any land in any way which may be contrary to any object of this Act or is likely to impede any such object".

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

- *Any activities associated with the WEF requiring extraction of sand or hard rock for construction purposes will require the submission of an application to DMRE for either a mining permit or mining licence.*
- *The Taaibos South WEF must apply to the Minister of Mineral Resources for approval to use the land for the purposes of the WEF.*
- *The DMRE has aligned its authorisation process with that of the DEA, and from August 2015, all applications for mining activities require an Environmental Impact Assessment, as per the EIA Regulations.*

4.16 NATIONAL ROAD TRAFFIC ACT (NO. 93 OF 1996)

The National Road Traffic Act (NRTA, Act No. 93 of 1996) provides for all road traffic matters and is applied uniformly throughout South Africa. The Act enforces the necessity of registering and licensing motor vehicles. It also stipulates requirements regarding fitness of drivers and vehicles as well as making provision for the transportation of dangerous goods.

RELEVANCE TO THE PROPOSED TAAIBOS SOUTH WEF

All the requirements stipulated in the NRTA will need to be complied with during the construction and operational phases of the proposed wind farm.

4.17 National Veld and Forest Fire Act (No. 101 of 1998)

The aim of the Act is to "prevent and combat veld, forest and mountain fires" in South Africa. Of particular relevance to the proposed Taaibos South WEF development the following requirements of the Act need to be considered:

RELEVANT SECTION OF THE ACT	RELEVANT TO THE PROPOSED TAAIBOS SOUTH WEF:
Section 3: Fire Protection Associations.	The proposed Taaibos South WEF must register as a member of the fire protection association in the area.
Chapter 4 Section 12-14: Veld fire prevention: duty to prepare and maintain firebreaks	The proposed Taaibos South WEF will be required to take all practicable measures to ensure that fire breaks are prepared and maintained according to the specifications contained in Section 12 – 14.
Section 17: Firefighting: readiness	The proposed Taaibos South WEF must have the appropriate equipment, protective clothing and trained personnel for extinguishing fires.

4.18 Other Relevant National Legislation

Other legislation that may be relevant to the proposed Taaibos South WEF includes:

- The Environment Conservation Act No 73 of 1989 (ECA) Noise Control Regulations, which specifically provide for regulations to be made with regard to the control of noise, vibration and shock, including prevention, acceptable levels, powers of local authorities and related matters.
- The Telecommunication Act (1966) which has certain requirements with regard to potential impacts on signal reception.
- Provincial Nature and Environmental Conservation Ordinance (No. 19 of 1974), which lists species of special concern which require permits for removal. Schedules 1 to 4 list protected and endangered plant and animal species.
- Spatial Planning and Land Use Management Act (SPLUMA) (Act 16 of 2013 – came into force on 1 July 2015) aims to provide inclusive, developmental, equitable and efficient spatial planning at the different spheres of the government. This act repeals national laws on the Removal of Restrictions Act, Physical Planning Act, Less Formal Township Planning Act and Development Facilitation Act.

In addition to the above, aside from the environmental authorisation, there are other permits, contracts and licenses that will need to be obtained by the project proponent for the proposed project some of which fall outside the scope of the EIA. However, for the purposes of completeness, these include:

- Local Municipality: Land Rezoning Permit. LUPO Ordinance 15 of 1985.
- National Energy Regulator of South Africa (NERSA): Generation License.
- Eskom: Connection agreement and Power Purchase Agreement (PPA).
- Ubuntu Local Municipality Spatial Development Framework (SDF), Integrated Development Plan (IDP) and municipal by-laws.
- Pixley Ka Seme District Municipality SDF and IDP.

5 DESCRIPTION OF THE ENVIRONMENT: BIOPHYSICAL

The following chapter outlines the biophysical features of the property portions on which the proposed Taaibos South WEF is being proposed.

5.1 GEOLOGY AND LANDFORM

The Northern Cape Province is the largest in South Africa, with an area of 372,889 km². While the province contains a wide variety of landscapes it is dominated by the Karoo Basin and consists mostly of sedimentary rocks and some dolerite intrusions.

5.2 TOPOGRAPHY

The project site is located to the West of Victoria West within the Ubuntu Local Municipality. This area is dominated by flats with gently sloping plains. The area known as the Upper Karoo Hardeveld in the west is interspersed with hills and some rocky areas. The average height range of for this area is between 1000-1700masl.

5.3 GEOLOGY

The geology of the project site is mostly dominated by horizons of dolerite rocks. Dolerite covers approximately 36% of the Greater Pixley Ka Seme area, followed by Tillite (12%) and the rock types Sand, Andesite, and Quartzite covering between 7% and 5% of the area respectively. The remainder of the rock types cover less than 4%. (Pixley Ka Seme District SDF 2007)

Overall, the region's rocky areas and hilltops are mostly caved sandstone with a shallow covering of loose sandy soils. The lower lying areas, flatter slopes and undulating territory have deeper layers of loose sandy top soils that are underlain either by decomposed shale, mudstones or sandstones. Over time those areas dominated by shale deposits have decomposed turning into clay. In many of the areas where the drainage is poor it is found that the underlying soils consist of decomposed clay minerals. These clays have been known as to be problematic when it comes to buildings, often resulting in cracks and shifting.

The project area itself is in the Southern Portion of the Pixley Ka Seme Municipality and is mostly underlain by Mudstone. This area is characterised by sedimentary rocks that are built up of particles originating from the weathering of other rocks and deposited in one or another depositional basin. Clay-sized particles (referred to as Mud) are transported in suspension in water and eventually settle in freshwater lakes. After compaction and cementing this results in what is referred to as mudstone. Mudstone occurs after a process of coarse-grained sandstone alternating with fine-grained mudrock. The most widespread occurrence is in the Karoo strata, which covers 75% of the central subcontinent. This mudstone weathers to a clayey soil, which may have expansive characteristics depending on the origins of the soils from which the rock formed. In some areas mudrock is weathered to great depths. The soils are usually highly erodible and dispersive. The soils in this area are highly dispersive and this result in deep dongas forming on many slopes in the Karoo.

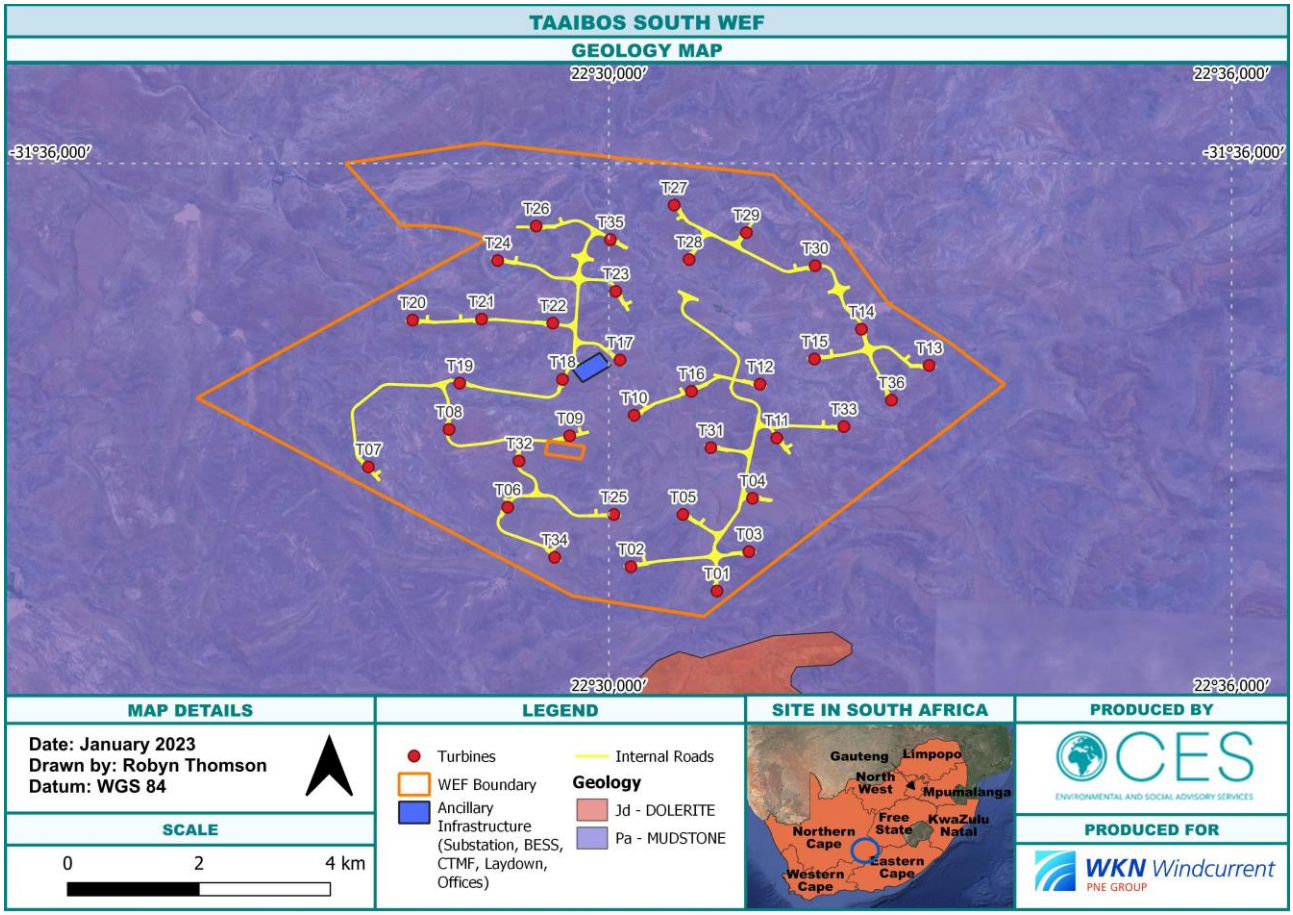

Figure 5-1: Geology Map of the Taaibos South WEF site.

5.4 CLIMATE

Due to the large size of the Northern Cape Province the climate profile is complex and varies greatly from the coastal to the inland regions. The weather in the Victoria West and Loxton area is influenced by the local steppe climate, meaning there is little rainfall throughout the year with the peak being between Autumn and Summer. January and March generally experience the highest levels of precipitation. (en.climate-data.org)

The area surrounding Victoria West and Loxton and the project site experiences seasonally high winds. The highest average wind speeds are between June and February, with average ground level wind speeds of more than 17km per hour. The windiest month of the year in the area is November, with an average ground level hourly wind speed of 19km per hour (weatherspark.com)

Table 5-1 Taaibos South WEF General Climate Table (Source: en.climate-data.org).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg. Temp (°C)	23.1	22.8	20.6	16.0	12.3	8.6	8.4	10.6	14.2	17.6	19.8	22.2
Min. Temp (°C)	15.1	15.3	13.5	9.6	6.2	2.6	2.1	3.3	6.1	9.2	11.1	13.9
Max. Temp (°C)	30.6	30.1	27.7	22.5	18.8	15.2	15.3	17.9	21.9	25.3	27.6	30.0
Precipitation / Rainfall (mm)	40	37	40	25	16	11	10	11	12	20	23	30

5.5 HERITAGE FEATURES

5.5.1 ARCHAEOLOGY

The history of the Northern Cape Province is reflected in a rich archaeological landscape, mostly dominated by Stone Age and Colonial Period occurrences. In addition to prehistoric remnants, the archaeological record reflects the development of a rich colonial frontier, characterised by farming and later, a number of war conflicts, particularly the Anglo Boer War (or the South African War) left behind the remnants of battlefields, skirmishes and concentration camps.

The archaeology of the Northern Cape is rich and varied covering long spans of human history. Some areas are richer than others, and not all areas are equally significant. According to Humphreys (1987:117), `the amount of archaeological research that has been undertaken in the Karoo is in no way proportional to its importance in terms of area in South Africa'. While it is true to say that this part of the Karoo has probably been relatively marginal to human settlement for most of its history, it is in fact exceptionally rich in terms of Stone Age and rock art (Beaumont & Morris 1990; Morris and Beaumont 2004). Archaeologists from the McGregor Museum in Kimberley have focussed much of their attention on the Upper Karoo region and the northern periphery of the Karoo, where most of their academic research has been done. A few Archaeological Impact Assessments have been undertaken (as part of the EIA process) in Victoria West and De Aar (Morris 2000, 2004, 2006, 2007, 2010, 2012, 2019), where these have been required.

Contrary to its arid appearance, the Karoo had a relatively high carrying capacity and teamed with game long before European Colonization. Hunter gatherers (mainly San) successfully occupied the central interior of South Africa during the last 4500 years, subsisting on the large herds of grazing animals that occurred during that time (Sampson 1985; Sampson et al 1989). Late Stone Age archaeological sites dating to the late Holocene (within the last 4000 years) are surprisingly common. Although the Karoo is presently more suited to the keeping of small stock such as sheep and goats, research in the Eastern Karoo has revealed that, at about 1200 – 1400 AD, a climatic fluctuation (known as the Little Ice-Age) may well have caused an increased rainfall in the central Karoo resulting in the area being more suitable for grazing of cattle and occupation by Khoekhoen pastoralist groups. They left behind an archaeological legacy that consists of stone kraal complexes of which several hundred have been recorded in the Zeekoe Valley in the eastern Karoo and the Riet River area in the Northern Cape (Hart 1989). The indigenous people of Karoo waged a bitter war against colonial expansion as they gradually lost control of their traditional land. With the implementation of the commando system in the late 18th and early 19th centuries, the Karoo "Bushmen" were eventually destroyed or indentured into farm labour (Hart 1989).

Remnants of Stone Age archaeology in this landscape are mainly MSA and LSA tools. These tool scatters are often found spread very thinly and unevenly on the surface. MSA tools comprise mainly thick chunky flakes, chunks, flaked chunks, blade tools and a few retouched flakes mostly on weathered hornfels/lydianite. LSA lithics often comprise mostly unmodified, utilized and retouched flakes, chunks and cores on un-weathered hornfels. Formal tools such as scrapers, points and adzes are found in these contexts. In certain instances, the stone tools occur in association with organic remains or other cultural remains such as pottery or ostrich eggshell or even potable art. Rock art in the form of engravings on large boulders – often dolerite – as well as stone "gongs" are often found in these areas on rock outcrops and koppies. For example, Kaplan (2010) located several rock engravings on the Swartkoppies Mountains near Britstown northeast of the project areas where imagery of eland and ostriches were pecked on dolerite boulders.

Depending on the range, extent and integrity of site and artefact contexts, the significance of archaeological remains ranges from low to high on a regional level.

5.5.2 HISTORICAL/COLONIAL PERIOD

The first "Trekboers" moved through the landscape during the early 19th century but it was only in 1843 that Victoria West was laid out on the bank of the Brakrivier watercourse when the Dutch Reformed Church bought the farm Zeekoegat from the estate of J.H. Classens. In 1859 the town acquired municipal status and it became an important staging point along the Diamond Way linking Cape Town with the diamond fields in Kimberley and later the gold fields along the Witwatersrand. In addition, the region became well known for sheep farming and the landscape was divided into farms towards the end of the 1800's. As a result, important historical remnant in this area are farmsteads and associated features. Farmsteads are complex features in the landscape made up of different yet interconnected elements. Typically, these farmsteads consist of a main house, gardens, outbuildings, sheds and barns, with some distance from that labourer housing and family cemeteries. Farm buildings are generally single storied but town houses often reached two floors. Walls are thick and built with stone and the ridged roof, thatched or tiled, are terminated at either end by simple linear parapet gables. In some instances, outbuildings would be in the same style as the main house, if they date to the same period. Roads and tracks, stock pens and wind mills occur on farms across the project landscape.

Farms also hold the remains of "veewagtershuise" or shepherd's huts, typically single roomed buildings constructed out of undressed sandstone blocks. The huts occur in the veld where they served as temporary shelter for livestock shepherds. Material culture such as glass, metal fragments and fragments of ceramics and earthenware are often found at these sites. Infrastructure and industrial heritage such as roads, bridges, railway lines, electricity lines and telephone lines are also feature in this landscape. In addition, infrastructure associated with the Anglo Boer War (fortifications, block houses – e.g. at Merriman, the remains of field hospitals, burial sites) occur around Victoria West.

Historical / Colonial Period remnants are generally viewed to have a medium to high significance on a regional level.

5.5.3 GRAVES/CEMETERIES

Apart from the formal cemeteries that occur in municipal areas (e.g. in Victoria West), informal burial sites occur in the project landscape. These might range from family graveyards at farmsteads to individual unmarked graves in the veld and war graves.

The various cemeteries, burial places and graves are viewed to have a high significance on a local level.

5.6 PALAEONTOLOGICAL CONTEXT OF THE AREA

The Middle to Late Permian Abrahamskraal and Teekloof Formation bedrocks in the combined Victoria West Cluster and Grid Connection study area are characterised by fossil assemblages of the Tapinocephalus and Endothiodon Assemblage Zones (the latter was previously termed the Pristerognathus and Tropidostoma Assemblage Zones (Kitching 1977, Keyser & Smith 1977-78, Rubidge 1995, Rubidge 2005, Van der Walt et al. 2010, Smith et al. 2012, Smith et al. 2020, Day & Rubidge 2020b, Day & Smith 2020). They include a wide range of fossil tetrapods - especially reptiles and therapsids ("mammal-like reptiles" or protomammals"") - as well as fish, amphibians, plant remains (e.g. petrified wood, plant compressions), microfossils and trace fossils (e.g. vertebrate and invertebrate burrows, trackways).

Only a few historical vertebrate fossil sites are mapped in the vicinity of the project area on the published 1: 250 000 geological map. The Karoo fossil vertebrate site map of Nicolas (2007) shows areas of high as well as low density of fossil records here (Fig. 4). Important concentrations of fossil sites are known, for example, as a result of a long history of palaeontological fieldwork in the Biesiespoort area as well as around Melton

Wold. Recent palaeontological fieldwork by the present author for WEF project areas in the broader Loxton – Victoria West – Beaufort West region (e.g. Nuweveld WEFs, Hoogland WEFs, Modderfontein WEF) and earlier research by other Karoo palaeontologists (e.g. Smith 1993) suggest that numerous unrecorded fossil sites of scientific and conservation value are likely to occur here. New tetrapod fossil finds within the project area should help resolve outstanding lithostratigraphic ambiguities in the region as well as contributing to on-going scientific research concerning palaeoenvironmental and evolutionary events before and during the catastrophic end-Middle Permian Extinction Event of c. 260 million years ago as well as during the succeeding biotic recovery (Retallack et al. 2006, Day et al. 2015).

Most of the varied Late Caenozoic superficial sediments within the project area are largely of low palaeosensitivity. However, relict consolidated older (Neogene / Pleistocene) alluvial deposits along drainage lines may contain sporadic fossil assemblages of mammals (bones, teeth, horn cores), freshwater invertebrates and trace fossils.

Preliminary mapping using the DFFE Screening Tool as well as SAHRIS indicates that most of the combined Taaibos/Soutrivier Cluster and Grid Connection projects area is of Very High Palaeosensitivity. Thick alluvial deposits are assigned a Medium Sensitivity while dolerite intrusions are insensitive (i.e. unfossiliferous). Based on recent experience with WEFs in the broader region, this preliminary palaeosensitivity mapping is likely to be contested following the planned field-based palaeontological surveying. While fossil sites of high palaeontological and conservation value are almost certain to occur within the Taaibos/Soutrivier Cluster and Grid Connection project areas, they are probably very sporadic in distribution.

5.7 LANDCOVER

The site visit illustrated that the project area is used for various activities such as livestock farming, game farming and households.

Figure 5-2 illustrates the landcover of the Taaibos South WEF site and surrounding areas (Northern Cape Land Use Data, AGIS).

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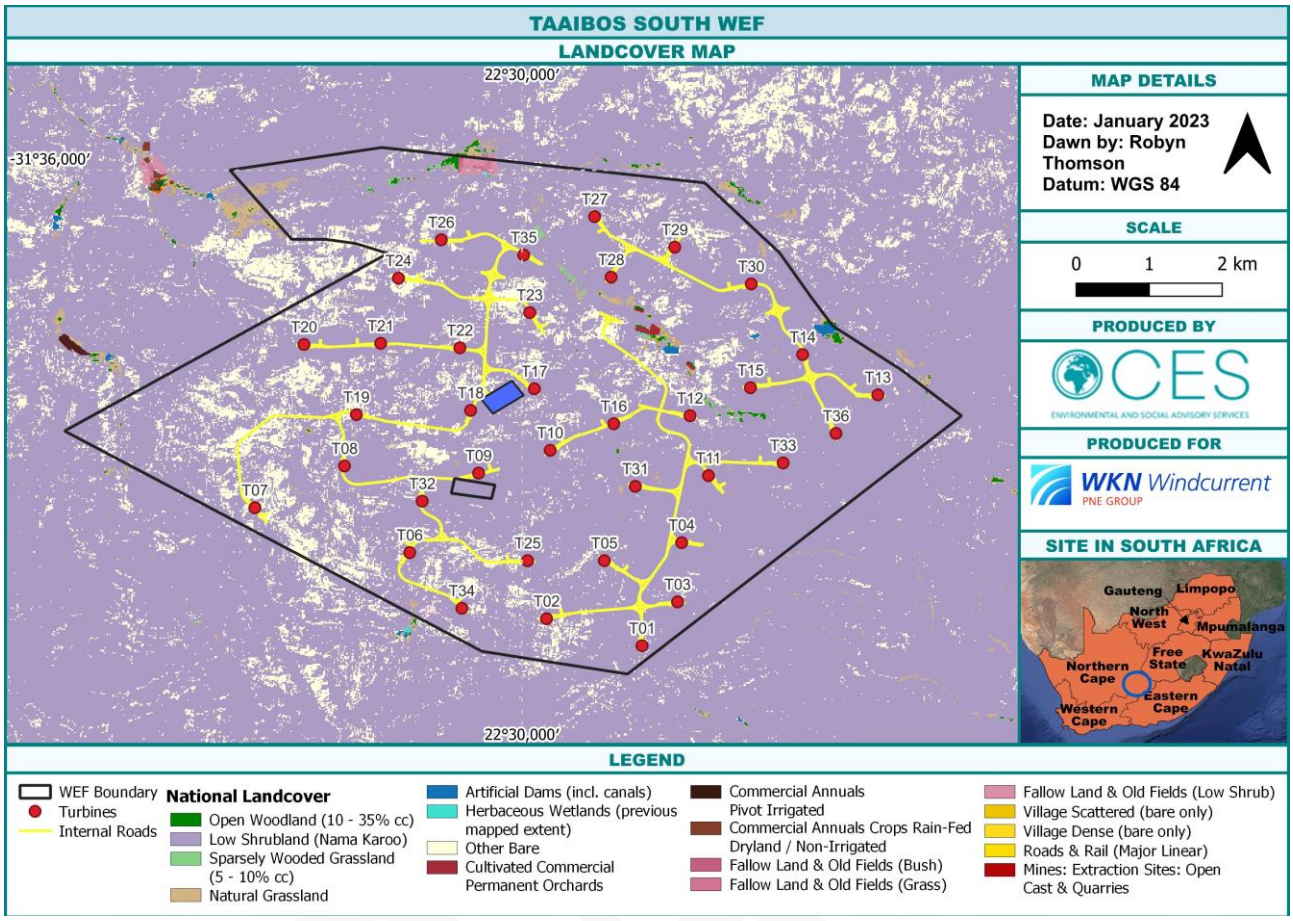

Figure 5-2: Landcover Map of the Taaibos South WEF site and surrounding areas.

5.8 VEGETATION & FLORISTICS

The greater Nama-Karoo Biome of which the project area forms part of, is the third largest biome in South Africa, covering approximately 20.5% of the country. It stretches across the central plateau of the western half of the country. It is classified as semi-arid with the majority of vegetation being deciduous plants, low shrubs and grasses.

The Pixley Ka Seme District Municipality is located towards the Eastern extent of the Nama- Karoo Biome and is in itself a unique biodiversity area. The area around the project site is mostly rural and these areas are dominated by natural vegetation that, although classified as hardy due to the limited rainfall that supports it, can be sensitive and slow to recover and rehabilitate if not managed suitably.

Nama-Karoo covers 87% of the area in the Pixley Ka Seme District and forms the transition area between the Cape flora area to the south and the tropical savanna areas in the north. Many of the plant species of the Nama-Karoo also occur in the savanna, grassland, succulent Karoo, and fynbos biomes.

5.8.1 SANBI VEGETATION MAP

Mucina and Rutherford (2006) developed the National Vegetation map as part of a South African National Biodiversity Institute (SANBI) funded project: "It was compiled in order to provide floristically based vegetation units of South Africa, Lesotho and Swaziland at a greater level of detail than had been available

before." The map was developed using a wealth of data from several contributors and has allowed for the best national vegetation map to date, the last being that of Acocks developed over 50 years ago. The SANBI Vegetation map informs finer scale bioregional plans such as STEP. This SANBI Vegmap project has two main aims:

- "to determine the variation in and units of southern African vegetation based on the analysis and synthesis of data from vegetation studies throughout the region, and
- to compile a vegetation map. The aim of the map was to accurately reflect the distribution and variation on the vegetation and indicate the relationship of the vegetation with the environment. For this reason the collective expertise of vegetation scientists from universities and state departments were harnessed to make this project as comprehensive as possible."

The map and accompanying book describes each vegetation type in detail, along with the most important species including endemic species and those that are biogeographically important. This is the most comprehensive data for vegetation types in South Africa. According to this spatial planning tool, 3 vegetation types are found to occur within the greater project area.

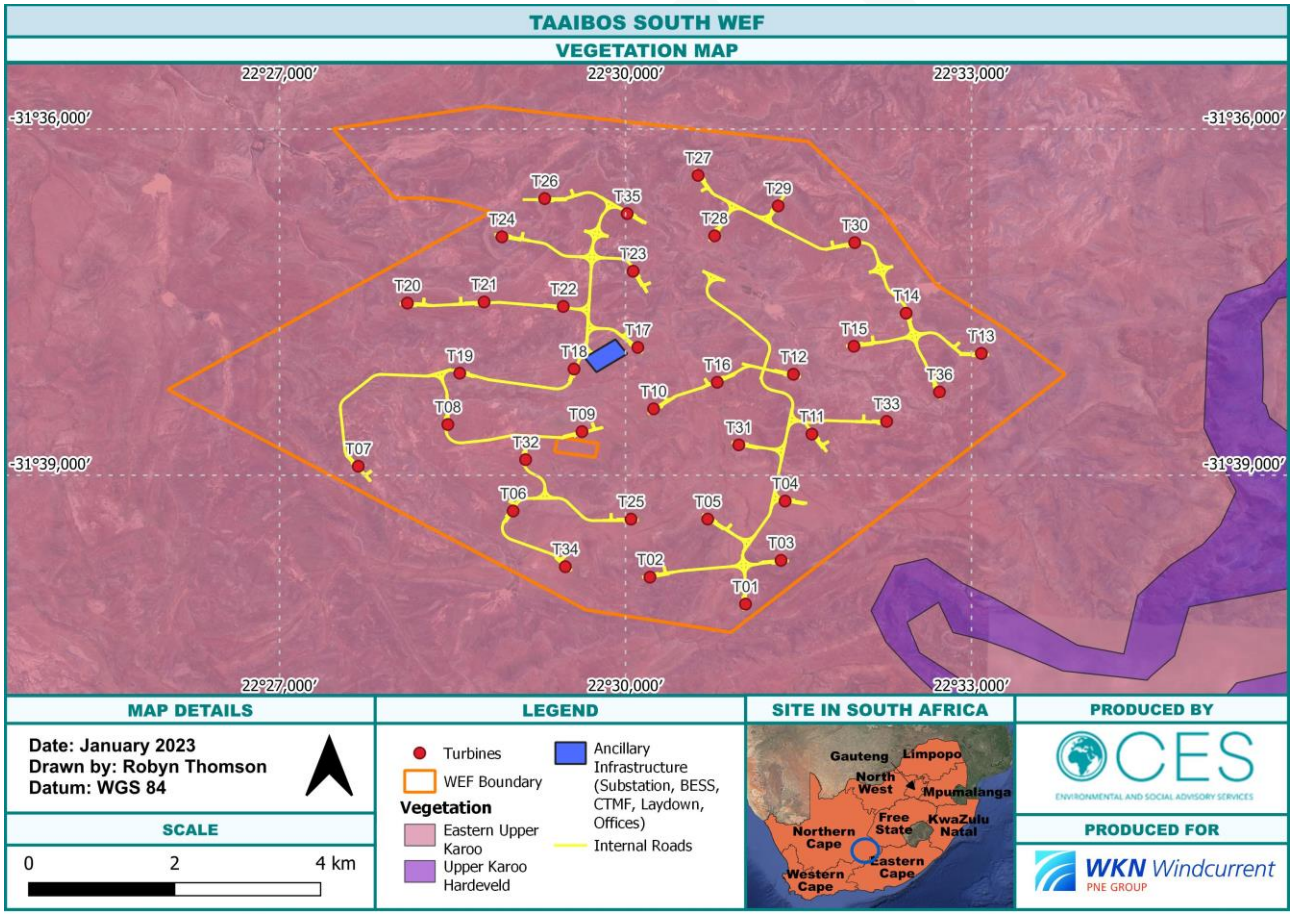

Figure 5-3: SANBI Vegetation Map of the Taaibos South WEF site and surrounding areas.

A) Eastern Upper Karoo

The Eastern Upper Karoo vegetation type covers the entire project site and consists of flats and gently sloping plains. These areas are often interspersed with the koppies and ridges of the Upper Karoo Hardeveld as described above. The flora is dominated by dwarf microphyllous shrubs with typical white grasses of the genera *Aristida* and *Eragrostis*. Grass cover is seasonal and becomes more prominent after heavy rainfall (generally from late autumn to summer). This vegetation type is considered LEAST THREATENED with a

conservation target of 21%. There are however statuary conservation targets within a number of National Parks and protected areas.

5.9 NORTHERN CAPE CRITICAL BIODIVERSITY AREAS

Critical Biodiversity Areas are areas required to meet biodiversity targets for ecosystems, species and ecological processes, as identified in a systematic biodiversity plan. Ecological Support Areas are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of Critical Biodiversity Areas and/or in delivering ecosystem services. The CBAs for each province have been compiled based on extensive biological data as well as input from key stakeholders. While the CBAs are a high-level reflection of the conditions expected it is imperative that the actual status of the environment be determined.

1. Critical Biodiversity Area 1 (CBA 1) – CBA 1 designated areas are those that have been identified as priority areas to be retained in order to meet conservation targets. The land use guidelines for CBA 1 designated areas recommend no further development. The designation may not necessarily be based on the condition of the habitat, species composition, ecological connectivity or overall ecological value since it is largely based on a statistical analysis process.
2. Critical Biodiversity Area 2 (CBA 2) – As for above, however these areas are deemed to be degraded but deemed priority areas. The land use recommendations for CBA 2 designated areas are broadly speaking restore and maintain to meet conservation targets. Since available area within the site boundaries that is not categorised as CBA 1 or CBA 2 is limited and inadequate, the most suitable or least risky area for utilisation will be the CBA 2 designated areas.
3. Aquatic CBA and/or Freshwater Ecosystem Priority Areas – the southern portion of the Taaibos site is designated FEPA. Refer to aquatic assessment for recommendations, but terrestrial impact is unlikely to be a significant consideration in this area in comparison to other areas, as long as water flows are not substantially altered.

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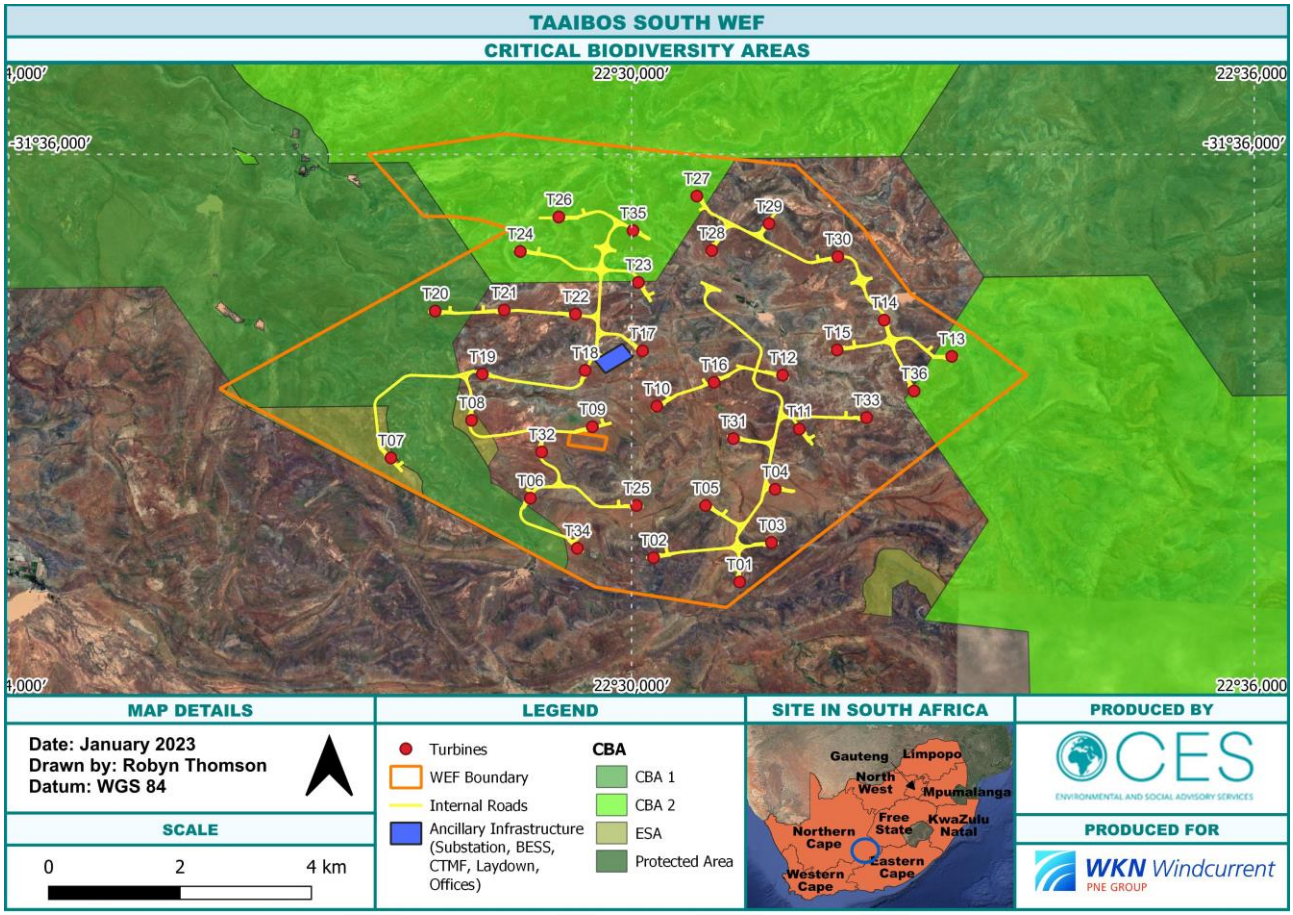

Figure 5-4: CBA Map of the proposed Taaibos South WEF site and surrounding areas.

5.10 NORTHERN CAPE PROTECTED AREA EXPANSION STRATEGY

The Northern Cape Protected Area Expansion Strategy (NCPAES) was developed in 2017 based on the current Northern Cape CBA as well as specialist input in order to identify and prioritise protected area expansion for ecological sustainability and increased resilience to climate change. The area between Victoria West in the East and Loxton in the west have been identified by NCPAES as a Primary Focus area. The reasoning for the priority status is based on the fact that this area forms a key ecological link between major protected areas and is important as a climate change corridor. (Oosthuysen *et al.* 2017). The project site falls within this region and as such this further highlights the conservation status of the area and the need to reduce impacts to an acceptable level.

5.11 FAUNA

Amphibians and reptiles are well represented in sub-Saharan Africa. However, distribution patterns in southern Africa are uneven both in terms of species distribution and in population numbers (du Preez and Carruthers, 2009). Climate, centres of origin and range restrictions are the three main factors that determine species distribution.

5.11.1 REPTILES

South Africa has 350 species of reptiles, comprising 213 lizards, 9 worm lizards, 105 snakes, 13 terrestrial tortoises, 5 freshwater terrapins, 2 breeding species of sea turtle and 1 crocodile (Branch, 1998).

Of those 350 reptile species, the Northern Cape is home to 208. According to Reptile Map database the project area is likely to be home to 12 Species (QDS 3122BC, 3122BD, 3122DA, 3122DB)

Consultation of the Animal Demography Unit (ADU) historical records indicates that 62 species of reptiles are likely to occur in the project site. None of these species are conserved under the IUCN and only the Karoo Padlooper *Chersobius boulengeri* is listed as NEAR THREATENED on the National Environmental Management: Biodiversity Act (NEMBA).

5.11.2 AMPHIBIANS

Amphibians are an important and often neglected component of terrestrial vertebrate faunas. They are well represented in sub-Saharan Africa, from which approximately 600 species have been recorded (Frost, 1985). A relatively rich amphibian fauna occurs in the Northern Cape, where a total of 34 species and sub-species occur. Knowledge of amphibian species diversity in the study area is limited. However, according to the Frogmap Database, only two species are likely to occur within Quarter Degree Squares that the project area falls in. (QDS 3122BC, 3122BD, 3122DA,3122DB). Both species are listed as LEAST CONCERN however, all frogs and toads are listed as SCHEDULE II species on the PNCO list and will therefore require permits for their removal.

5.11.3 MAMMALS

Large game makes up less than 15% of the mammal species in South Africa and a much smaller percentage in numbers and biomass. In developed and farming areas, this percentage is greatly reduced, with the vast majority of mammals present being small or medium-sized. The Northern Cape is home to approximately of which the Mammalmap Data base indicates that 21 Species are likely to occur within the project area. Of these 21 species only the Riverine Rabbit *Bunolagus monticularis* is listen as CRITICALLY ENDANGERED. Two other species, the Leopard *Panthera pardus* and the Black-footed Cat *Felis nigripes* are listed as Vulnerable.

5.11.4 AVIFAUNA

The first and second South African Bird Atlas Projects (SABAP1 – Harrison *et al* 1997; SABAP2 – www.sabap2.birdmap.africa) have recorded a combined total of approximately 200 bird species in the broader study area (Appendix 1). These 200 species include: three regionally Endangered species (Ludwig's Bustard *Neotis ludwigii*; Martial Eagle *Polemaetus bellicosus*; & Black Harrier *Circus maurus*); four Vulnerable species (Black Stork *Ciconia nigra*; Verreaux's Eagle *Aquila verreauxii*; Secretarybird *Sagittarius serpentarius*; & Lanner Falcon *Falco biarmicus*); and eight Near-threatened species (Greater Flamingo *Phoenicopterus ruber*; Lesser Flamingo *Phoenicopterus minor*; Karoo Korhaan *Eupodotis vigorsii*; Double-banded Courser *Rhinoptilus africanus*; African Rock Pipit *Anthus crenatus*; Kori Bustard *Ardeotis kori*; Blue Crane *Anthropoides paradiseus*; & Maccoa Duck *Oxyura maccoa*. Approximately 22 of the 200 bird species are endemic or near-endemic, and 68 species are in the top 205 turbine collision risk species identified by Retief *et al*, 2014. Four species are in the top 10 of this priority list: Verreaux's Eagle (#3); Martial Eagle (#4); Black Harrier (#6); and Black Stork (#8). These are likely to be the priority species for the project.

The raptors are probably the most important of the above species due to their proven susceptibility to turbine collisions, and the applicability of species-specific best practice guideline requirements in some cases (to be discussed in more details in the Avifaunal Impact Assessment Report as part of the EIA process). The most important of the raptors at this screening stage are Verreaux's Eagle; Martial Eagle; Black Harrier and Secretarybird. Risk to these species will be highest close to nests.

The large terrestrial species such as Ludwig's Bustard, Blue Crane and Karoo Korhaan are of slightly less concern due to their proven relatively low susceptibility to turbine collisions. Their conservation status does however still warrant attention. These species will typically frequent the flatter parts of site and make use of wetlands, flats, dams, and arable lands.

The closest Important Bird and Biodiversity Area (IBA - Marnewick *et al*, 2015) is approximately 54 kilometres south of the study area, the Karoo National Park IBA. This is too far to have relevance to this assessment at this stage and is not discussed further. It is positive that the proposed project is not in or close to an IBA.

A number of sensitive receptors for avifauna have been identified:

- Dams have been identified as sensitive as they attract various bird species, including perhaps most importantly Blue Crane which roost in flocks in the shallows of dams at night. A buffer of 500m has been placed around all dams identified by the SA NFEPA Wetland layer. Note that although this NFEPA layer is classified as wetlands the ground surveys have revealed that there are a number of man made dams misclassified.
- True wetlands were identified using the NBA2018-Wetlands dataset available on the SANBI BGIS website. This dataset appears to identify true wetlands. At this stage no buffer has been placed around wetlands as we are not familiar with the exact nature of wetlands on this site and their importance for avifauna. Buffers may be imposed later in the project and would likely be similar to those around dams.
- Arable lands are important resources for avifauna for foraging, particularly in winter when the natural veld is dry. We are not aware of a suitable spatial dataset which identifies these areas so they are not mapped at this stage. Fortunately, these areas are mostly close to dams and wetlands and are unlikely to present a significant constraint to development.
- A number of active nests of large priority bird species (Martial Eagle & Verreaux's Eagle) were found on or near site. These nest sites have been afforded spatial protection in the form of No-Go buffers, which have already been considered in the design of the preliminary project layout.

5.11.5 CONSOLIDATED SPECIES OF CONSERVATION CONCERN

The following table is a consolidated list of species of conservation concern which have been observed on the proposed Taaibos South WEF site.

Table 5-2: Species of Conservation Concern, Consolidated Table (as per avifaunal and ecological specialist screening).

SCIENTIFIC NAME	FAMILY	STATUS[1]	COMMENT/PRESENCE
MAMMALS			
Bunolagus monticularis (Riverine rabbit)	Lagomorpha	CR, NEST (H, M)	Usually confined to dry riverbeds areas having riparian shrubby vegetation or on the narrow alluvial fringe of seasonally dry watercourses in the Central Karoo. **Riverine Rabbit Study is being undertaken**
Felis nigripes (Black Footed Cat)	Felidae	ToPS, CITIES 1,	Camera trap record confirmed presence near the western edge of the Taaibos site. Approximately 1.5 km from a DFFE designated high sensitivity area (outside project footprint). Recommend a buffer around this area, as it may be within foraging range if the nearby high sensitivity area is a known den. Further investigation required as part of the Ecological Impact Assessment.

SCIENTIFIC NAME	FAMILY	STATUS[1]	COMMENT/PRESENCE
			Terrestrial Biodiversity (Ecological) Impact Assessment is being undertaken.
BIRDS			
Aquila verreauxii (Verreaux's Eagle)	Accipitridae	VU, NEST (H, M)	**Avifaunal Monitoring and Impact Assessment is being undertaken.**
Neotis ludwigii (Ludwig's Bustard)	Otididae	EN, NEST (H, M)	
REPTILES			
Chersobius boulengeri (Karoo Padloper)	Testudinidae	NEST (M), ToPS	Widespread and likely to occur sporadically throughout the site. May require taxa specialist input but this species is expected to be found throughout the broader area. **Terrestrial Biodiversity (Ecological) Impact Assessment is being undertaken.**
AMPHIBIANS			
None of Concern			Further investigations will be required, but higher risk areas include riparian and watercourse areas which will be indicated as areas to avoid. **Terrestrial Biodiversity (Ecological) Impact Assessment and Freshwater Impact Assessment are being undertaken.**
INVERTEBRATES			
Orthoptera (Grasshoppers)			
None of Concern			
Lepidoptera (Butterflies)			
None of Concern			
Scorpions and Spiders			
Baboon Spiders & Scorpions		ToPS	Various species likely present **Terrestrial Biodiversity (Ecological) Impact Assessment is being undertaken.**

5.12 RIVERS, WATERCOURSES AND DRAINAGE LINES

5.12.1 NFEPA WETLANDS AND RIVERS

After several years of development and testing, a National Wetland Classification System (NWCS) was completed in 2013. The South African National Biodiversity Institute (SANBI), through its National Wetland Inventory project, initiated a collaborative process to develop a classification by which wetland habitat types with shared natural attributes can be grouped together. The classification system is intended to be used throughout the country for a number of different applications, with a view to provide wetland specialists, academics, government and other role players with a common language when distinguishing different types of wetlands for management and conservation purposes. The National Wetland Inventory maps are provided by SANBI through National Freshwater Ecosystem Priority Area (NFEPA) wetland maps, which classify the major wetlands and water bodies in the country at a coarse spatial scale. The classification was applied to the wetlands included in the inventory's National Wetland Map after extensive field testing throughout the country and through the National Freshwater Ecosystem Priority Areas (NFEPA) project. Please refer to Figure 5-7 for a map illustrating the NFEPA Wetlands and Rivers.

According to the NFEPA a number of wetlands were found to occur within 500 m of the project boundary. No rivers are found to occur within 32 m of the project area, but numerous drainage lines will be impacted by the proposed Taaibos South WEF. Water Use Licences (WUL) will have to be obtained from DWS prior to the commencement of any construction activity within this area.

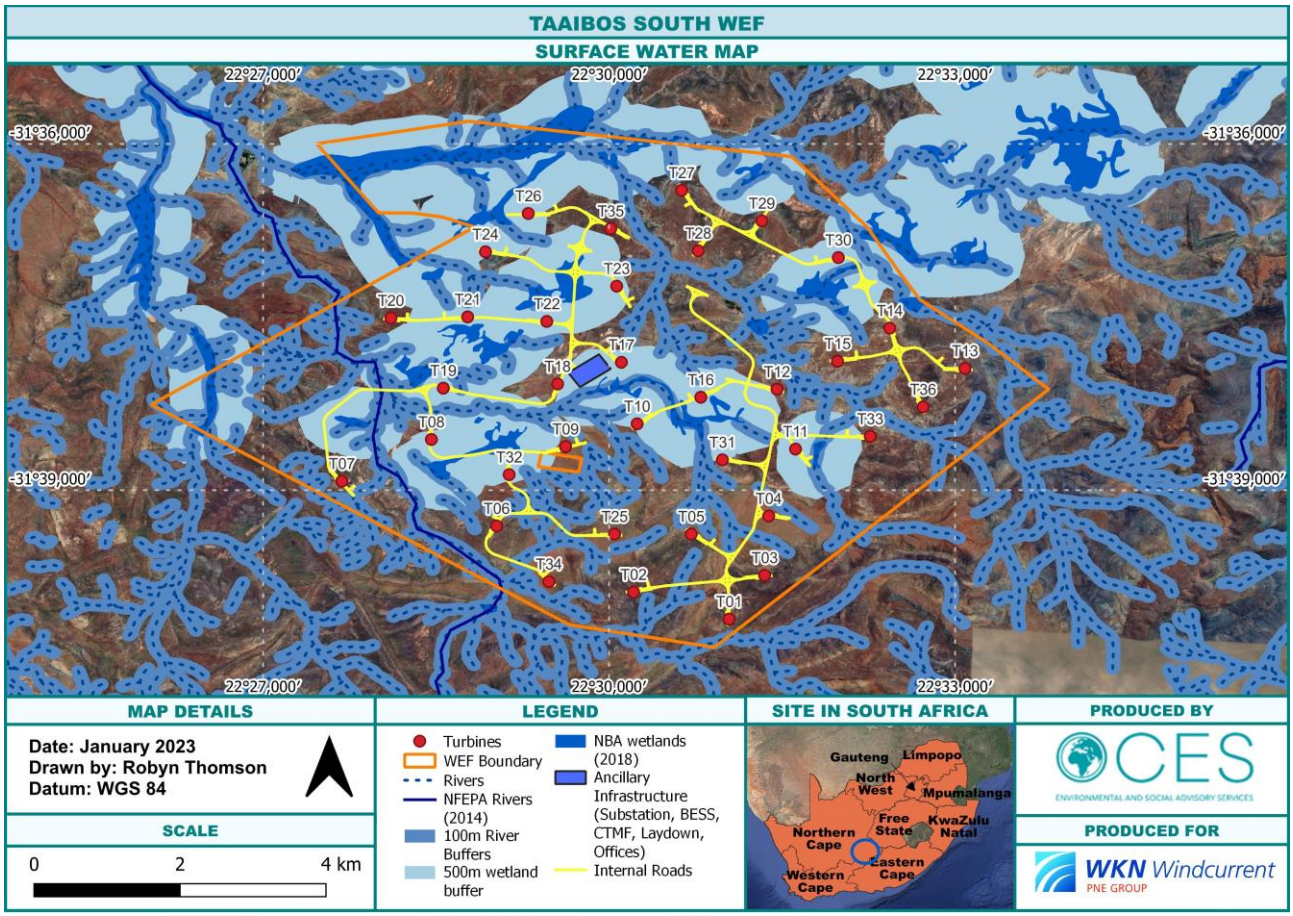

Figure 5-5: Surface Water Map of the Taaibos South WEF site and surrounding areas.

The following main wetland types are found within the project boundary (these wetlands will be assessed in the Freshwater Specialist Report:

A) SLOPE SEEP

An inclined stretch of ground that is not part of a valley floor, typically located on the side of a mountain, hill or valley. A slope seep is a wetland area located on gently sloping land dominated by the gravity driven movement of material down-slope. Seeps are generally associated with strong, unidirectional flow of water horizontally. Water input is primarily groundwater or precipitation.

B) VALLEY FLOOR: CHANNELLED VALLEY-BOTTOM WETLAND

Small depressional areas within a channelled valley-bottom wetland can result in the temporary containment and storage of water within the wetland. Water generally exits in the form of diffuse surface flow and interflow, with the infiltration and evaporation of water from these wetlands also being potentially significant

Water bodies play an important ecological role which is associated with the vegetation that is found to occur in these areas, this vegetation plays a role in the improvement of the water quality and the trapping of sediment (Daily,1997). Bulrushes said to be generally beneficial species as they play a role in controlling erosion and filtering mudding floodwaters (Bromilow, 2010).

The maintenance of these water bodies is important as it provides suitable habitat for hydrophytic (water loving) vegetation and riparian vegetation found to occur in the wetland area.

C) VALLEY FLOOR: UNCHANNELED VALLEY-BOTTOM WETLAND

Similar to the Channelled Valley-Bottom as described above but differs in that there is an absence of any distinct channel banks flowing through the wetland and the resulting prevalence of diffuse flows. The inputs for this type of wetland are typically from upstream channels or seepage from adjacent valley side slopes.

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6 DESCRIPTION OF THE ENVIRONMENT: SOCIO-ECONOMIC

6.1 DESCRIPTION OF THE SOCIO-ECONOMIC PROCESS FOR RENEWABLE ENERGY PROJECTS

The Department of Mineral Resources and Energy's ("DMRE's") Renewable Energy Independent Power Producers Procurement Program ("REI4P") implements certain measures to ensure that a portion of the income generated through operational Renewable Energy ("RE") projects is directed towards local economic development. In order to select winning bids, the DMRE uniformly ranks all projects submitted according to a scorecard in which (i) 70% of the score is based on the proposed energy Tariff of the respective projects; and (ii) 30% of the score is based on the Economic Development ("ED") commitments made by the respective projects on the following seven (7) elements:

- Job Creation: Employment of South African Citizens, Black People, Skilled, Unskilled and people residing in the local communities where the project is located;
- Local Content: Components of the facility/project manufactured in South Africa;
- Preferential Procurement: Goods and services procured through South African companies that have a B-BBEE Generic scorecard or who are Qualifying Small Enterprises, Exempt Micro Enterprises and Woman Owned Venders;
- Black Ownership: The percentage of Black Ownership in the project;
- Black Top Management: Senior management that are Black people from the Independent Power Producer within the project;
- Enterprise Development: the monetary rand contributions made towards Enterprises in the local communities as a percentage of the revenue; and
- Socio-Economic Development: the monetary rand contribution made towards socio-economic challenges in the local communities as a percentage of the revenue.

The minimum criteria required for each of these elements do not always stay stagnant and are from time to time adjusted prior to each bidding window commencing.

Jobs and the inflow of funds to the local communities do not occur at once, as the process is staggered. During the bid development phase few project developers liaise with communities and cannot commit to promises in terms of local benefits, as the outcomes of the project proposals are uncertain. In the case of a preferred bidder, and during financial close, consultation will commence and construction will result in the employment of workers. Once operational, SED and ED spent will usually increase.

The Independent Power Producer ("IPP") projects of the first five (5) bid windows (BW1, BW2, BW3, BW3.5, BW4) were distributed across all nine (9) provinces. Up to date, in the Northern Cape Province, the following economic investments and positive socio-economic impacts have been committed (IPPPP Overview, 31 December 2021):

- 48 projects, contributing 3 566 MW (compared with 17 projects in the Eastern Cape; and 11 in the Western Cape);
- Investment (equity and debt) to the value of R139 billion;
- Created 65 249 job-years for South African citizens to date;
- SED and ED contributions of R14 402 million; and
- Shareholding by South African entities and Black South Africans of R15 133 million.

6.1.1 IDENTIFICATION OF THE BENEFICIARY COMMUNITY

The first step for project developers is usually to identify local communities that will benefit from the renewable energy project. Requirements of the renewable energy independent power producer procurement (REIPPP) programme oblige renewable energy companies to engage with the developmental opportunities and needs of communities around their project sites. The procurement documents define local communities as settlements in a 50km radius around the project site. It is usually the responsibility of the project developer to decide what constitutes the benefitting community. This could be specific villages or towns, or even the entire (qualifying) population within the 50km radius.

6.1.2 FINANCIAL AND SOCIO-ECONOMIC CONTRIBUTIONS

The IPP will ensure community ownership and social responsibility as follow:

- **Community trust**: The mechanism established for the community to hold ownership of projects, which aims to ensure that a portion of the income generated is directed towards local economic development. At this stage at least 2,5% equity should be held by communities.
- **Employment**: The employment requirement ensures that at least 20% of the South African workforce in the Project comes from the local communities. During the construction phase direct benefits therefore mainly pertain to construction related employment opportunities and procurement as well as induced impacts that relate thereto.
- **Socio-economic development ("SED") and Enterprise development ("ED")**: SED contributions are allocated towards activities that facilitate sustainable access to the economy for beneficiaries in the areas of rural development, the environment, infrastructure, enterprises, reconstruction of undeveloped areas, development programmes for women or youth, education, health care, arts and culture. ED refers to contributions to black-owned businesses with the specific objective of assisting or accelerating the development, sustainability and ultimate financial and operational independence of that enterprise. Currently, the target set by the Department in the last version of the tender documents was 2.1% of revenue.

6.2 STAKEHOLDERS FOR THE SOCIAL ASSESSMENT OF THE TAAIBOS SOUTH WEF

Stakeholders within the primary and secondary spheres of influence are identified throughout the public participation and SIA processes. The sphere of influence is determined by the degree of impact that will potentially manifest. Geographic location of the stakeholder can aid the categorisation but does not necessarily award a higher level of impact to a stakeholder that is located in closer proximity to the project. Stakeholders that have been identified thus far as relevant to the SIA include:

- PRIMARY SPHERE OF IMPACT
  - Land owners
  - Ward Councillors
  - Ubuntu Local Municipality

- SECONDARY SPHERE OF IMPACT
  - Adjacent and surrounding landowners
  - Pixley Ka Seme DM (PKSDM)
  - Road users on public and access roads
  - Fire and rescue services
  - Legitimate land claimants, if any

- Agricultural unions

- INDIRECT IMPACT SPHERES
  - Labour unions
  - South African Police Service

6.3 BASELINE INFORMATION OF THE STUDY AREA

6.3.1 UBUNTU LOCAL MUNICIPALITY

Ubuntu LM is located on the border between the Northern and Western Cape on the Southern Edge of the Pixley Ka Seme District Municipality. The seat of the LM is in Victoria West, the largest town in the municipality. Two other towns, Loxton and Richmond as well as two railway villages Hutchinson and Merriman make up the only other major developed areas within the municipality. (www.localgovernment.co.za)

In 2011 the Ubuntu LM census put the population for the entire region as 18 601 over an area of 20 389.23 km². The population of Victoria West was the largest in the region at 8 254.

Agriculture forms the key economic activity within the greater Pixley Ka Seme District Municipality and according to the Pixley Ka Seme District Growth and Development Strategy the Municipalities of Ubuntu, Siyathemba and Siyacuma contribute the most to this sector, with a total of 28,49% contributed to the provincial Gross Geografic Product. This underlines the key importance of Ubuntu LM with regards to the economic growth of the District.

The northern portion of the Ubuntu Local Municipality is located in the Renewable Energy Hub that was identified by the Northern Cape Spatial Development Framework. The purpose of which is to provide a special economic zone that will support the development of alternative energy sources to stimulate economic growth and development. (Pixley Ka Seme SDF 2014)

6.3.2 DESCRIPTION OF THE STUDY AREA AND LAND USES

The Ubuntu LM is divided up into 4 Wards. The study area is located in Ward 3, the largest ward with an area of 16 891km². As expected, agriculture forms the largest land use in this sector. This will be expanded on in the Socio-economic Specialist Report and in the Agriculture & Social Impact Assessment Report.

6.4 KEY DEMOGRAPHIC INFORMATION

6.4.1 POPULATION SIZE

Census 2011 determined the Pixley Ka Seme population to be 203 788 throughout an area of 103 410km². This puts the population density of the district at 1.9 persons/km². Despite the very low population density the district contributes 16.4% to the total population of the Northern Cape. The district is characterised by low-income households with high levels of unemployment. It has been noted that Pixley Ka Seme DM has been plagued by mismanagement of funds over the past years (Pixley Ka Seme IDP 2022-2027). Despite this

the DM is considered to be in a very favourable position, with major river systems and various national routes passing through. These provide a potential source of income into the area via different avenues.

Ubuntu LM is the largest of the eight municipalities that make up the district, accounting for almost a quarter of its geographical area. Of the estimated 58 975 Households in the Pixley Ka Seme DM Ubuntu contributes 5 950. With its population size of 18 601 the LM also contributes only about 9% to the district's population with the majority being found in the three major centres.

6.4.2 Population Growth

The Ubuntu LM population increased from 16 375 in 2001 to 18 601 in 2011, indicating a 1.6% growth per annum and an 11.9% population growth over the 10-year period. The growth rate for this LM is well below the average national population growth of 35.7% from 2001 to 2011. According to the Ubuntu Local Municipality Draft IDP 2022/2023 the growth rate of LM moving forward will depend on the economic opportunities that the municipality has to offer. Young adults have been identified as a priority group due to their propensity to migrate away for better employment opportunities. A local stagnating economy that cannot provide qualified school learners with suitable job opportunities will result in the loss of these economically active adults to areas with better opportunities.

6.4.3 Age and Gender

The age and sex structure of the population is a key determinant of population change and dynamics. The shape of the age distribution is an indication of both current and future needs regarding educational provision for younger children, health care for the whole population and vulnerable groups such as the elderly and children, employment opportunities for those in the economic age groups, and provision of social security services such as pension and assistance to those in need.

The age and sex structure of smaller geographic areas are even more important to understand given the sensitivity of small areas to patterns of population dynamics such as migration and fertility. An increase in the young and the economically active population (EAP) of a LM would thus mean the potential increase in income earnings, however the growth would place pressure on educational resources and job opportunities as there is the possibility for smaller and slower growing economies to provide work to the increasing population.

The Local Municipal sex ratio is an even split of 50/50 Males to Females. (Community Survey 2016: Statistics South Africa) The Community survey also indicated that the Median age of the LM was 25 (as opposed to Pixley Ka Seme which is 26). 24% of the population is between the ages of 10-19 which is about 20% higher than the overall Pixley Ka Seme DM.

When the local statistics of Ubuntu are compared with the age breakdown of the District and Provincial data (Figure 6-1), it is evident that Ubuntu has a slightly larger younger population than the district or provincial areas. As such the population of 18-64 year olds is smaller than that of the greater area.

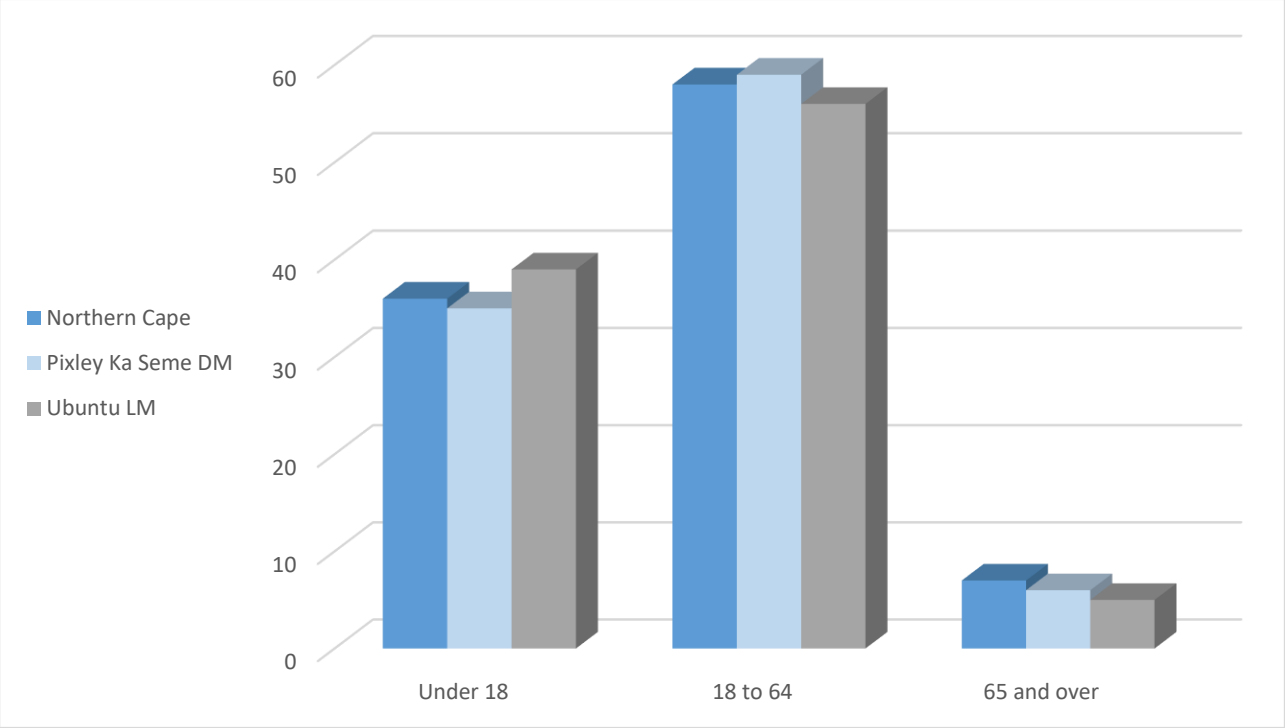

Figure 6-1: Age Range of Provincial, DM and LM.

This again emphasises the importance of education, sport and recreation for youth development in the area if the LM is to experience economic growth in the future.

6.4.4 Race and Language

The largest proportion of the population within the Ubuntu LM are Coloured which represents 73% of the population. This is 1.5 times the population proportion of the Northern Cape. This is followed by Black Africans representing 23% and Whites at 4%. The most popular languages spoken in the Municipality are Afrikaans (83%) isiXhosa (13%), and then English and Sesotho at 1%. (Ubuntu IDP 2022/2023)

6.5 Economic Background

6.5.1 Unemployment Rate and Employment Status

Employment status refers to whether a person is employed, unemployed or not economically active. The official unemployment rate thus gives the number of unemployed as a percentage of the labour force. The labour force in its turn is the part of the 15–64-year population that's ready to work and excludes persons not economically active (scholars, housewives, pensioners, disabled) and discouraged work-seekers. It is worth noting that, in South Africa, high unemployment coincides with low economic growth.

The Northern Cape Province has an overall unemployment level of 32.4 % and youth unemployment level of 42.4%. (Regional Profile Youth Employment Northern Cape 2015). This is considerably higher than the overall official unemployment rate for South Africa which is at 25.5%.

The Pixley Ka Seme DM has an unemployment rate of 28.3% with a youthful unemployment rate (15yrs-34yrs) of 35.4%. The Ubuntu Local Municipality has an overall unemployment rate of 29.1 % as of 2011. This is down from the 34.1% recorded in 2011. While the youthful unemployment rate is at 34.8%, down from 41.5% in 2001. (Ubuntu Municipality IDP 2022/2023)

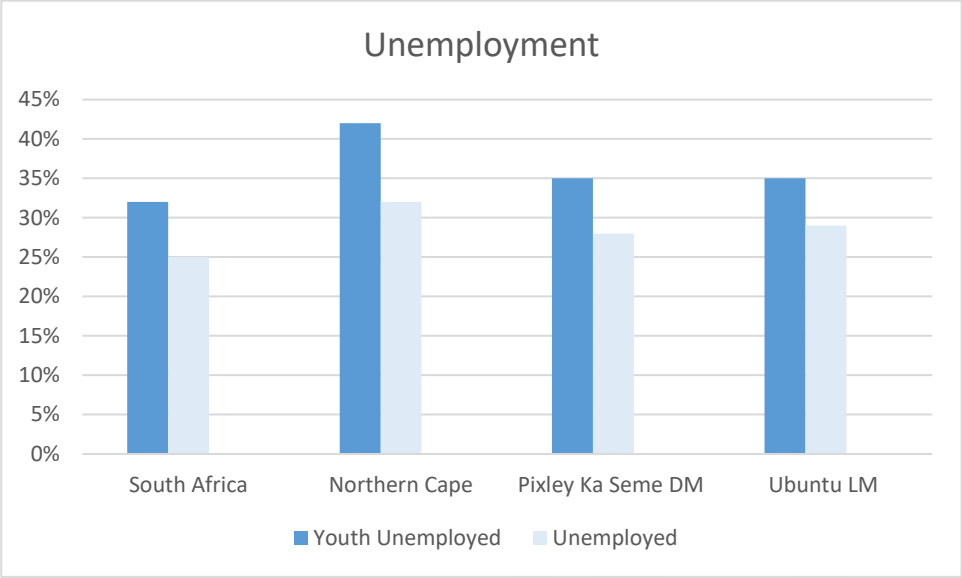

Figure 6-2: Youth Unemployment Percentage of RSA, NC, DM and LM

6.5.2 INCOMES

Annual household incomes for The Northern Cape, Pixley Ka Seme DM and Ubuntu LM are compared in the figure below.

Overall, the income levels of Ubuntu LM are below that of the larger District and Province (Census 2011). According to the 2011 Census as well as the Ubuntu Municipality IDP 9% of the local Municipal population (individual income) earn no income, and 5% earn less than R400 per month. The majority of the local population earn between R833 – R1 666 per month (31%). Only 6% earn more than R12 500 p/m.

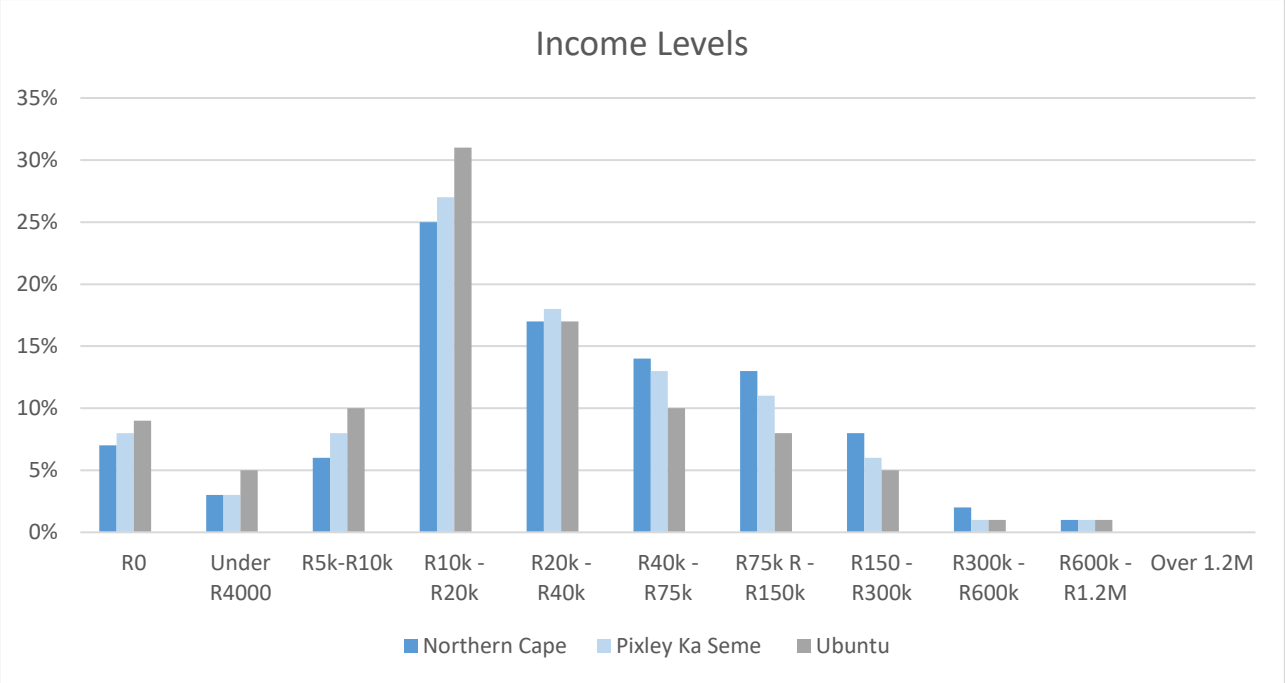

Figure 6-3: Income Level of the Northern Cape, Pixley Ka Seme DM and Ubuntu LM.

6.5.3 Economic Sectors & Employment

The Northern Cape has the smallest population and economy of any of the provinces. With 1.2 million residents, the Northern Cape accounted for only 2% of South Africa's population in 2014/2015, and contributed a similar share of the GDP. As of 2020 the largest sector for employment in the Northern Cape Province was the community and social services sector which accounts for 34.3% of the labour market in the Province. Thereafter, most employment opportunities were offered within the trade sector (14.8%), finance (12.2%) and mining (10%). Utilities accounted for the smallest share of people employed along with transport. (NC Socio Economic Review and Outlook 2021).

Pixley Ka Seme DM's major employers are community and social services (32%), trade (18%), which includes retail and tourism, followed by Agriculture (15%). Electricity/Utilities account for 1% of total employment in the District (NC Socio Economic Review and Outlook 2021).

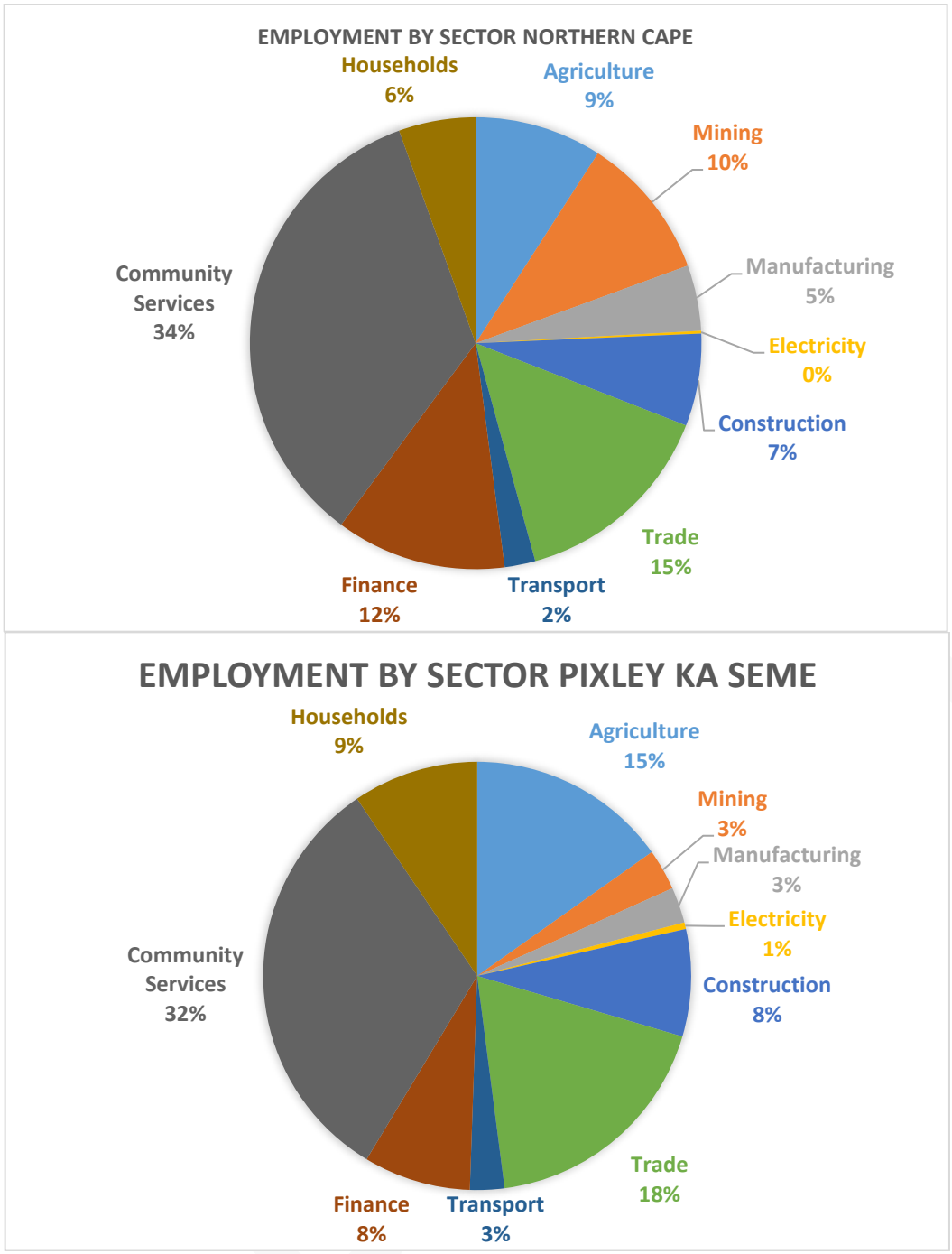

Figure 6-4: Employment Sectors of the Northern Cape and Pixley Ka Seme DM (NC Socio Economic Review and Outlook 2021).

Unlike the Greater Province and District, Ubuntu LM's economic sectors are dominated by trade and Agriculture. Construction, transport and finance are the next largest contributors.

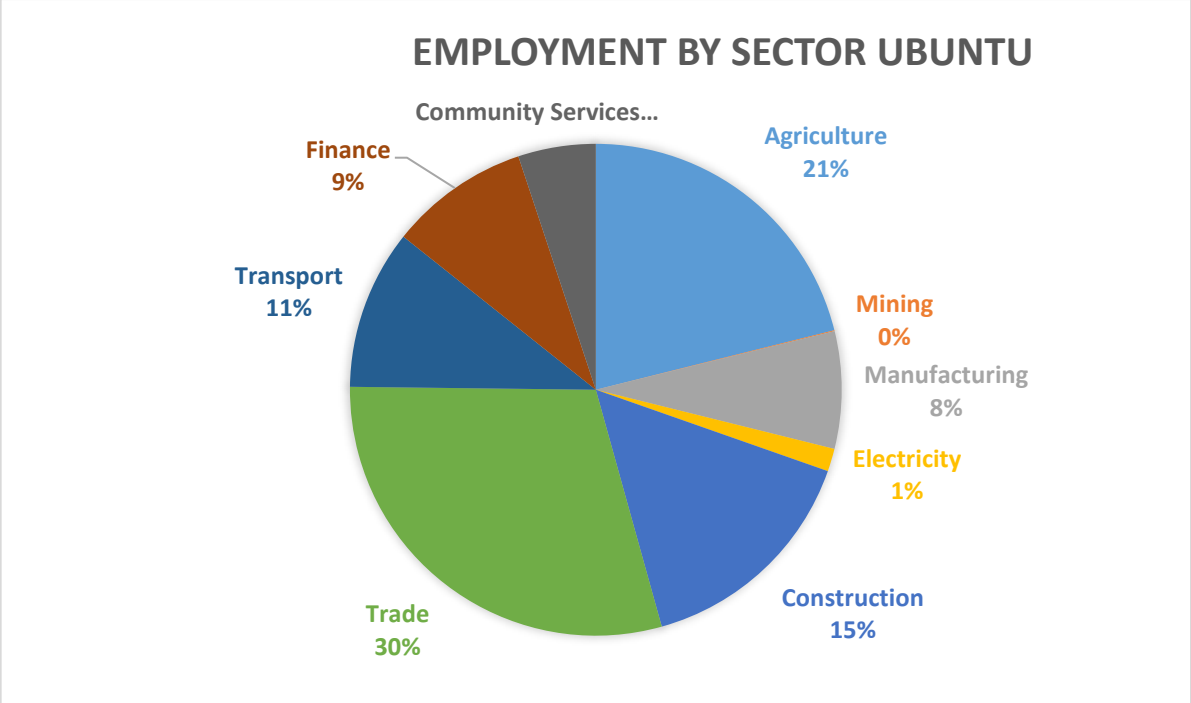

Figure 6-5: Economic Sectors of Ubuntu LM.

6.5.4 Economic Development

As of 2018 the Pixley Ka Seme DM has a GDP of R 12.3 billion which is up from R 6.71 billion in 2008. The DM contributed 12.46% to the Northern Cape Province GDP of R 98.6 billion in 2018 increasing in the share of the Northern Cape from 12.27% in 2008. Overall, the Pixley ka Seme District Municipality contributes 0.25% to the GDP of South Africa which had a total GDP of R 4.87 trillion in 2018 (as measured in nominal or current prices). It is expected that Pixley ka Seme District Municipality will grow at an average annual rate of 0.15% from 2018 to 2023. The average annual growth rate of Northern Cape Province and South Africa is expected to grow at -0.03% and 1.50% respectively. The Pixley Ka Seme District Development Model 2018 identified three main sectors with regards to the main drivers of the economy which are discussed below.

A) Primary Sector

The primary sector consists of two broad economic sectors namely the mining and the agricultural. Between 2008 and 2018, the agriculture sector experienced the highest positive growth with an average growth rate of 14.3%. The mining sector reached its highest point of growth of 8.7% in 2013. The agricultural sector experienced the lowest growth for the period during 2011 at -12.6%, while the mining sector reaching its lowest point of growth in 2009 at -11.8%. Both the agriculture and mining sectors are generally characterised by volatility in growth over the period.

B) Secondary Sector

The secondary sector consists of three broad economic sectors namely the manufacturing, electricity, and the construction sector. In 2010 the manufacturing sector experienced the highest positive growth with a growth rate of 7.6%. The construction sector reached it s highest growth in 2009 at 11.8%. The electricity sector experienced the highest growth in 2018 at 2% while it recorded the lowest growth of -5.7% in 2013.

C) Tertiary Sector

The tertiary sector consists of four broad economic sectors namely the trade, transport, finance and the community services sector. The trade sector experienced the highest positive growth in 2010 with a growth

rate of 4.3% while the transport sector reached its highest point of growth in 2008 at 3.9%. The finance sector experienced the highest growth rate in 2008 when it grew by 5.9%. With regards to the community services sector the highest positive growth was experienced in 2008 with 6.6%.

INDEPENDENT POWER PRODUCTION PROJECTS

The Northern Cape is in a very favourable position with regards to being able to contribute to South Africa's renewable energy development. According to The Green Document as of 2018 the Northern Cape is host to 59 of the country's 112 Independent Power Producers, the most out of all the provinces.

Of the 59 projects in the Northern Cape, Photovoltaic Solar contributes approximately 43% with wind only marginally less at 40%. The remaining 17% is contributed by Concentrated Solar Power. The combined projects are responsible for a total of 3621 MW online (this excludes projects that are in early operations) with 5 592Gwh generated. (IPP Quarterly Report, December 2016). In addition to renewable energy power production and the offset of CO_2 emissions, far-reaching socio-economic advantages manifest. These include procurement, enterprise development, employment creation, local equity and socio-economic development for local communities.

The IPP Quarterly Report for Northern Cape Province states that the committed procurement spent in the Province, during both construction and production, amounts to R 134.1 billion which equates to 66% of the country total. Of this, R44.7 billion (33%) has been realised. Employment remains a top priority in the Northern Cape as with the rest of South Africa. IPP investments within the Province alone have contributed to new employment opportunities for SA citizens estimated at more than 68 000 job years over the construction and operational life of the projects. This is 60% out of the total country when it comes to IPP generated job opportunities and again highlights the strategic position of the Northern Cape with regards to Renewable energy projects.

Socio-economic development (SED) and economic development (ED) expenditure under the IPPPP are focused on education and skills development, social welfare, healthcare, general administration, and enterprise development. An important focus of the IPP is to ensure that the build programme secures sustainable value for the country and enables local communities to benefit directly from the investments attracted into the area. This falls under the Socio-economic development (SED) contributions. These are focussed in five main categories; namely, education and skills development, social welfare, healthcare, general administration, and enterprise development.

6.6 SOCIAL STATUS

6.6.1 EDUCATION

Persons with no schooling are defined as people who never received any form of formal education. This implies illiteracy in most cases and would limit the person to perform manual labour. The importance of education is emphasized, as the education levels of a population is directly linked with that population's level of employability.

There have been positive improvements on district and local level, with the decrease in the percentage of the population that has not received schooling. A high level of dropouts, especially at primary education level, remains.

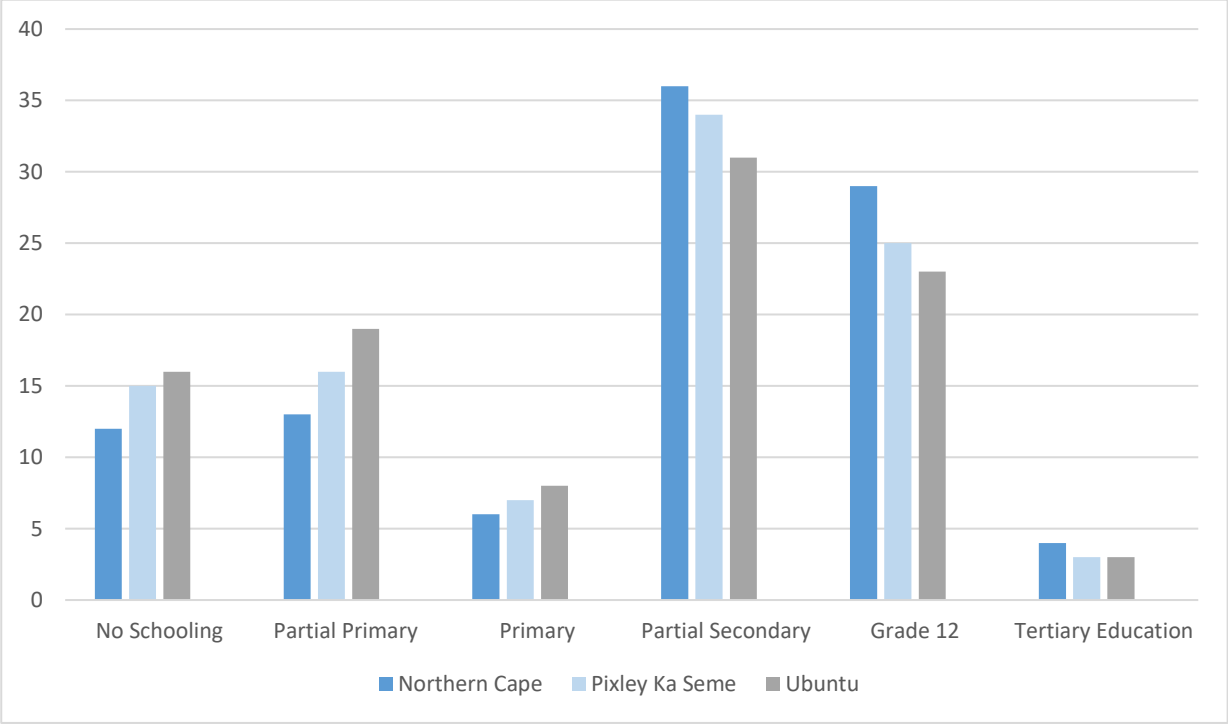

Figure 6-6: Education Levels in the Province, DM and LM

In the Ubuntu LM, Census 2011 statistics show that the level of people with no education decreased from 30.6% to 16.4%. The number of Matriculants has also increased from 12.2% to 18.7%. While this is a positive trend the number of people with no education and people without a Grade 12 certificate remains a concern.

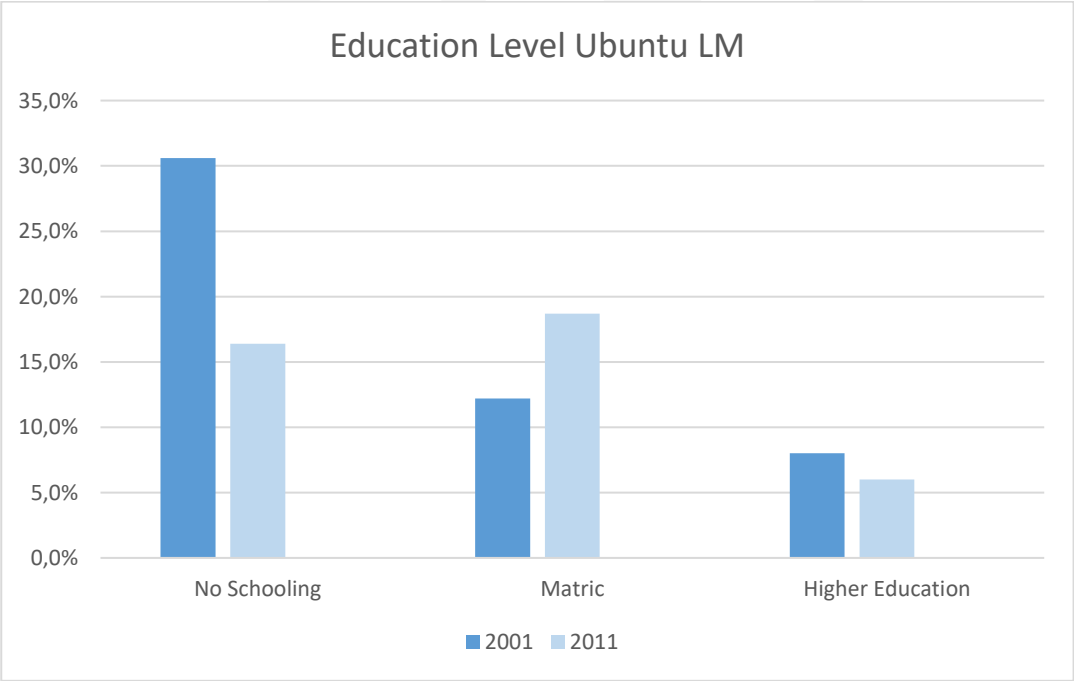

Figure 6-7: Education Levels in the Ubuntu Municipality 2001 and 2011.

Conversely, the number of people completing secondary school and receiving a tertiary education has actually decreased by a small margin.

6.6.2 Dependency, Inequality and Poverty Levels

Poverty is defined not only by levels of unemployment, but also characterized by a lack of access to education, health care, and basic services including water and sanitation.

In the Pixley Ka Seme DM, as of 2019, 35.3% (77 953) of the population were living below the poverty line. (Pixley Ka Seme District Municipality District Development Model 2019) This is 5.9% higher than the 73 650 recorded in 2009.

6.6.3 Crime

Crime in South Africa is known to negatively affect investment and growth which in turn harms employment opportunities. While crime levels in the Pixley Ka Seme DM and the Ubuntu LM are relatively low compared to the rest of the country (Ubuntu LM IDP 2022) the threat of crime is still an ongoing issue within the region. Crime and crime prevention diverts resources to protection efforts and exacts health costs through increased stress and untimely creates an environment not conducive to productive activity. The Pixley Ka Seme DM is not immune to this country wide issue and recent statistics have shown the increased levels of substance abuse, gender based violence and violent crime. (Pixley Ka Seme IDP 2021/2022)

It has also been noted that a decrease in job opportunities can lead to an increase in local criminal activities. Residential Burglaries has shown a steady increase in all the region over the past six (6) years which is of growing concern. Similar patterns are evident towards business burglaries, assault as well as murder. Murder rates have shown a slight decrease in 2020 which could also be due to lockdown restrictions. The declining mining sector in the province has been noted as a cause for the high crime statistics. This again reiterates the need for economic growth and job opportunities to prevent or at least lower the problems faced by communities.

6.7 Housing, Infrastructure and Services

6.7.1 Housing

As of the 2016 Community Survey there are an estimated 6034 Households in the LM which makes up approximately 10% of the entire DM (Pixley Ka Seme DM total households 56 308). Of these 6034 households 5457 (90%) are formal dwellings while 399 (6.6%) are informal dwellings. The percentage of informal dwellings in the LM is below that of both Pixley Ka Seme (9.92%) and the Northern Cape (12.79%).
The 2016 Survey also showed that 68.8% of the total households in the LM are fully owned or currently being paid off.
According to the Ubuntu Municipalities latest Housing plan there is a current housing backlog of 1850. As such the LM has instigated a Municipal Housing issue programme focusing on 4 main areas.

- Rural Housing
- Urban Housing
- Rental Housing
- Capacity Building

Major Challenges pertaining to housing and settlement aspects within the Local Municipality include

- The non-availability of the land to address current housing demand, available land is owned by private owners which are intensively used mainly for agriculture, SAN Parks and state land;

- The availability of Bulk Services. This is one of the key priorities for the proposed housing projects. This will require close co-ordination with the District Municipality to ensure funding for proposed projects. One strategy proposed within the Housing Plan would be to request the District Municipality to provide a full analysis of existing and proposed bulk services.

6.7.2 SERVICES

A) BULK SERVICES / WATER

Access to safe water is a fundamental human need and plays an important role in socio-economic development. South Africa is classified as a "Water Stressed" Country and as such the availability of water for the local population is an ongoing concern. Pixley Ka Seme DM has a total of 28 200 (49.27%) households with piped water inside the dwelling, 25300 (44.25%) inside the property boundary and a total number of 636 (1.11%) households without any formal piped water source. (Pixley Ka Seme IDP 2018)

The Ubuntu Local Municipality is both the 'Water Service Authority' and 'Water Service Provider' and is also responsible to provide all the other local government services such as municipal roads, storm water management, electricity, waste collection and disposal. Of the 5958 formal dwellings in the LM as of 2018 the number with piped water inside the dwellings was 2970 (49.8%), Piped water in the property line 2770 (46.4%) and those with no formal piped water 218 (3.6%).

B) HOUSEHOLD SERVICES

Increase in service delivery and the development/upgrading of bulk infrastructure should have a positive impact on economic growth thereby increasing possibilities to attract new business opportunities. According to the Ubuntu IDP 2018/2019 Electricity is in good supply throughout the Municipal area. However there are still some issues that have been identified.

The identified issues are:

- The need to upgrade the old electricity network in Victoria West, Richmond and Loxton
- Addressing of street lightning and area lightning in all towns
- Electrification of households in Merriman
- Upgrading of electricity network in Loxton
- Load shedding remains a core challenge for development
- Addressing problems with vendors in Eskom distribution areas
- The rapid increase in electricity tariffs
- Electrification of the new developed sites
- Continuous interaction with ESKOM with regards to their areas of supply within the Municipal areas

In terms of electricity supply to formal dwellings in the Ubuntu Municipality the graph below shows the availability in the LM in comparison to the wider DM and Province. While the proportion of In-House prepaid electricity is greater in the LM the percentage of dwellings with no access remains around 7% which is in line with the greater area.

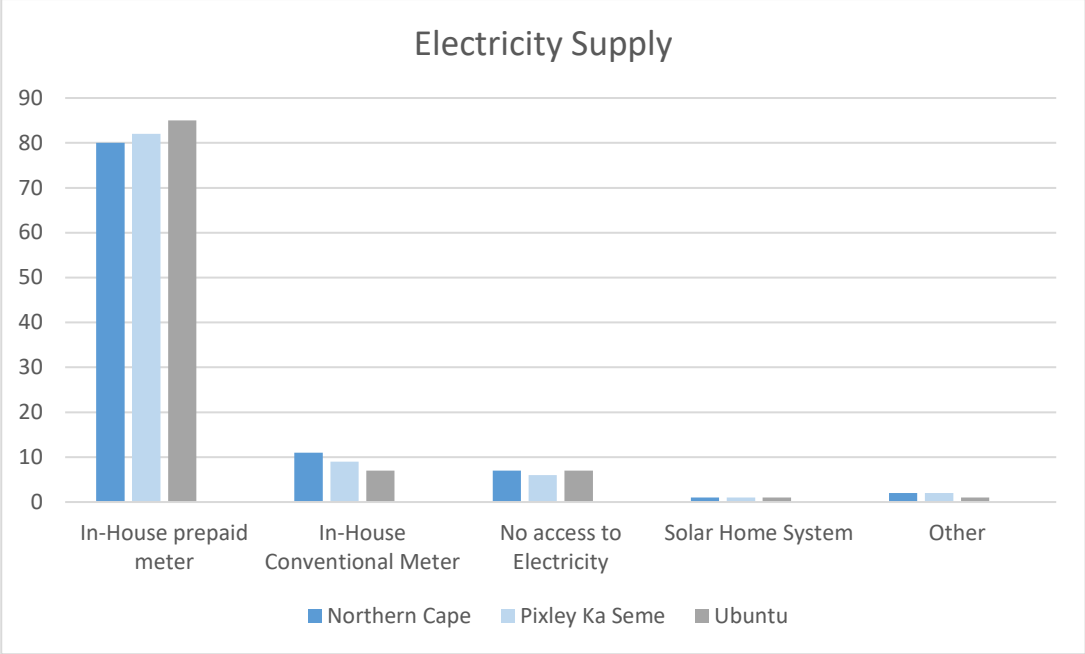

Figure 6-8: Electricity supply with the Province, DM and LM.

In Ubuntu LM, the number of households with flush toilets connected to the sewage network stood at 3303 in 2011. This number has grown to 5250 as of 2018. This is an increase of 37% over the period of 7 years. However there remains over 302 dwellings without any form of sanitation.

In 2016, 83.2% of households had access to a weekly refuse removal service as opposed to 65% experienced in the Northern Cape. However 3% of the households have no formal means of refuse removal.

6.7.3 Landfill Sites

Ubuntu municipality has three unregistered landfill sites that situated are in the main urban centres of Richmond, Loxton and Victoria West. The sites are managed by the Municipality but due to financial and personal constraints the sites have a history of mismanagement. (Integrated Waste Management Plan Ubuntu LM 2017) As part of the ongoing upgrading of services the LM has conducted feasibility studies for the construction of a new landfill site in Victoria West and Loxton along with the intention of upgrading the current existing sites.

6.7.4 Community Safety

The crime rate in the Ubuntu LM is low in comparison to the rest of the country, however there are still issues in the community with regards to safety and security. The Main SAPS office for the region is located within Victoria West. In total there are 3 Police Stations, 2 Magistrates Courts and 2 District courts as can be seen in the table below.

Table 6-1: Safety and Security Facilities.

Town	Police Station	Magistrates Court	District Court
Victoria West	1	1	1
Richmond	1	1	1
Loxton	1	-	-
Total	**3**	**2**	**2**

6.7.5 Health Services

Health services are now provided by the Department of Health. There are 3 Clinics and 2 Hospitals in the Municipality (both with ambulance services). The 2022 Ubuntu IDP has identified the following issues that still need to be addressed with regards to the Health Services in the Municipality.

- Inadequate health facilities within close proximity to the population
- Limited professional medical staff (Doctors & Nurses)
- Limited specialist equipment
- Underutilized facilities
- Shortage of ambulances

Table 6-2: Health Care Facilities.

Town	Clinic	Hospital	Ambulance Service
Victoria West	1	1	Yes
Richmond	1	1	Yes
Loxton	1	-	-
Total	**3**	**2**	**2**

6.7.6 Educational Facilities

There are 12 Primary Schools, 3 High Schools, 7 Pre-schools and no Tertiary Education facilities within the Ubuntu LM. Although the latest census showed that the proportion of citizens with No Education had dropped between 2001 and 2011 the latest IDP has identified the high level of illiteracy as an ongoing issue. This is in part due to the relative lack of education facilities (as well as the lack of teachers). A push to recruit additional teachers as well as to develop additional education facilities has been proposed.

6.7.7 Road Network

In the Pixley Ka Seme DM approximately 72% of the 984km of roads are gravel or unpaved, posing financial and human resources challenges, as gravel roads require a structured maintenance programme. Only 21% are tarred. In the Ubuntu LM approximately 78% of the roads are unpaved and around 20% are tarred. (Pixley Ka Seme IDP 2022-2027)

The project site is located to the South of the R63 between Victoria West in the East and Loxton in the West.

Other important road links in Ubuntu LM are:

- The N12 links Three Sisters in the South to Victoria West in the North.
- The R381 links Beaufort West in the South to Loxton in the Nort.
- A Short portion of the National Route N1 passes through the LM near Three Sisters.

6.8 Land Reform Programmes

The Land Reform Programme was developed to promote land acquisition, restore land rights lost through dispossession and achieve tenure upgrade. The Ubuntu IDP 2017 states that A Land Usage Plan is a priority issue moving forward and as a priority mor land needs to be identified for use by emerging farmers.

The issues identified in the IDP to be addressed are as follows:

The identified issues are:

- More land for emerging farmers / land reform
- Skills training for emerging farmer and youth
- Upgrading of infrastructure of commonage
- No payment for commonage land by emerging farmers
- Sub-letting of commonage land by emerging farmers to commercial farmers
- Stock theft
- Management of the commonage
- Financial assistance for emerging farmers
- Illegal eviction of farm workers by commercial farmers

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7 ALTERNATIVES

7.1 REASONABLE AND FEASIBLE ALTERNATIVES

Alternatives should include consideration of all possible means by which the purpose and need of the proposed activity could be accomplished. In all cases, the no-go alternative must be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment.

"alternatives", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

- the property on which or location where it is proposed to undertake the activity.
- the type of activity to be undertaken.
- the design or layout of the activity.
- the technology to be used in the activity.
- the operational aspects of the activity.
- the option of not implementing the activity.

7.2 FUNDAMENTAL, INCREMENTAL AND NO-GO ALTERNATIVES

7.2.1 FUNDAMENTAL ALTERNATIVES

Fundamental alternatives are developments that are totally different from the proposed project description and usually include the following:

- Alternative property or location where it is proposed to undertake the activity.
- Alternative type of activity to be undertaken.
- Alternative technology to be used in the activity.

7.2.2 INCREMENTAL ALTERNATIVES

Incremental alternatives relate to modifications or variations to the design of a project that provide different options to reduce or minimise environmental impacts. There are several incremental alternatives that can be considered with respect to the current wind farm project, including:

- Alternative design or layout of the activity.
- Alternative operational aspects of the activity.

7.2.3 NO-GO ALTERNATIVE

It is mandatory to consider the "no-go" option in the EIA process. The "no-go" alternative refers to the current status quo and the risks and impacts associated with it. Some existing activities may carry risks and may be undesirable (e.g. an existing contaminated site earmarked for a development). The no-go is the continuation of the existing land use, i.e. maintain the status quo.

7.3 ANALYSIS OF ALTERNATIVES

Table 7-1 illustrates the methodology used to assess the identified alternatives. The table assesses the advantages and disadvantages, and provides further comments on the selected alternatives.

The categories of alternatives that are assessed include:

- Location;
- Activity;
- Associated technology;
- Design and layout; and
- No-go alternative.

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Table 7-1: Proposed WEF Alternatives.

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	COMMENT
Property or location This refers to the **fundamental location options**, and the environmental risks and impacts associated with such options.	**Alternative location 1** - Current proposed site (Preferred alternative). This site has been selected based on good wind resource potential, land availability and the sites proximity to available electricity grid.	▲ Suitable wind resource. ▲ Land availability (Taaibos South WEF and landowners have formally agreed to the proposed development on the site and are in full support of the use of this area).	▲ Land previously undeveloped. ▲ Potential visual intrusion to surrounding communities. ▲ Potential impacts on avifauna and bats.	**YES**	The main determining factors for selecting the proposed location were:- ▲ Proximity to a grid connection point. ▲ Available land. ▲ Available wind resource. Preliminary investigations have identified that the proposed project site meets the above land specifications.
	Alternative location 2 - None identified as the rights to **sufficiently large enough contiguous parcels of** private land must be sought from local landowners. In addition to this land in the area is being signed up by competing developers at a rapid rate. Location 1 has been agreed to. Alternative sites in the area that are close to Eskom electrical infrastructure, do not yield the same wind resource potential.	***N/A***	***N/A***	***N/A***	Alternative locations for the current project are limited and where not deemed to be either reasonable or feasible due to the following: ▲ The available wind resource is the most critical aspect of a wind energy project since a feasible WEF must generate sufficient energy to be financially feasible in terms of REIPPPP. ▲ A feasible WEF must also be located close to a connection point into the Eskom grid and substation. This is a critical factor to the overall technical and financial feasibility of the WEF project. ▲ Therefore, alternative locations for the proposed Taaibos South WEF, were not assessed.

Table 7-1: Proposed WEF Alternatives.

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	COMMENT
Type of technology This refers to the fundamental technology options, such as energy generation from wind vs. coal fired power plant, etc. and the environmental risks and impacts associated with such options.	**Alternative energy technology 1** – Wind turbines (Preferred alternative)	▲ Clean and renewable energy. ▲ Mitigate climate change ▲ Does not require large areas of land.	▲ Visually intrusive ▲ Avifaunal impacts ▲ Bat impacts	**YES**	The activity does not exclude all current land uses i.e. Wildlife and stock grazing can still take place between turbines.
	Alternative energy technology 2 – Solar PV	▲ Clean and renewable energy. ▲ Mitigate climate change.	▲ Visually intrusive (but less so than a WEF) ▲ Requires a large area of land ▲ Requires more water than wind does ▲ Generates less power per hectare than wind does	**NO**	Wind and solar are not mutually exclusive, i.e. both developments can take place in close proximity to one another. The topography of the land earmarked for the proposed Taaibos WEF is not suitable for large scale solar PV, although the low lying flatter areas are. The key motivation for wind is the distance to the grid and to unlock the potential for future solar developments.
	Alternative energy technology 3 – Concentrated Solar Power (CSP)	▲ Clean and renewable energy ▲ Mitigate climate change.	▲ Visually intrusive. ▲ Requires large area of land. ▲ Water a significant limiting factor. ▲ Reflectivity of mirrors potentially a significant issue visually and in terms of avifauna.	**NO**	Wind and solar are not mutually exclusive, i.e. both developments can take place in close proximity to one another. The topography of the land earmarked for the proposed WEF is not suitable for large scale solar CSP.
	Alternative energy technology 4 – Coal fired power plant	▲ None identified	▲ Air pollution from coal dust and smokestack emissions (SO_2).	**NO**	Not environmentally desirable and would not qualify for REIPPPP.

Table 7-1: Proposed WEF Alternatives.

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	COMMENT
			▲ Contribution to climate change. ▲ Ground contamination from coal dust.		
	Alternative energy technology 5 – Biomass	▲ Clean and renewable energy. ▲ Mitigate climate change.	▲ Expensive source of energy, requiring large amounts of feedstock	**NO**	Sufficient suitable biomass may not be available in proximity to the site. Biomass energy is mutually exclusive.
	Alternative energy technology 6– Nuclear Power	▲ Greater electricity generation with little raw material required	▲ Raw material highly radioactive ▲ Water availability a severe limitation. In South Africa, which is a water scarce country, the most suitable sites for Nuclear Power are situated adjacent to the ocean.	**NO**	The significant dependence of nuclear energy generation on high volumes of water preclude its development on the proposed site. Nuclear energy is mutually exclusive to wind energy.
Design or layout This relates mostly to alternative ways in which the proposed development or activity can be physically laid out on the ground to minimise or reduce	**Alternative layout 1:** Preliminary WEF layout, access route, electrical switching stations and short connecting powerline	▲ The preliminary layout consisted of up to 36 turbines.	▲ There may be impacts associated with upgrading and expanding road reserves in sensitive environments.	**YES**	Considering the WEF layout: A maximum of 36 turbine structures will be assessed. The preferred layout will be informed by the feasibility and EIA process and associated specialist assessments. Thus the final proposed WEF layout will be included in the final EIA report as the optimal layout from an environmental perspective, where all

Table 7-1: Proposed WEF Alternatives.

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	COMMENT
environmental risks or impacts					environmentally sensitive areas have been designated as NO-GO areas.
Operational aspects This relates mostly to alternative ways in which the development or activity can operate in order to reduce environmental risks or impacts	**Alternative operational activities**	▲ Operational Management alternatives will be informed by specialist input (e.g. bird and bat monitoring) through on-going operational monitoring.	N/A	**YES**	Operational alternatives will be informed by the specialists. The most pertinent specialists who will inform operational alternatives are the bat and avifaunal specialists. Should these specialists find that certain turbines require curtailment due to their location then this will be included as part of the operational management of the WEF. Should management stipulations be required for the proposed WEF then they will form part of the Environmental Management Programme (EMPr) of the proposed WEF.
No-go option This refers to the current status quo and the risks and impacts associated to it.	Small stock grazing and small scale game farming.	▲ Will remain relatively undisturbed.	▲ No contribution towards the national renewable energy target. ▲ Potential for the alien vegetation on site to continue detrimentally affecting the local flora.	**YES**	Assessed in this report.

8 KEY FINDINGS OF THE SPECIALIST STUDIES

Appropriately qualified and experienced specialists were appointed to undertake the various assessments identified as being necessary. Specialists gathered baseline information relevant to the study and assessed impacts associated with the Taaibos South WEF. Specialists have also made recommendations to mitigate negative impacts and enhance benefits. The resulting information has been synthesised in the section below, whilst the full specialist reports have been attached to the EIR as a Specialist Report section in Appendix E.

The following Specialist Studies have been completed for the EIA Phase–

- Agricultural Impact Assessment;
- Aquatic Impact Assessment;
- Avifaunal Impact Assessment;
- Bat Impact Assessment;
- Heritage (Archaeological) Impact Assessment;
- Noise Impact Assessment;
- Paleontological Impact Assessment;
- Riverine Rabbit Impact Assessment;
- Socio-Economic Impact Assessment;
- Terrestrial Ecology Impact Assessment;
- Visual Impact Assessment; and
- Wake Effect Study.

All specialists were provided with a Draft Layout to assess. The specialists used various sampling techniques (site visits, desktop analyses, long-term monitoring, short-term monitoring, etc.) in order to assess the Draft Layout. The results gathered from each of the specialists were then assessed by the developer in order to inform the EIR Layout presented in this report. This section summarises the key findings of the specialists on the Taaibos South WEF site and their opinion on the design of the layout by the developer to these findings (on the layout presented in this report). The sensitivity analysis, which includes the sensitive areas highlighted by the specialists, is illustrated and assessed in Chapter 10 of this report.

8.1 AGRICULTURAL IMPACT ASSESSMENT

STUDY	**Agricultural Impact Assessment, Appendix E1**
NATIONAL SCREENING TOOL	**AGRICULTURE: VERY HIGH**
SPECIALIST	**Johann Lanz**
COMPANY	**Johann Lanz Consulting**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F1**

8.1.1 CONCLUSION & SPECIALIST STATEMENT

The site has low agricultural potential predominantly because of climate constraints, but also because of soil constraints. As a result of the constraints, the site is unsuitable for crop production, and agricultural production is limited to low capacity grazing. The land impacted by the development footprint is verified in this assessment as being of low to medium agricultural sensitivity.

The amount of agricultural land loss caused by the project is well within the allowable development limits prescribed by the agricultural protocol to ensure appropriate conservation of agricultural production land. The footprint of the development is approximately eight times smaller than what the development limits allow.

The conclusion of this assessment is that the impact on the agricultural production capability of the site, as a result of the proposed development, is acceptable. This is substantiated by the facts that the land is of limited land capability and is not suitable for crop production, the amount of agricultural land loss is well within the allowable development limits prescribed by the agricultural protocol, and that the proposed development offers some positive impact on agriculture by way of improved financial security for farming operations and improved security against stock theft and crime, as well as wider, societal benefits. From an agricultural impact point of view, it is recommended that the development be approved.

8.1.2 Impacts

Two potential mechanisms of negative agricultural impact were identified as occupation of land and soil erosion and degradation. Two potential mechanisms of positive agricultural impact were identified as increased financial security for farming operations, and improved security against stock theft and other crime. All of these are likely to have very low impact on future agricultural production potential and are therefore assessed as having low significance.

8.1.3 Mitigation Measures

Mitigation measures to prevent soil degradation are all inherent in the project design and / or are standard, best-practice for construction sites.

- A system of storm water management, which will prevent erosion, will be an inherent part of the road engineering on site. Any occurrences of erosion must be attended to immediately and the integrity of the erosion control system at that point must be amended to prevent further erosion from occurring there.
- Any excavations done during the construction phase, in areas that will be re-vegetated at the end of the construction phase, must separate the upper 30 cm of topsoil from the rest of the excavation spoils and store it in a separate stockpile. When the excavation is back-filled, the topsoil must be back-filled last, so that it is at the surface. Topsoil should only be stripped in areas that are excavated. Across the majority of the site, including construction lay down areas, it will be much more effective for rehabilitation, to retain the topsoil in place. If levelling requires significant cutting, topsoil should be temporarily stockpiled and then re-spread after cutting, so that there is a covering of topsoil over the entire surface.

8.2 Aquatic Impact Assessment

STUDY	**Aquatic Impact Assessment**
NATIONAL SCREENING TOOL	**AQUATIC BIODIVERSITY: VERY HIGH**
SPECIALIST	**Rabia Mathakutha**
COMPANY	**Freshwater Ecologist Network (FEN)**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F**

8.2.1 Conclusion & Specialist Statement

FEN Consulting was appointed to conduct a specialist freshwater ecological assessment as part of the Environmental Authorisation (EA) and Water Use Authorisation (WUA) processes for the proposed Taaibos South Wind Energy Facility (WEF) and associated infrastructure. The proposed development includes the construction of various turbines linked via underground cabling, wherever technically feasible, a laydown area, new access / internal roads and upgrading of existing roads, and an administration and operations and maintenance (O&M) building (where applicable) to be used during the operational phase.

Only the proposed access and internal roads will likely directly impact on the freshwater features within the study area. All other proposed infrastructure will be located outside of the delineated extent of the freshwater features and at least 100 m from the delineated extent (i.e., turbines and associated foundations).

The construction of the proposed access and internal roads and potential upgrading of existing roads within freshwater features pose a moderate risk significance to the freshwater features.

However, the installation of appropriate culverts or subsurface drainage within new and existing road crossings is considered a positive long-term benefit for the maintenance and potential improvement of the hydrological functionality of the freshwater features and associated downstream systems. Therefore, also provided that the construction of the proposed development is undertaken during the driest period of the year when no surface water is present within the freshwater features and the recommended mitigation measures are applied, the risk significance can be reduced to Low. The contractor laydown areas, material storage facilities, and the O&M building (if applicable) must remain outside of the freshwater features, and it is recommended that these be located outside of the associated 100 m regulated area of the freshwater ecosystems.

With implementation and strict enforcement of cogent, well-developed mitigation measures as outlined in this report, with specific mention of ensuring all instream construction footprints are rehabilitated and the freshwater features monitored for any alien and invasive species establishment, no fatal flaws in terms of freshwater ecological aspects were identified and the proposed development can be considered acceptable.

Due to the overall low risk significance associated with the proposed development (having considered the worst-case scenario of the development of new and upgrading of existing road crossings through freshwater features), Water Use Authorisation by means of General Authorisation (GA) in terms of Section 21(c) and (i) water uses must be obtained from the Department of Water and Sanitation (DWS). The DWS, the custodian of water resources in South Africa, must be consulted with regards to the outcome of this assessment.

8.2.2 IMPACTS

The aquatic / freshwater ecology assessment identified the following impacts as part of the assessment process:

- Site preparation prior to construction activities and general movement of construction personnel within the 100 m GN509 ZoR but outside the delineated extent of the freshwater features.
    - Transportation of construction materials can result in disturbances to soils, and increased risk of sedimentation/erosion;
    - Soil and stormwater contamination from oils and hydrocarbons originating from construction vehicles;
    - Proliferation of alien and/or invasive vegetation as a result of disturbances.
- Construction of surface infrastructure associated with the proposed development outside the delineated freshwater features, including turbines and associated foundations, laydown area and an administration and operations and maintenance (O&M) building (if applicable):
    - Removal of vegetation and topsoil and associated stockpiling;
    - Ground-breaking and earthworks relating to foundations and trenches;
    - Mixing and casting of concrete for construction purposes.
- Creation of new road crossings within freshwater features for the proposed new access/internal roads and underground cabling
    - Site preparation prior to construction activities including movement of construction machinery/vehicles within the freshwater features and removal of vegetation;
    - Ground-breaking and excavations and trenching within/adjacent to the freshwater features; and
    - Placement of culvert structures atop concrete base.
- Upgrading of existing access roads within freshwater features:
    - Excavation within freshwater features for the removal of existing infrastructure and casting of a base (where applicable);
    - Placement of culvert structures atop concrete base;
    - Upgrading of existing roads within close proximity (within 32 m) to a freshwater feature; and

  - Miscellaneous activities by construction personnel. Moderate 55 (-1) L Operational Phase
- Operation and maintenance of the surface infrastructure associated with the proposed development located outside the delineated freshwater features and outside the GN509 ZoR, including turbines and associated foundations, laydown area and an O&M building (if applicable).
  - Proactive monitoring to ensure structural integrity is maintained and to identify early signs of failure / erosion.
- Operation and maintenance of the proposed main access roads and other existing roads traversing freshwater features (where applicable).
  - Concentrated runoff entering the freshwater features;
  - Disturbance to the freshwater vegetation.
- Removal of all surface infrastructure from the project area:
  - Movement of construction vehicles and personnel;
  - Disturbance to the buffer zone surrounding the freshwater features

8.2.3 Mitigation Measures

The following mitigation measures are recommended:

- All development footprint areas to remain as small as possible and vegetation clearing to be limited to what is essential;
- Retain as much indigenous vegetation as possible;
- All vegetation removed as part of the site clearing activities (specifically where large areas need to be cleared) must be transported from the construction site (may not be stockpiled) and disposed of at a registered waste disposal facility;
- During construction of the surface infrastructure within the 100 m GN509 Zone of Regulation (e.g., access roads), regular spraying of non-potable water or the use of chemical dust suppressants, that are approved for use near freshwater ecosystems must be implemented to reduce dust and to ensure no smothering of vegetation within the freshwater features occurs from excessive dust settling. It must be noted that specifics as to what type of dust suppressant (grey water vs. chemical dust suppressant) that will be utilised as part of the proposed development was not available at the time of assessment. Should this detail become available, it is recommended that the freshwater ecologist provide a statement on the suitability of the use of the proposed dust suppressant;
- The freshwater features outside the construction footprint not having authorised road crossings must be considered as no-go areas. No construction vehicles, nor construction personnel or vehicles may traverse through these freshwater features (except on approved road crossings);
- As far as possible, existing roads must be utilised to gain access to sites;
- Contractor laydown areas, and material storage facilities to remain outside of the freshwater features and their associated 100 m NEMA / GN509 ZoR as it would also help the proponent avoid the LN3 activities triggered within 100 m of watercourses;
- All vehicle re-fuelling is to take place in specifically designated re-fuelling areas that must be located outside of the 100 m NEMA / GN509 ZoR; and
- No vegetation may be removed from the 100 m ZoR surrounding the freshwater features where no infrastructure is planned, as this provides a natural buffer zone around the freshwater features which plays a role in dispersing surface runoff into the freshwater features, and thus prevents sedimentation and erosion thereof.
- Though the proposed turbines are located outside the 100 m GN509 Zone of Regulation, indirect impacts to the receiving freshwater environment are likely during construction, particularly on the freshwater features located downgradient of the turbines. As such appropriate mitigation measures are provided.
- The contractor laydown areas, material storage facilities, and the O&M building (if applicable) must remain outside of the freshwater features. It is also strongly recommended that these be located outside the 100 m NEMA / GN509 ZoR of the freshwater features. This in itself is considered a mitigation measure which complies with the mitigation hierarchy as advocated by the DFFE et al. (2013).
- With regards to ground-breaking activities outside the delineated extent of a freshwater feature:

- During excavation activities, the topsoil and vegetation must be stockpiled separately from other material outside the delineated extent of the freshwater features;
- Excavated materials must not be contaminated, and it must be ensured that the minimum surface area is taken up by any stockpiled materials. The mixture of the lower and upper layers of the excavated soil must be kept to a minimum, so as for later use as backfill material after construction has commenced;
- All exposed soils must be protected from wind using tarpaulins for the duration of the construction phase to prevent potential erosion and sedimentation of the freshwater features;
- Suitable drainage must be insured along the turbine foundations, in order to ensure that water does not pond or drain in a concentrated manner into the nearby freshwater features. This must be considered as part of the stormwater management plan and be overseen by the Environmental Control Officer (ECO);
- Construction of the proposed surface infrastructure may result in disturbance to the natural buffer zone surrounding the freshwater features which may result in the reduction of surface roughness. This can be mitigated by ensuring that no concentrated runoff from the surface infrastructure construction areas enter the freshwater features by installing silt traps or placing haybales down gradient of the construction footprint (until suitable basal vegetation cover has been restored) to ensure no sediment laden or concentrated runoff generates from the construction footprint; and
- It is highly recommended that an alien vegetation management plan be compiled during the planning phase and implemented concurrently with the commencement of construction.
- With regards to concrete mixing on site:
    - Concrete and cement-related mortars can be toxic to aquatic life. Proper handling and disposal must minimise or eliminate discharges into the freshwater features. High alkalinity associated with cement, can dramatically affect and contaminate both soil and ground water. The following measures must be adhered to:
    - Fresh concrete and cement mortar must not be mixed near the freshwater features. Mixing of cement may be done within the construction camp, however, may not be mixed on bare soil, and must be within a lined, bound or bunded portable mixer. Consideration must be taken to use ready mix concrete;
    - No mixed concrete shall be deposited directly onto the ground within the freshwater features (outside of the designated area) or associated riparian habitat. A batter board or other suitable platform/mixing tray is to be provided onto which any mixed concrete can be deposited whilst it awaits placing;
    - A washout area must be designated outside of the freshwater features, and wash water must be treated on-site or discharged to a suitable sanitation system;
    - Cement bags must be disposed of in the demarcated hazardous waste receptacles and the used bags must be disposed of through the hazardous substance waste stream and
    - Spilled or excess concrete must be disposed of at a suitable landfill site. Chain of custody documentation must be provided.
- With regards to backfilling of excavated areas:
    - Stockpiled material must be used as backfill material;
    - All excavated areas must be backfilled to the natural ground level with excavated material; and
    - Soil must be suitably compacted, and all construction material must be removed from the site upon the completion of construction or used in the rehabilitation process.
- Rehabilitation of the construction footprint areas:
    - All footprint areas which have been compacted must be ripped and revegetated with indigenous vegetation as soon as the construction activities have been completed. This will prevent soil erosion and the creation of gullies within the operational area; and
    - The operational area must regularly be inspected for alien and invasive vegetation species which might have established due to the construction activity related disturbances.
- It is imperative that all construction works be undertaken during the dry periods when there is no flow within the freshwater features, and thus no diversion of flow would be necessary. It is also recommended

that existing crossings through freshwater features be prioritised for upgrading rather than development of new crossings, where possible;

- The throughflow structures must be designed to ensure that the structures are geotechnically sound and that they are hydraulically stable, even if a 1:100 year flood event was to occur. The designs must include culverts installed intermittently to ensure a free draining landscape. It is recommended that a suitably qualified hydrologist be consulted to provide guidance on the relevant sizes and width requirements to ensure that hydraulic functioning of the system is maintained;
- In addition, the crossings must be designed such that should they be overtopped, they remain stable and do not lead to excessive downstream erosion and incision. It must be ensured that the final design accounts for appropriate wetting frequencies and patterns are maintained in the pre-development condition (with input from the freshwater ecologist, where necessary);
- The reaches of the freshwater features where no activities are planned to occur must be considered no-go areas. These no-go areas can be marked at a maximum distance of 5 m upstream and downstream of the proposed road upgrade crossing. This 5 m construction Right of Way would allow for construction personal, vehicles (if applicable) to enter the freshwater feature crossing where the road is proposed to be constructed;
- The clearing of vegetation within the footprint area must be kept to a minimum to avoid unnecessary disturbance within the active channel;
- The removed vegetation must be stockpiled outside of the delineated boundary of a freshwater feature. The footprint areas of these stockpiles must be kept to a minimum, and may not exceed a height of 2 m. Should the vegetation not be suitable for reinstatement after the construction phase or be alien/invasive vegetation species, all material must be disposed of at a registered garden refuse site and may not be burned or mulched on site;
- The construction footprint must be limited to a construction Right of Way that comprises a 5 m construction buffer (upstream and downstream of the freshwater ecosystem crossing) only.
- Upgrading of the informal roads must take cognisance of the delineated extent of the freshwater feature traversed by the existing informal access road and that located within close proximity to the road. Should the road be increased in width, the road must be expanded on the side opposite of a freshwater feature, to ensure that the remaining natural buffer between the access road and the freshwater feature remains intact;
- Material to be used (gravel – if applicable) as part of the upgrading of the existing roads must be stockpiled outside the delineated extent of the freshwater features (preferably at least 32 m from the freshwater feature) to prevent sedimentation thereof and to avoid any other vegetation being impacted by the construction activities. These stockpiles may not exceed a height of 2 m and must be protected from wind using tarpaulins;
- The disturbed area surrounding the road must be revegetated with suitable indigenous vegetation to prevent the establishment of alien vegetation species and to prevent erosion from occurring;
- The alien vegetation management plan as compiled by the terrestrial/botanical ecologist is highly recommended and supported by the freshwater specialist and must be implemented concurrently with the commencement of construction; and
- All existing alien and invasive vegetation must be removed. All material must be disposed of at a registered garden refuse site and may not be burned or mulched on site.
- With regards to excavation and soil compaction activities within the freshwater ecosystems (including that associated with the installation of underground cabling)
- Although the proposed freshwater ecosystems crossings upgrades are associated with generally existing farm roads, and as such the most significant impacts have already occurred, the existing gravel roads are relatively small with no formal through flow structures in most cases. The following are applicable with regards to excavation works and any concrete related activities:
    - During the excavation activities, any soil/sediment or silt removed from the freshwater feature may be temporarily stockpiled in the road reserve but outside the delineated extent of the freshwater feature. These stockpiles may not exceed 2 m in height, and their footprint must be

kept to a minimum. Stockpiling of removed materials may only be temporary (may only be stockpiled during the period of construction at a particular site) and must be disposed of at a registered waste disposal facility;
    - During trenching activities, seepage water may be present within the trench -invariably this will be filled with silt and be muddy. Therefore, any seepage must not be discharged straight into the river channel but through a silt trapping area first before entering the downstream reach;
    - Excavated materials must not be contaminated, and it must be ensured that the minimum surface area is taken up. Mixture of the lower and upper layers of the excavated soil must be kept to a minimum, for later usage as backfill material or as part of rehabilitation activities;
    - For trenching of the cables, the topsoil must be stored separately and may not be contaminated. Furthermore, the soil layers must be placed in the same order and the topsoil returned last;
    - Care must be taken to ensure that no scouring or erosion occurs as a result of the proposed culvert crossing. Installation of riprap or gabion mattresses and/or concrete aprons associated with any culverts;
    - All construction material (with specific mention of prefabricated culvert structures) must be stockpiled in the laydown area and must only be imported to the construction site when required;
    - Machinery/vehicles used to install culvert structures must be parked on the existing road surface and may not enter the freshwater features; and
    - Reno-mattresses or riprap must be installed at the outlet side of the culvert/bridge structures to ensure energy dissipation and prevent concentrated runoff into the downstream freshwater feature. The reno mattress/riprap must be installed flush with the culvert outlet.
- No indiscriminate movement of construction equipment through the freshwater features may be permitted during standard operational activities or maintenance activities. Use must be made of the existing freshwater ecosystem crossings only;
- Vehicles used in the development site must be regularly washed (on a non-permeable surface or off-site) to avoid the dispersal of seeds on any alien or invasive species into the freshwater features.
- Hot spots for the build-up of debris and excess sediment must be identified and when necessary, debris/excess sediment must be removed by hand to prevent future flooding and potential damage to infrastructure;
- Routine maintenance of the roads must be undertaken to ensure that no concentration of flow and subsequent erosion occurs due to the road crossings/instream infrastructure. Such maintenance activities must specifically be undertaken after high rainfall events;
- Stormwater runoff from the road crossings must be monitored (by the O&M Manager, to ensure it does not result in erosion of the freshwater features. Stormwater must be allowed to diffusely spread across the landscape, by ensuring adequate surface roughness in the freshwater feature (through vegetation and rocky areas);
- Maintenance vehicles must make use of dedicated access roads and no indiscriminate movement in the freshwater features may be permitted;
- During periodic maintenance activities of the roads, monitoring for erosion must be undertaken; and
- Should erosion be observed, caused by the road crossings/instream infrastructure, the area must be rehabilitated by infilling the erosion gully and revegetation thereof with suitable indigenous vegetation. Use can also be made of rocks collected from the surrounding area to infill any area prone to erosion (however, these must be sustainably sourced not taken from the surrounding freshwater features including rivers in the local area).
- No indiscriminate movement of construction equipment in the freshwater features and buffer zones surrounding the freshwater features may be permitted. Use must be made of the existing roads during the decommissioning phase;
- All surface infrastructure must be decommissioned. All materials must be removed from the freshwater features (where applicable) and may temporarily be stored/ stockpiled outside of the delineated extent

of the freshwater features, whereafter it must be removed from site and disposed of at a registered disposal facility;

- High flood peaks from the decommissioning footprint areas can be mitigated by ensuring that no concentrated runoff from the surface infrastructure area and subsequent cleared area enters the freshwater features. The velocity of surface water flow from these areas must be reduced by ensuring that the vegetation in the buffer area surrounding the freshwater features is intact or by the strategic placement of silt traps of haybales as a means to obstruct flow but still allow flow to percolate at a reduced velocity and encourages a diffuse flow pattern. In this regard it is recommended at an alien and invasive plant species management plan be implemented during the construction and operational phases to specifically prevent the spread of any such species into the sensitive ecological areas;
- Areas where surface infrastructure have been decommissioned and removed must be suitably compacted/ripped and revegetated to ensure that no erosion occurs which may contribute to the sediment load of the freshwater features;
- Should erosion gullies be noted, these areas must be rehabilitated by infilling them with suitable soil and ensuring the area is vegetated. The increased surface roughness will discourage concentrated flow paths to develop and ensure diffuse flow patterns;
- Should road crossings be decommissioned, road footprint areas within a freshwater feature must be levelled to the same level and shape as that of the upstream and downstream reaches. This will ensure a continuous bed level and prevent any concentration of surface flow from occurring;
- Channel banks associated with the freshwater features must be suitably rehabilitated (shaped end revegetated) to prevent any erosion from occurring;
- All bare areas in the investigation area, specifically where vegetation was initially cleared for surface infrastructure components) must be ripped and be revegetated within suitable indigenous vegetation species;
- Follow up revegetation must take place where initial revegetation is not successful; and
- Post-closure monitoring of the freshwater features (for a period of 3 years), with specific mention of the invasion of alien vegetation species) is recommended to be undertaken.

8.3 AVIFAUNAL IMPACT ASSESSMENT

STUDY	**Avifaunal Impact Assessment, Appendix E3**
NATIONAL SCREENING TOOL	**AVIAN: LOW and ANIMAL SPECIES: HIGH**
SPECIALIST	**Anja Albertyn**
COMPANY	**Holland & Associates Environmental Consultants**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F**

8.3.1 CONCLUSION & SPECIALIST STATEMENT

WKN Windcurrent SA (Pty) Ltd (WKN Windcurrent) is currently developing a potential Wind Energy Facility (WEF) known as the Taaibos South Wind Farm in the Northern Cape province of South Africa. As part of the feasibility investigations towards obtaining Environmental Authorisation, WildSkies Ecological Services (Pty) Ltd previously conducted an avifaunal screening assessment for the site (WildSkies, 2020). WKN Windcurrent refined the developable area on the basis of identified avifaunal constraints. This included running the VERA (Verreaux's Eagle Risk Assessment) model to identify high and medium risk areas around seven Verreaux's Eagle nests that surround the site boundary. WKN Windcurrent then appointed WildSkies to conduct the necessary 12 months pre-construction bird monitoring for the developable area which has recently concluded. WildSkies has now been appointed to conduct this avifaunal impact assessment for the environmental authorisation application, managed by CES Environmental and Social Advisory Services (CES). This report presents findings from the six pre-construction bird monitoring Site Visits spanning a year of avifaunal monitoring. Data from various methodologies have been analysed and are presented for the full site throughout the report (Avifaunal Impact Assessment).

We draw the following conclusions regarding the avifaunal community and potential impacts of the proposed wind farm:

- We classified two species as being at High risk should the project proceed, and three species at Medium risk. High risk species include: Martial Eagle (Endangered) and Verreaux's Eagle (Vulnerable). Ludwig's Bustard (Endangered), Black Harrier (Endangered) and Jackal Buzzard (near endemic, not Red Listed) were classified as Medium risk.
- It is estimated that approximately 0.36 bird fatalities could be recorded at the wind farm per year across the 15 target bird species recorded flying on site for a turbine rotor swept area of 30 – 270m. This includes: 0.08 Verreaux's Eagles; 0.02 Ludwig's Bustards; and 0.15 Jackal Buzzards. These estimates could be reduced with an increase in minimum blade height above ground as most bird flight was recorded closer to the ground than 30m. There are currently no established thresholds for acceptable impacts on bird species in South Africa. In the absence of this information we are forced to make a subjective decision as to the acceptability of the above estimates. In our view the above fatality rates are of Low significance for all target species, however, we wish to include a caveat that these data are subject to limitations and represent an absolute minimum baseline.

The Applicant (WKN Windcurrent) has redesigned the developable area of the proposed wind farm to avoid the constraints and their buffers detailed in this report. This has largely been as a result of the presence of several large raptor nests in the broader study area. VERA modelling has been consulted and the turbine layout of the proposed project has been adjusted to avoid both Medium and High Sensitivities indicated around seven Verreaux's Eagle nests surrounding the site. Four Martial Eagle nests from three territories have similarly been buffered (by 6km) to mitigate the risk of turbine collisions. Aquatic sensitivities have also been largely avoided, with the exception of one turbine proposed marginally within the 500m buffer of the FS 11 dam. Avifaunal impacts have been assessed in this document and have been mostly judged to be of Low Negative significance post-mitigation, with the exception of the impact of fatalities as a direct result of turbine and power line collisions (Moderate Negative). Our 12-month pre-construction data indicate that avifaunal abundance and diversity is relatively low on site, although given the timing of this study at the conclusion of an almost decade-long drought, our findings are almost certainly a below-average baseline. We thus urge adherence to the mitigation and management measures detailed in this report in light of our prediction that avifaunal presence on site will only increase post-drought.

According to available information consulted during this study to date, there are no fatal flaws from an avifaunal sensitivity perspective which should prevent the wind farm from receiving Environmental Authorisation.

8.3.2 IMPACTS

We assessed the potential impacts on birds during three Phases of development: Construction, Operation and Decommissioning, and made the following findings:

- Habitat destruction significance will be Low (or at worst Medium) Negative. Since this habitat destruction is largely unavoidable, we anticipate that the impact significance will remain unchanged by mitigation.
- Disturbance of birds during construction is likely to be of Low Negative significance (post-application of nest buffers).
- Disturbance of birds during operations will be of Low Negative significance.
- Displacement of birds during operations will be of Low Negative significance.
- The impact of bird collision with turbines is likely to be of Moderate Negative significance and must be effectively mitigated. Given the uncertainty around the effectiveness of the mitigation measures recommended, the significance is likely to remain at Moderate Negative post-mitigation.
- Bird electrocution and collision on overhead power lines have the potential to be of Moderate Negative significance pre-mitigation. If the above-ground power line is designed to be bird-friendly (for electrocution) and installed with line-marking devices (for collision) this impact may be relatively easily

reduced to a Low Negative significance post-mitigation for electrocution, but remains at Moderate Negative for collisions, due to the mitigation not being 100% effective.

8.3.3 MITIGATION MEASURES

In addition to the avoidance measures already implemented by the project, the following mitigation is recommended:

- The constraint areas identified by this study (which build on those identified in the screening phase) should be adhered to.
- A pre-construction avifaunal walk down should be conducted to confirm final layout and identify any sensitivities that may arise between the conclusion of the EIA process and the construction phase.
- All human activities associated with construction, operation and decommissioning should be strictly managed according to generally accepted environmental best practice standards, so as to avoid any unnecessary impact on the receiving environment.
- Use should be made of existing roads as far as possible.
- All staff, vehicle and machinery activities should be strictly controlled at all times so as to ensure that the absolute minimum of surface area is impacted.
- Care should be taken not to introduce or propagate alien plant species/weeds during construc-tion.
- Any underground cabling should follow roads at all times to reduce the impact on the habitat by grouping these linear infrastructures.
- A post-construction inspection must be conducted by an avifaunal specialist to confirm that all aspects have been appropriately handled and in particular that road and hard stand verges do not provide additional substrate for raptor prey species. It is essential that the new wind farm does not create favourable conditions for such mammals in high risk areas. We therefore recom-mend that within the first year of operations a full assessment of this aspect be made by the ornithologist contracted for post-construction monitoring. If such conditions have been created, case-specific solutions will need to be developed and implemented by the wind farm. It is strongly recommended that rodenticides not be used at the newly established Operation and Maintenance (O&M) buildings or around auxiliary infrastructure on the project site. While pest control of this nature may be effective, even so-called “environmentally friendly” rodenticides are toxic and pose significant secondary poisoning risk to predatory avifauna, especially owls.
- A bird fatality threshold and adaptive management policy must be designed by an ornithologist for the site prior to the Commercial Operation Date (COD). This policy should form an annexure of the operational EMP for the facility. This policy should identify most importantly the number of bird fatalities of priority species which will trigger a management response, appropriate responses, and time lines for such responses. Fatalities of priority bird species are usually rare events (but with very high consequence) and it is difficult to analyse trends or statistics related to these fatalities as they occur. It is therefore important to have a threshold policy in place proactively to assist adaptive management.
- An observer-led turbine Shutdown on Demand (SDOD) programme must be implemented on site from COD. This programme must consist of a suitably qualified, trained and resourced team of observers present on site for all daylight hours 365 days of the year. This team must be stationed at vantage points with full visible coverage of all turbine locations. The observers must detect incoming priority bird species, track their flights, judge when they enter a turbine proximity threshold, and alert the control room to shut down the relevant turbine until the risk has reduced. A full detailed method statement or protocol must be designed by an ornithologist prior to COD, and included as an annexure of the EMP.
- The combination of hub height and rotor diameter must be optimised to maximise the lower blade tip height above ground. Raising the lower turbine blade tip height from a typical 30m above ground to 80m above ground will reduce collision risk for cranes, Ludwig’s Bustards, Black Harrier and korhaans, which typically fly low over the ground. Raising the lower blade tip from 30 to 80m above ground as a mitigation measure benefited every target species (in terms of reduced predicted mortality). Low sample size in this study was a limitation although it has been predicted to significantly reduce fatality rates on similar projects and we recommend the implementation of this measure.

- All turbine blades must be painted according to a protocol currently under development by the South African Wind Energy Association (SAWEA) from the outset. Provision must be made by the developer for the resolution of any technical, warranty, supplier challenges that this may present.
- Any residual impacts after all possible mitigation measures have been implemented will need to be mitigated off site. The facility will need to address other sources of mortality of priority species in a measurable way so as to compensate for residual effects on the facility itself. This will need to be detailed in a Biodiversity Action Plan.
- No internal medium voltage power lines should be overhead. All such cables should be buried along road verges. Only the 132kV collector lines and grid connection power line should be above ground.
- Any overhead conductors or earth wires should be fitted with an Eskom approved anti-bird collision line-marking device to make cables more visible to birds in flight and reduce the likelihood of collisions.
- The pole design of any overhead power line should be approved by an ornithologist in terms of the electrocution risk it may pose to large birds such as eagles.
- All overhead power line within 6km of turbines should be regularly (at least quarterly) surveyed for eagle nests as part of the operational monitoring of the wind farm. The establishment of such nests would bring eagles closer to the turbines than currently the case, and increase collision risk. Any such nests should be reported to an avifaunal specialist for case specific advice.
- Should more than one power line be constructed in parallel with another either new or pre-existing power line, the pylon structures should be staggered as per Pallett et al. (2022) to increase visibility to large, slow-moving species, especially bustards and cranes.
- The "during construction" and "post-construction" monitoring programme outlined in Appendix 7 should be implemented according to the latest available version of the Best Practice Guidelines at the time. The findings from operational phase monitoring should inform an adaptive management programme to mitigate any impacts on avifauna to acceptable levels. In particular, any Verreaux's Eagle fatalities should be reported to Dr Megan Murgatroyd in order to close the feedback loop back to the VERA modelling performed for this site.

8.4 BAT IMPACT ASSESSMENT

STUDY	**Bat Impact Assessment, Appendix E4**
NATIONAL SCREENING TOOL	**BATS: HIGH and ANIMAL SPECIES: HIGH**
SPECIALIST	**Jonathan Aronson**
COMPANY	**Camissa Sustainability Solutions**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F4**

8.4.1 CONCLUSION & SPECIALIST STATEMENT

This report assessed impacts to bats that could occur because of the construction, operation and decommission of the Taaibos South WEF. The assessment was based on 12 months of baseline data on bat activity recorded at the project. Based on these data, the key issue for the WEF will be managing impacts to high-flying free-tailed bats; specifically Egyptian free-tailed bat, but also possibly Roberts's flat-headed bat. The magnitude of Egyptian free-tailed bat activity was high across the AoI, including at 60 m and 140 m, based on median bat activity with reference to MacEwan et al. (2020). For this reason, the overall impact of the project is assessed at high. While this is restricted to certain nightly time periods and seasons, this high risk needs to be addressed and the mitigation options for high-flying species are relatively limited. This is because these bats are active across most of the rotor swept zone and hence are likely to encounter wind turbine blades while foraging or commuting. Additionally, bats may also be attracted to wind turbines (Guest et al. 2022).

The proposed project can be approved considering that the overall impact to bats was assessed as moderate after the application of the mitigation measures proposed to avoid and minimise impacts to bats. Residual impacts to bats will be managed via a Biodiversity Management Plan (BMP) which will use bat fatality

thresholds as benchmarks for determining additional response actions such as the use of curtailment to reduce turbine operation during key activity times for bats.

8.4.2 IMPACTS

Impacts include:

- Modification of bat habitat (roosting, foraging, commuting)
- Bat fatality
- Light pollution
- Modification of bat habitat
- Cumulative impacts

8.4.3 MITIGATION MEASURES

The first mitigation measure proposed to manage risk is to adhere to the no-go buffers which aim to spatially avoid impacts by buffering key habitat features used by bats. This measure is likely to be effective for most bat species recorded at the project (e.g., Cape serotine, Longtailed serotine, and Natal long-fingered bat) but additional mitigation measures are needed to minimize impacts to free-tailed bats, which forage high in the air, and to reduce residual impacts. Turbine design can be effective, and it is recommended to maintain a minimum blade sweep of at least 30 m and to limit the rotor diameter as much as practicable to minimise the space where collisions might occur. Additionally, blade feathering must be implemented which will limit the rotation of turbine blades below the turbine cut-in speed when electricity is not being generated.

Mitigation measures to minimise residual impacts after the application of the above measures include curtailment and acoustic deterrents. These measures are effective, and given the predicted risk, it is possible they may need to be implemented because the fatality thresholds are relatively low. As such, the project should consider the cost and feasibility of these measures. The residual impacts must be monitored using post-construction fatality monitoring for a minimum of two years (Aronson et al. 2020). Curtailment and/or acoustic deterrents must be used if this monitoring indicates that species fatality thresholds have been exceeded (MacEwan et al. 2018) to maintain the impacts to bats within acceptable limits of change and prevent declines in the impacted bat populations. A Biodiversity Management Plan (BMP) for bats must be developed by a bat ecologist, and implemented at the start of operation, which includes the post-construction fatality monitoring plan design, fatality thresholds calculations and rationale, a curtailment plan, and an adaptive management response plan that provides an action pathway for mitigation should fatality thresholds be exceeded..

8.5 HERITAGE IMPACT ASSESSMENT

STUDY	**Heritage Impact Assessment, Appendix E6**
NATIONAL SCREENING TOOL	**ARCHAEOLOGY AND CULTURE: LOW**
SPECIALIST	**Nelius Kruger**
COMPANY	**CES**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F6**

8.5.1 CONCLUSION & SPECIALIST STATEMENT

It is the opinion of the Specialist that the proposed Taaibos South Wind Energy Facility (WEF) and its associated power line connection will have a low negative cumulative impact on the heritage value of the area for the following reasons:

- The low frequency of significant archaeological resources documented in the project area and in its immediate surroundings implies low-severity short and long-term impacts on the heritage landscape.
- The significance of the landscape in terms of its heritage is bound not to change during the course of construction, operation and decommissioning of the project.

- It should be noted that archaeological knowledge and the initiation of research projects into significant archaeological sites often result from Heritage Impact Assessments conducted for developments. Provided that significant archaeological sites are conserved and that appropriate heritage mitigation and management procedures are followed, the cumulative impact of development can be positive.

8.5.2 IMPACTS

In terms of heritage potential, archaeological resources are abundant in the surroundings of Victoria West where the project landscape holds the entire range of the Stone Age sequence including ESA, MSA and LSA materials. In addition, the landscape includes a Colonial frontier including signs of historical farming and battlegrounds.

8.5.3 MITIGATION MEASURES

Cognisant of the above impacts, the following recommendations are made based on general observations in the proposed Taaibos South WEF Project area:

- Stone Age remains occur abundantly in the project landscape where locally available raw material for the manufacture of stone tools is available in the geological setting. Most of the artefacts are probably Middle Stone Age (MSA) lithics such as blades, scrapers, chunks and cores produced on quartzite. Single possible Later Stone Age (LSA) microlithic tools were noted. Stone artefact scatters are usually located in areas with fluvial gravels along drainage lines, pans and within decomposing calcretes, rocky outcrops or ridges. Despite the high number of observations of artefacts, these resources are common and representative of similar scatters across widespread areas of the Karoo. The widespread but ephemeral scatters are often of low heritage value due to temporally mixed contexts and the frequent absence of faunal, organic and other cultural remains which is scattered over thousands of square kilometres of the Karoo. The Stone Age localities are not conservation-worthy and even though the resources may be destroyed during construction, the impact is considered to be inconsequential.
- A small rock shelter containing cultural remnants is situated in a low ridge in a northern portion of the project area west of a planned access road (TBN24). The site has potential to yield valuable archaeological information on the regional development of the LSA and it has been assigned a medium archaeological significance. It is recommended that a 100m no-go development buffer be demarcated with a fence or construction barricade during the Preconstruction Phase. Continuous site monitoring should be done in order to detect potential impact on the site at the earliest opportunity. Should impact on the site proof inevitable, a Phase 2 Assessment inclusive of site documentation, possible sampling and analysis must be conducted during the Preconstruction Phase. The necessary destruction permits from the relevant Heritage Resources Authorities should be obtained prior to site impact and destruction.
- The remains of a stone packed corbel building were documented at the area marked TBN05 approximately 100m east of turbine position T38. The site has potential to yield valuable archaeological information on the regional development of the LSA and it has been assigned a medium archaeological significance. It is recommended that a 100m no-go development buffer be demarcated with a fence or construction barricade during the Preconstruction Phase. Continuous site monitoring should be done in order to detect potential impact on the site at the earliest opportunity. Should impact on the site proof inevitable, a Phase 2 Assessment inclusive of site documentation, possible sampling and analysis must be conducted during the Preconstruction Phase. The necessary destruction permits from the relevant Heritage Resources Authorities should be obtained prior to site impact and destruction
- A small graveyard holding 3 graves occurs along the regional access road bisecting the project area (TBN21) near the Spes Bona Farmstead. The burial site, which is of high heritage significance, occurs in close proximity of project development areas and it is recommended that a 50m no-go development buffer be demarcated with a fence or construction barricade during the Preconstruction Phase. Frequent and continuous site monitoring should be done during all stages of the project in order to detect potential impact on the site at the earliest opportunity.
- Information on the layout of civil services such as access roads were made available to specialists at an advanced stage of this assessment and not all of these proposed access road alignments could be

included in site investigations. It is recommended that a suitably qualified archaeologist be appointed during the Construction Phase to monitor vegetation clearing and excavation activities for the possible occurrence of archaeological material remains and features in these areas.

- Considering the localised nature of heritage remains, the general monitoring of the development progress by an ECO or by the heritage specialist is recommended for all stages of the project. Should any subsurface palaeontological, archaeological or historical material, or burials be exposed during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately.

8.6 Noise Impact Assessment

STUDY	**Noise Impact Assessment, Appendix E7**
NATIONAL SCREENING TOOL	**NOISE: HIGH**
SPECIALIST	**Morne de Jager**
COMPANY	**Enviro Acoustic Research**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F7**

8.6.1 Conclusion & Specialist Statement

Considering the Low significance during the operational phase, it is recommended that the proposed Taaibos South WEF (and associated infrastructure) be authorized. The proposed layout (i.e., turbine placement) is considered to be acceptable from a noise perspective. No further noise studies are required (if the layout does not change, or the applicant use a WTG with an SPL less than 109.2 dBA re 1 pW).

8.6.2 Impacts

It was determined that the potential noise impacts, without mitigation, would be:

- Of a low significance for the daytime construction activities (hard standing areas, excavation and concreting of foundations and the erection of the WTG and other infrastructure);
- Of a low significance for the night-time construction activities (the pouring of concrete, erection of WTG);
- Of a low significance for daytime operational activities (noises from wind turbines) when considering the worst-case SPL; and
- Of a low significance for night-time operational activities (noises from wind turbines) when considering the worst-case SPL.

8.6.3 Mitigation Measures

The recommendation that the layout be authorized is subject to the condition that the applicant re-evaluate the noise impact should the layout be revised where:

- Any WTG, located within 1,500 m from an identified and verified NSR, are moved closer to the NSR;
- Any new WTG are introduced within 1,500 m from an identified and verified NSR;
- The number of WTG within 2,000 m from any identified and verified NSR are increased; and
- Should the applicant make use of a wind turbine with a maximum SPL exceeding 109.2 dBA re 1 pW.

To ensure that noise does not become an issue for future residents, landowners or the local communities, it is recommended that the applicant get written agreement from current landowners/community leaders that:

- No new residential dwellings will be developed within areas enveloped by the 42 dBA noise level contour, and
- Structures located within the 45 dBA noise level contour should not be used for residential use.

8.7 Palaeontological Impact Assessment

STUDY	**Palaeontological Impact Assessment, Appendix E8**
NATIONAL SCREENING TOOL	**PALAEONTOLOGY: VERY HIGH**

SPECIALIST	John Almond
COMPANY	Natura Viva
QUALIFICATIONS	Specialist Declaration and CV, Appendix F8

8.7.1 CONCLUSION & SPECIALIST STATEMENT

The palaeontological heritage of the region between Loxton and Victoria West is currently poorly known. On the basis of desktop studies as well as a 9-day palaeontological site visit to the combined renewable energy cluster project area the geological and hence palaeontological context of all the Victoria West Cluster WEF and SEF project areas is very similar. The following conclusions and recommendations therefore apply equally to each of the component renewable energy projects:

- The renewable energy project area is underlain by potentially fossiliferous continental (fluvial / lacustrine) sediments assigned to the Lower Beaufort Group (Abrahamskraal and Teekloof Formations) of Middle to Late Permian age. Provisional palaeosensitivity mapping by the DFFE Screening Tool suggests that the majority of the area is of Very High Sensitivity. However, desktop studies as well as a recent 9-day palaeontological site visit to the combined renewable energy cluster project area show that, in practice, fossil sites (rare tetrapod skeletal remains, trackways and burrows, invertebrate burrows, plant material) are very scarce here while the majority are of limited scientific and conservation value. The scarcity of fossils here is in large part due to the very poor levels of bedrock exposure - especially as regards potentially fossiliferous mudrock facies - as well as extensive regional thermal metamorphism of the Beaufort Group sediments by igneous intrusions. It is concluded that the palaeosensitivity of the project area is generally Low but with significant potential for unrecorded, largely unpredictable sites of high scientific and conservation value. The provisional palaeosensitivity mapping by the DFFE Screening Tool is accordingly contested in this report.
- None of the known fossil sites of scientific or conservation value lies within or close to the footprint of the proposed renewable energy facility (see palaeontological site data and maps in Appendix 1). Furthermore, most of the recorded sites will be protected within standard ecological buffer zones along drainage lines and no mitigation is recommended in their regard. Given the potential for additional but unrecorded fossil sites of scientific value within the project area, a specialist palaeontological heritage walk-down of the authorized project footprint is recommended in the Pre-Construction Phase. The Chance Fossil Finds Protocol tabulated in Appendix 2 (PIA) should be implemented during the Construction Phase. Recommended Mitigation and Management of palaeontological heritage for all of the Victoria West Cluster renewable energy projects is summarized in tabular form in Appendix 3 (PIA).

The proposed renewable energy project is not fatally flawed and there are no objections in terms of palaeontological heritage to its receiving environmental authorization. The recommended palaeontological heritage mitigation outlined below as well as summarized in the Chance Fossil Finds Protocol appended to this report (Appendix 2, PIA) should be included within the EMPr for the development.

8.7.2 IMPACTS

Palaeontological heritage impacts due to the proposed renewable energy project are anticipated to be Low (Negative), both before and following mitigation (Table 1, PIA). A substantial and worthwhile reduction in impact significance is expected where previously unrecorded fossil sites of high scientific value are identified and mitigated in the Pre-Construction or Construction Phase. This analysis applies to the Construction Phase; significant further impacts during the Operational and De-commissioning Phases are not anticipated.

Anticipated cumulative impacts on local palaeontological heritage due to the various Victoria West WEF and SEF projects in the context of existing or proposed renewable energy projects between Loxton and Victoria West are anticipated to be Low (Negative) and to fall within acceptable limits. This assessment is based largely on the paucity of significant fossil sites recorded hitherto within the combined cluster project area and assumes that the proposed Pre-Construction and Construction Phase mitigation measures recommended for all these projects are implemented in full.

8.7.3 Mitigation Measures

Despite the scarcity of recorded fossil sites in the region, the potential for further, unrecorded palaeontological sites of high scientific and conservation value within the renewable energy project area cannot be excluded. These sites are best identified and mitigated through (1) a specialist palaeontological heritage walk-down of the authorized WEF and SEF footprints in the Pre-Construction Phase and (2) the application of a Chance Fossil Finds Protocol by the ECO / ESO during the Construction Phase (See Appendix 2, PIA) which should be incorporated into the EMPrs for the development. The qualified palaeontologist responsible for mitigation work will need to apply for a Fossil Collection Permit for the Northern Cape from SAHRA. Fossil material collected must be curated, together with pertinent collection data, within an approved repository (e.g. museum or university collection). Minimum standards for PIA reports have been compiled by Heritage Western Cape (2021) and SAHRA (2013). Recommended Mitigation and Management Measures regarding palaeontological heritage within the Victoria West Cluster project areas are summarized in tabular form in Appendix 3, PIA.

8.8 Riverine Rabbit Impact Assessment

STUDY	**Riverine Rabbit Impact Assessment, Appendix E9**
NATIONAL SCREENING TOOL	**ANIMAL SPECIES: HIGH**
SPECIALIST	**Christy Bragg**
COMPANY	**Christy Bragg Consulting**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F9**

8.8.1 Conclusion & Specialist Statement

The construction, operations and decommission of wind turbines may lead to unfavourable environmental impacts on the Riverine Rabbit in the form of disturbance, mortality, habitat loss and fragmentation which may create barriers to geneflow. Given that the species is present in the area of interest, there is a need to assess the significance of the impacts of the development on the population.

The majority of potential impacts are likely to occur during the construction phase, however with correct mitigation strategies and adherence to the ecological sensitivity map (Figure 2), these should be largely negligible. During operation, impacts are likely to be reduced, and the main cause of potential concern is noise generated by the turbines which would amount to habitat degradation within the affected areas for rabbits affected by noise impacts. At this point in time, however, there are no studies that assess or speculate on the likely ecological impacts associated with disturbance by turbine noise and vibration on the species, and given the species' rarity, this is of concern. A literature review (Brassine & Bragg 2022) of the effects of wind energy farms (WEF) on mammals referred to the following likely impacts: habitat deterioration and fragmentation, which may create barriers to geneflow, noise effect, road mortality, visual effect, vibration and shadow flicker effects, electromagnetic field generation, macro- and micro-climate change as well as increased fire risk. Of particular concern is the possible cumulative and cascading impacts on the ecosystem across trophic levels (Lopucki et al. 2017; Thaker et al. 2018).

There are thus significant levels of uncertainty around the effectiveness of the width of the buffers needed to mitigate these impacts on known populations, for example, and this requires a different approach to the BAU approach of guessing buffer sizes. Furthermore, the cumulative impact is also of concern, given the fact that the renewable-energy industry is rapidly expanding in South Africa, including in the central Karoo where riverine rabbit occurs. A landscape level approach is required to ensure the best conservation strategies are implemented and that sub-populations remain connected through protected wildlife corridors.

The EIA phase will thus require proactive mitigation measures and it is recommended that ecologists, wind farm developers, NGOs and other stakeholders collaborate and share information to develop concerted and

sound protocol for assessing, mitigating and monitoring the impact of Renewable Energy Facilities on Riverine Rabbits. A collaboration in this regard would allow coherent mitigations to be applied at the regional scale, aim for net positive gains and create clarity on the specs across all developments for:

- No go areas
- Buffer widths for wind turbine and solar PV;
- Riverine rabbit activity patterns and curtailment of traffic accordingly;
- Wildlife passes where large roads intersect important habitat;
- Signage or traffic calming where roads intersect important habitats.

A highly recommended mitigation measure to be developed during the EIA phase would be for a long-term monitoring programme on site. Monitoring of a rare and cryptic species that inhabits dense riparian habitat is challenging but sound monitoring protocols are essential to ensure existing populations are effectively protected. Monitoring results are only comparable, however, when the method is standardized, and the same effort and methods should therefore be used on all wind farm developments in the area. It is recommended that such a coordinated monitoring programme be discussed and realized at the above-mentioned workshop.

It is recommended that research into uncertainties that may affect the long-term persistence of the species should be undertaken and research areas would be best decided by consensus from all the role-players and stakeholders.

It is further recommended that any nett positive gain projects adhere to the recently drafted Biodiversity Offset Guidelines to ensure that outcomes represent mitigation at the site level and the regional level, and follow the principles guiding effective biodiversity offsets.

8.8.2 IMPACTS

The following impacts were identified as part of the Riverine Rabbit assessment:

- The construction phase of the development would result in the destruction of riparian habitat, leading to habitat loss and fragmentation. Construction activity would also result in noise and disturbance, which could change the behaviour patterns of the species. Construction vehicles in and around the development would also increase the likelihood of roadkill mortalities. This is particularly important where access roads traverse suitable Riverine Rabbit habitat and when vehicles are active between dusk and dawn (peak periods of Riverine Rabbit activity). Construction could increase access to the site by humans and hunting dogs, which increase the likelihood of mortalities through bushmeat hunting.
- The operational phase of the wind farm facility is expected to result in disturbance and vehicle collisions but at significantly lower levels than during the construction phase. Dust and soil erosion may affect nearby High Sensitivity areas, and thus it is important that a form of soil erosion prevention is implemented. Open areas devoid of vegetation along with access roads can create increased runoff and dust, which could detrimentally affect nearby Riverine Rabbit habitat. Finally, during operation, noise generated by turbines may have a negative impact on Riverine Rabbit activity and occurrence, by reducing their ability to detect predators through audial cues and increasing baseline stress levels. This could also lead to displacement of rabbits to suboptimal foraging habitat.
- The activities associated with the decommissioning phase are very similar to the Construction Phase and can thus be considered to have the same impacts and mitigation measures as the Construction Phase.

NOTE ON UNCERTAINTIES AROUND ACOUSTIC IMPACTS OF WIND FARMS ON RIVERINE RABBITS

The amount of negative effects on species will vary depending on the type, size and local location (e.g. if it is situated in High or Low habitat suitability) of the installation, and the stage of the development lifecycle (e.g., construction, operation, maintenance or decommissioning; Helldin et al. 2012; Lovich and Ennen 2013). The size of an individual riverine rabbit's home range (15ha: Duthie 1989) is such that it may be fully enclosed by a single wind farm development, yet large enough for them to avoid local disturbances (such as turbine or

road installations) whilst remaining in the area. Yet the lack of scientific literature on in-situ acoustic impacts makes their impact uncertain. In some studies, small mammals (similar in stature to that of the Riverine Rabbit) appear to habituate to turbines, whereas others suggest that there is an negative impact on species. A recent study (Lopucki et al. 2017) found that acoustic factors are likely responsible for suppressed European hare (Lepus europaeus) presence on wind farms, and it is speculated that hares actively avoided installed wind turbines. The authors proposed that permanent high noise levels may cause harmful metabolic stress (Du et al. 2010; Kight and Swaddle 2011), or that hares, like many other lagomorphs, rely heavily on hearing to avoid danger (e.g. predation; Molinari-Jobin et al. 2004). Therefore, it is not inconceivable that the proximity of turbines may represent a risky habitat for Riverine Rabbits, due to the individuals' impaired ability to hear approaching predators or vehicles.

8.8.3 Mitigation Measures

The following mitigation measures are recommended:

- Locate developments away from identified sensitive habitats for riverine rabbits, this includes no go zones and buffer zones for turbine pads, electrical substations and housing facilities as well as construction laydown areas.
- Minimize project footprint by utilizing existing roads and disrupted areas as much as possible.
- Careful planning of road layout to minimise the length of roads traversing riparian areas that have been identified as Very high or high sensitivity which may create barriers and fragment habitats.
- Implement adequate dust control and erosion control.
- An ECO must be employed to demarcate areas for use during construction, and to ensure that the construction activities remain within the designated area and that no unauthorised activities occur outside of the construction footprint.
- Implementing adequate noise reduction measures where possible on machinery.
- Minimize noise disturbance during constructions by restricting noise to daytime (9am – 5pm) periods when rabbits are less active.
- Ensure the construction phase is done in as a short period as possible.
- Careful planning of roads to minimise the length of roads traversing through riverine habitats that have been identified as Very high or high sensitivity.
- Implementation of speed limits on both internal access WEF roads (40km/h) as well as external public roads (60km/h).
- Reduced speed limits of 40km/h where roads (both internal and external) cross High and Very high sensitivity areas identified.
- Wildlife warning signage and speed reduction measures where roads cross High and Very high sensitivity areas.
- There is higher risk of collision when riverine rabbits are active which is typically from late afternoon to early morning. Traffic should be reduced during the early hours of the morning (04:00 – 09:00) and early evening (18:00 – 22:00). During these times a low speed limit (40km/h) needs to be implemented.
- Night-time driving should be avoided as much as possible but if necessary, speed needs to be reduced significantly to avoid collisions. Lagomorph species (hares and rabbits) often freeze in headlights and require headlights to be momentarily turned off to allow the animal to move off the road.
- Reduced speeds (40km/h) also need to be implemented during reduced visibility such as misty conditions that have been observed on the site.
- Roadkill monitoring program needs to be implemented on both internal and external public roads targeting sensitive habitats and wildlife corridors. The program must be initiated at pre-construction phase and continued during construction and post-construction as well as conducted over different seasons.
- Assess efficiency of roadkill mitigation approaches via a post-implementation roadkill monitoring program.

- Education and awareness campaigns on riverine rabbits and their habitat must form part of staff induction procedures to help increase awareness, respect and responsibility towards the environment for all staff and contractors.
- Any contractor employed for development work must ensure that no rabbit or hare species are disturbed, trapped, hunted or killed by them and their team during the construction phase. Conservation-orientated clauses should be built into contracts for construction personnel, complete with penalty clauses for non-compliance.
- Inductions on safe wildlife passing and driving to reduce possible injury and roadkill alongside roads.
- Induction must include reporting of any vehicle/wildlife collision or found roadkill to the appointed Roadkill monitoring personnel.
- Any trenches built must have slopes that allow any dispersing rabbits that fall in to escape and must be backfilled.
- Prohibit all employees from hunting;
- Prohibit open fires;
- Precautionary buffers of 700m for identified very high sensitivity areas, whilst taking into consideration topographical variations at the site; i.e. turbines that are obstructed by a hill may be placed closer to riverine habitats as visual and noise impact would be buffered by the topography of the land.
- Precautionary buffers of 350m for secondary drainage lines that consist mostly of poor degraded riverine habitat and identified as either Medium or Low sensitivity.
- Implementing adequate noise reduction measures, including the use of insulation to reduce noise output from turbine hubs.
- Temporal (curtailment) restrictions. Temporal restriction strategies can focus on altering turbine operation during times or weather conditions when wildlife is most active or where a negative impact has been found during the monitoring program.
- Changing the minimum windspeed at which turbines begin to turn and generate energy (cut-in speed), so that they idle during gentle wind, reduces noise during periods of low ambient noise.
- Targeted operational timing by working with wind facility managers to target specific turbines under certain weather conditions where a negative impact has been identified.
- Measure sound pressure levels at the WEF site, taking measurements at ~0.25m from the ground with two sets of measurements taken; one when turbines are active and one when inactive and at different distances from turbines including within Riverine rabbit habitat.

8.9 Socio-Economic Impact Assessment

STUDY	**Socio-Economic Impact Assessment, Appendix E10**
NATIONAL SCREENING TOOL	**NONE RELEVANT**
SPECIALIST	**Marchelle Terblanche**
COMPANY	**INDEX**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F10**

8.9.1 Conclusion & Specialist Statement

From a social and socio-economic perspective negative impacts that could manifest for this Project are either of low or moderate significance, or can be mitigated to acceptable levels. No issues of high significance have been identified. Based on the findings of this SEIA it is the opinion of the Specialist that the construction and operation of the Taaibos South WEF may proceed, provided that the mitigation, management measures and requirements as set out in this report be incorporated in the EMPr and implemented wherever applicable.

8.9.2 Impacts

For the 24-month construction period, various positive and negative social and socio-economic impacts have been identified and are summarized below:

- Temporary employment

- Local procurement
- Induced local economic impacts
- Training / skills development / capacity building
- Employment equity
- Impacts associated with an influx of jobseekers / temporary construction workers
- Land use impacts
- Intrusion impacts
- Health and safety risks for workers

Approximately 250 direct construction-related employment opportunities will realize. In addition indirect employment and direct and induced economic impacts will manifest locally and nationally. These impacts will contribute to an increase in the livelihoods of directly and indirectly participating households for the duration of construction. Although limited, training and skills development has the potential to alleviate poverty levels over the medium to long-term, as the people involved in the Project will acquire skills. The Project also has the potential to increase the skills and capacity of the municipal structures if they are actively involved from the onset of the Project. Strong emphasis is placed on measures to include the Local Economic Development (LED) Units in the processes to enhance participation and transparency.

Negative impacts are short-term in nature and can generally be mitigated effectively. The implementation of an effective employment process in collaboration with the municipal LED Units is essential to address impacts associated with an influx of jobseekers / temporary construction workers and to avoid or minimize residual short to medium term consequences for the municipalities and landowners.

Operational phase impacts over the 25-year lifespan of the Project and their significance ratings are reflected below:

- New employment and economic impacts
- Increase in livelihoods for directly benefitting landowners
- Socio-economic contribution / Community development
- Training / skills development / capacity building
- Land use impacts
- Impacts on land values
- Impacts on tourism
- Intrusion impacts
- Impacts on sense of place
- Contribution to the national power supply

Various positive impacts of low to moderate significance are likely to manifest. The inclusion of the power produced at the Taaibos South WEF into the national grid will assist to address the national energy crisis, thereby contributing to development and is rated with a moderate positive significance. In addition, employment, procurement and induced positive economic impacts; annual compensation secured through the lease agreements for directly benefitting landowners; SED and ED spent; as well as skills development and capacity building, are some of the additional positive impacts identified.

Negative impacts pertain to land use impacts (although very limited), intrusion impacts and impacts on sense of place. Sense of place remains a personal experience and therefore the degree of confidence is ‘undecided’. Available research on the impact of wind farms on farmland values are inconclusive and would depend on a number of variables and it is thus the opinion of the SEIA Specialist that negative impacts on land values during the operational phase of the Taaibos South WEF are unlikely, but that individual negative perceptions towards the development could affect property sales negatively in terms of prolonged sale periods and fewer buyers’ interests. The impact has been rated with a ‘low negative’ significance. Even though the impact on tourism in the study area has been rated as ‘low negative’, it is possible that Meltonwold could perceive the

close proximity and visual impact of specific turbine localities as problematic. It is therefore recommended that negotiations take place with the establishment, should complaints be raised.

Should the Taaibos South WEF be decommissioned after its 25 years' lifespan, social and socio-economic impacts are expected to be similar to those that took place during the construction phase and can generally be mitigated effectively. It is not possible to accurately rate and assess decommissioning impacts at this early stage of the process due to a changing social environment and it is therefore recommended that a detailed SEIA be undertaken at the time of decommissioning to determine the actual impacts. No rating is thus be provided for impacts associated with decommissioning.

8.9.3 Mitigation Measures

The following mitigation measure are recommended:

- Maximise local employment and local content (the Project's direct sending area) through the Preferential Procurement Plan and Contractor Services Management Plan (CSMP) for all contractors that are used.
- Involve the Ubuntu LM and PKSDM from the early processes (from financial close already if possible). Determine their existing processes with regards to a labour desk and streamline employment processes between the various stakeholders.
- Appoint a Community Employer Relations Officer / CLO. Communicate with communities through this one channel to ensure transparency, limit unrealistic expectations and to avoid conflict.
- Maximise local content of procurement by procuring from the local and regional study areas as far as possible.
- Do a value-chain analysis of services required (directly and indirectly related to construction such as transport, laundry, catering, etc.). Communicate this to the PKSDM and Ubuntu LED Units at least 4 months prior to the tender process commencing in order for SMME's to prepare.
- Include minimum thresholds in the CSMP for local employment, BBEEE procurement, SMME targets, local services providers, etc.
- Maximise the Project's local content as far as possible.
- Where feasible, the Developer should:
    - Make the skill requirements clear to the municipalities in advance and do a skills analysis of the available labour force.
    - Implement a SMME skills development programme and do certification (training on how to tender, understanding contracts, basic business skills, etc.) at least 4 months prior inviting SMMEs to tender and involve the relevant LED Units in the programmes.
    - Do a Value-chain analysis of services required (directly and indirectly related to construction) and communicate this to local and district municipalities in advance so that they are prepared and equipped to take part in the tender process.
    - Require larger contractors to work with small SMMEs to train and transfer skills and include this in their respective CSMP's.
    - Implement on-the-job training for unskilled workers.
    - Capacitate the local government structures by involving them as early as possible in the Project; remain transparent throughout the processes.
    - Negotiate a MoU with the municipalities so that each role-player is clearly aware of its roles, responsibilities and timelines in the Project processes.
    - Establish an EMC or similar Forum for the duration of construction to aid communication and transparency. Members of the EMC / Forum to meet on a quarterly basis to discuss issues that may arise during the course of the construction period (if feasible).
- Obtain inputs from the local and district municipalities on the contents of the Procurement strategy and Employment Equity Plan to be implemented.
- Set targets for the employment of Youth, women and the disabled in the respective CSMPs.
- Employment / Temporary construction workers:

  - Clearly identify the beneficiary communities / labour sending area and compile the employment strategy in collaboration with the affected municipalities' LED Units.
  - Contractually oblige contractors and sub-contractors to only source labour through the labour desk / job registration database and make this known to the target communities.
  - Work through limited communication channels (e.g. Ward Councillors and the Employer Relations Officer / CLO).
  - Be vigilant not to raise unrealistic expectations amongst the local communities and workers with regards to employment, skills requirements, local procurement and so forth. Ensure transparency through the Ward Councillors, CLO and the EMC / Forum.
  - No recruitment of temporary workers at the access to the construction site.
- As part of their Social Management Plan's (SMP's), contractors to provide a transport and housing plan: (i) no workers are allowed to be housed on site or in informal housing / settlements; (ii) allow workers that do not live nearby time to return to their families at regular intervals or over weekends.
- No workers to remain on site after shifts.
- It is also recommended that the Developer embarks on a Social Awareness Campaign for the workforce that focuses on sexual health, unwanted pregnancies and related social issues.
- Security, safety and environmental health:
- 24-hour security, demarcate and fence the construction site (if possible), material stores to be secured, access control and no trespassing of workers outside designated construction areas.
- Join the local community policing forum or similar initiative for the duration of construction.
- Keep the local SAPS, other emergency services, Ward Councillors, landowners and other relevant stakeholders informed about the construction progress and time-lines.
- Develop a Fire / Emergency Management Plan in conjunction with affected and neighbouring landowners.
- Dispose of the various types of waste generated in the appropriate manner at licensed waste landfill sites at regular intervals. Comply with the waste management plan compiled for the construction phase.
- Display "danger" warning signs and "no public access" signs at all potential accesses, paths and along the periphery of the construction areas in English and the local languages.
- If water for construction is obtained from a natural water resource, comply with the Water Use Licence conditions for the duration of the construction period.
- Ensure implementation of the provisions of the Occupational Health and Safety Act No. 85 of 1993 and adhere to the Emergency and Safety plan procedures for the duration of the construction phase.
- Awareness / community engagement:
- Keep open communication channels with the landowners and address any potential issues as a matter of priority.
- Make contact details of the main contractor and procedures to lodge complaints available to landowners and the local communities through the Ward Councillors and EMC / Forum.
- Make a complaints register / log book available at the entrance to the construction site and act immediately should issues arise.
- Consult with surrounding landowners whose livestock, private residences and other infrastructure could be affected by dust, noise and other impacts that result from traffic movement and general construction activities.
- Where required, draw up a land use management plan with individual landowners to protect livestock and farmland, which addresses restricted access areas, procedures when farm gates are opened and closed and so forth.
- Rehabilitate the veld to its original state post construction.
- Comply with the EMPr requirements to address any potential noise and dust impacts.
- Proper planning, management and rehabilitation of all construction sites to forego the visual impacts of the construction activities, as proposed in the VIA (Nuleaf Planning & Environmental, October 2022).
- Implement all mitigation measures as proposed

- Discuss construction timelines with landowners so that grazing of livestock can take place away from construction areas.
- Collaborate with the necessary road management agencies when road closures are required and advertise alternative routes in advance.
- Impose penalties for reckless drivers as a way to enforce compliance to traffic rules.
- Ensure implementation of the provisions of the Occupational Health and Safety Act (Act No. 85 of 1993) and adhere to the Emergency and Safety plan procedures for the duration of the construction phase.
- Promote good conduct of employees through awareness campaigns. It is also recommended that the Developer embarks on a Social Awareness Campaign for the workforce that focuses on sexual health, unwanted pregnancies and related social issues.
- Contractors to provide a housing plan that makes provision for workers that do not live nearby to return to their families at regular intervals or over weekends.
- Provide safe and clean drinking water and instil regular water breaks to keep workers hydrated.
- Provide sufficient ablution facilities (chemical/portable toilets, etc.) at strategic locations that are cleaned regularly.
- Keep the local police, emergency and ambulance services informed of construction times and progress.
- Maximise local employment and procurement (from the local and district municipalities) wherever possible.
- Coordinate the effort to obtain temporary employment, service providers, SMME's etc. required for maintenance work, with the municipal LED Units.
- Consider the potential increase in rates and taxes when lease agreements are negotiated with landowners.
- Involve the local and district municipalities' LED Units in all processes when SED and ED projects and suitable candidates for projects and/or training programmes are identified.
- Make gender and Youth issues a specific outcome of the needs analysis to ensure that these groups are targeted.
- In conjunction with other IPP's in the region or in the RE corridor / RE Zone set up and establish a Forum (or similar structure) to coordinate community development initiatives. Meet on a quarterly basis to provide feedback and ensure transparency.
- Ensure further transparency and effective information sharing through industry associated websites, emailed newsletters, municipal noticeboards, information events and meetings and existing community channels used by the various wards.
- Become involved in local initiatives that address existing backlogs, such as the establishment and training of an Emergency Unit / Response Team for fire prevention and emergencies (e.g. with volunteers such as farmers), hospital support (e.g. equipment, training of staff where there are staff shortages, etc.) and so forth to ensure that real community based needs are met.
- Link with existing NGO's and pre-established projects but make it a requirement (and set targets) for the establishment of new community-driven development processes and for NGO's to assist in skills transfer to these new groups and processes.
- Identify existing NGO's to assist in training and skills transfer to communities and Officials.
- Link with existing training workshops and programmes for SMME development that are done by municipal LED Units.
- In collaboration with other IPPs operational in the region, establish a SMME "Village" and training centre to coordinate training efforts of SMMEs and individuals. Link with bigger institutions such as Universities and Further Education and Training (FET) institutes to increase the impact of training and skills development in the region.
- Should the affected tourism establishment raise complaints and/or concerns, consult with them and consider to remove the turbine/s that they perceive could be problematic.
- Implement an effective Land Use Management programme in collaboration with the landowners.
- Implement all mitigation and management measures as proposed
- Rehabilitate the veld to its original state post the operational phase.

- Implement an effective Land Use Management programme (procedures when gates are opened and closed, road maintenance, methods to address potential veld fires, no-go areas, etc.) in collaboration with the landowners.
- Implement all mitigation and management measures as proposed in the VIA and NIA Specialist reports.

8.10 TERRESTRIAL BIODIVERSITY IMPACT ASSESSMENT

STUDY	**Terrestrial Biodiversity Impact Assessment, Appendix E5**
NATIONAL SCREENING TOOL	**ANIMAL SPECIES: HIGH and PLANT SPECIES: MEDIUM and TERRESTRIAL BIODIVERSITY: VERY HIGH**
SPECIALIST	**Jamie Pote**
COMPANY	**Jamie Pote**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F5**

8.10.1 CONCLUSION & SPECIALIST STATEMENT

It is the conclusion of this terrestrial biodiversity assessment that the proposed activity can be constructed within acceptable terrestrial biodiversity impact limits providing the recommended mitigation actions are adhered to, including pre-construction walkdown and final layout adjustments and fauna and flora relocation.

The implementation of the management actions relating to flora and fauna as well erosion and stormwater management and post construction rehabilitation, including weed and alien invasive plant management, will minimise biodiversity impacts to acceptable levels. Habitat mapping has largely allowed the more sensitive areas (such as dolerite ridges, riverine and alluvial areas) to be avoided.

8.10.2 IMPACTS

The main impacts including actions, activities, or processes of an ecological or biodiversity nature that may have an impact or require mitigation as a result of the proposed activity include the following:

- Permanent or temporary loss of indigenous vegetation cover because of site clearing
- Loss of flora species of special concern during pre-construction site clearing activities
- Susceptibility of post construction disturbed areas to invasion by exotic and alien invasive species
- Susceptibility of some areas to erosion
- Disturbances to ecological processes
- Aquatic and Riparian processes
- Loss of Faunal Habitat
- Loss of faunal SSC due to construction activities

8.10.3 MITIGATION MEASURES

The following recommendations concerning layout planning should be considered:

- All watercourses and alluvial areas must be avoided by WEF and grid connection infrastructure. A minimum 32 m buffer is recommended around watercourses, but subject to the recommendations of the aquatic assessment. Infrastructure in proximity to or crossing watercourses should be limited to access roads, and other linear infrastructure only (such as access roads and OHL). Any specific crossing points should consider careful siting to ensure the least impact to such watercourses. Following existing tracks may not provide the optimum road layout and should be assesses on an individual basis as existing access track in the project area are generally very minor.
- No WEF or OHL infrastructure, including roads and powerlines should be sited within wetlands, pans or well-defined alluvial areas as well as significant rocky outcrops. Since the area is an arid environment and water is a critical resource, no aquatic or water related processes should not be interfered with. Powerlines may traverse wetlands or watercourses, but no pylons to be placed directly in such areas as far as possible.

- The bioregional planning indicates the areas being designated Critical Biodiversity Area 1 and 2. In terms of the associated land use guidelines the proposed activity is not compatible with the recommended land-use for such areas. Since this issue cannot be avoided, due to the location of the project site, the optimal approach would thus be to ensure connectivity is maintained across the landscape and that extensive areas are retained of each of the represented communities. Due to the large size of the project area, including the proportion that will not be developed it is anticipated this would be the case and the overall impact to conservation targets will be negligible.
- Site observations indicated that there is significant movement of general faunal species between the watercourses and the higher lying areas, which would be expected in an arid environment. While corridors following watercourses and rivers are important, it is also important not to disconnect the Riverine habitat from the surrounding landscape significantly, but this is unlikely to be the case other than a few access road crossings.
- The alluvial areas outside of the NBA designated pans and wetlands (designated Very High sensitivity) have been allocated a High sensitivity as a cautionary measure to avoid as far as possible. Site specific assessment on a case-by-case basis will be required for any footprints within such areas to ascertain if specific areas should be elevated to a Very High Sensitivity, as it is not feasible to assess all areas when only a portion are likely to be developed. This can be undertaken during the final pre-construction site walkdown processes.

In terms of identifying the most suitable area, it is recommended that the most suitable footprint areas for the WEF turbine components would include the on the edges of the plateaus, away from the alluvial areas generally in the middle and also set back from the edges to avoid rocky outcrops. Similarly, turbines can be sited on the benches and steps on the slopes, also setting back from the edge to avoid rocky pavements and the outer outcrops. In these instances, the access roads should also try and avoid both the rocky outcrops as well as any plateaux alluvial areas.

8.11 VISUAL IMPACT ASSESSMENT

STUDY	**Visual Impact Assessment, Appendix E11**
NATIONAL SCREENING TOOL	**LANDSCAPE FEATURES: VERY HIGH and SHADOW FLICKER: MEDIUM**
SPECIALIST	**Peter Velcich**
COMPANY	**Nuleaf Planning and Environmental**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F11**

8.11.1 CONCLUSION & SPECIALIST STATEMENT

The visual assessment indicates that the construction and operation of the proposed Taaibos South WEF will have a high visual effect on both the rural landscape and on sensitive receptors in the study area. The visual impact will differ amongst places, depending on the distance from the facility, but it is expected to be of the highest significance within (but not restricted to) a 5km radius of the proposed facility. Within this distance it will generally be restricted to residents of homesteads, as well as, observers travelling along the various secondary road that bisects the site. This is largely due to the relatively close distance between the observers and the wind turbines, as well as, the generally flat topography.

Overall, the significance of the visual impacts is predominately moderate to high, as a result of the generally rural character of the landscape and the fair number of homesteads located within the study area (increasing the number of sensitive receptors affected). A significance of very high is expected on sensitive receptors in close proximity (within 5km) of the proposed facility during the operational phase. Some impacts, post mitigations (if applicable), are expected to of high significant (visual impacts on sensitive receptors within the local area between 5 - 10km offset, visual quality of the landscape and the cumulative impact), moderate significance (visual impacts of construction, on sensitive receptors within the within the district between 10 - 20km offset, lighting at nights and ancillary infrastructure) and others low significance (visual impacts on sensitive receptors within the region beyond the 20km offset, shadow flicker). The facility would be visible

within an area that contains certain sensitive visual receptors who would consider visual exposure to this type of infrastructure to be intrusive. Such visual receptors include people travelling along roads and residents of the homesteads scattered throughout the region.

Conventional mitigation (e.g., such as screening of the structures) of the potential visual impacts is highly unlikely to succeed due to the nature of this type of development (tip height exceeding 320m) and the receiving environment. However, a number of best practice mitigation measures have been proposed (Section 7.4) in order to limit the impacts that can be mitigated. Additionally, irrespective of whether or not mitigation measures will reduce the significance of the anticipated visual impacts, they are considered to be best practice and should all be implemented and maintained throughout the construction, operation and decommissioning phases of the proposed facility, should it be authorized. Impacts deemed possible to mitigate are general lighting of the facility and the construction activities on sensitive receptors in close proximity of the proposed facility.

In order to ensure that all the spatial analyses and mapping undertaken in this report is as accurate as possible, a transparent and scientifically defensible approach, in line with best practice methodology for this type of assessment, has been utilised. The objective of this process is to quantify the potential visual impacts associated with the proposed Taaibos South WEF, using visibility analyses, proximity analyses and the identification of sensitive receptors. However, it must be noted that visual impact is a very subjective concept, personal to each individuals' backgrounds, opinions and perceptions. The subjects in this case are the identified sensitive receptors such as the residents of the homesteads, observers travelling along public roads and visitors to the region.

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

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

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

Since no reported objections from stakeholders or decision-makers within the region have been communicated by the EAP to the author of this report, this assessment has adopted a risk averse approach by assuming that the perception of most (if not all) of the sensitive visual receptors (bar the landowners of the properties earmarked for the development), would be predominantly negative towards the development of a WEF in the region. While still keeping in mind that there are also likely to be supporters of the Taaibos South WEF (as renewable energy generation is a global priority) amongst the population of the larger region, but they are largely expected to be indifferent to the construction of the WEF and not as vocal in their support for the wind farm as the detractors thereof.

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

In spite of the predominantly high residual ratings (as assessed in Section 7) and the likelihood that the proposed development will be met with concern and objections from some of the affected sensitive receptors and landowners in the region, this report cannot categorically state that any of the above conditions were transgressed. As such these visual impacts are not considered to be fatal flaws for a development of this nature. It is, therefore, suggested that the proposed Taaibos South WEF, as per the assessed layout be supported from a visual perspective, subject to the implementation of the suggested best practice mitigation measures, as provided in this report.

8.11.2 IMPACTS

In light of the results and findings of the Visual Impact Assessment undertaken for the Taaibos South WEF proposed, it is acknowledged that the receiving environment will be significantly visually transformed for the entire operational lifespan of the facility.

The following is a summary of the impacts assessed:

- The potential visual impact of construction on sensitive visual receptors in close proximity to the facility is likely to be of high significance before mitigation and moderate significance post mitigation.
- Visual Impact Assessment for the Proposed Taaibos South Wind Energy Facility, Northern Cape, South Africa
- The potential visual impact of facility operations on sensitive visual receptors in close proximity (within 5km) to the proposed facility is likely to be of very high significance. No mitigation is possible for a facility of this scale.
- The potential visual impact of facility operations on sensitive visual receptors within the local area (between 5 - 10km offset) to the proposed facility is likely to be of high significance. No mitigation is possible for a facility of this scale.
- The potential visual impact of facility operations on sensitive visual receptors within the district (between 10 - 20km offset) to the proposed facility is likely to be of moderate significance. No mitigation is possible for a facility of this scale.
- The potential visual impact of facility operations on sensitive visual receptors within the region (beyond the 20km offset) to the proposed facility is likely to be of low significance. No mitigation is possible for a facility of this scale.
- The anticipated visual impact of operational lighting at night on sensitive visual receptors within the study area is likely to be of high significance and may be mitigated to moderate should the possible best practice mitigation measures be implemented and approval for changes to the CAA lighting is approved.
- The expected visual impact of shadow flicker on sensitive receptors in close proximity to the proposed development is likely to be of low significance.
- The expected visual impact of ancillary infrastructure on sensitive receptors in close proximity to the proposed development is likely to be of moderate significance.
- The potential visual impact of the proposed facility operations on the visual quality of the landscape and sense of place of the region is likely to be of high significance. No mitigation is possible for a facility of this scale.
- The cumulative visual impacts are likely to be of high significance when the proposed Taaibos South WEF and the four other proposed facilities that form part of the Victoria West WEF within the study area.

8.11.3 MITIGATION MEASURES

Conventional mitigation (e.g., such as screening of the structures) of the potential visual impacts is highly unlikely to succeed due to the nature of this type of development (tip height exceeding 320m) and the receiving environment. However, a number of best practice mitigation measures have been proposed (Section 7.4) in order to limit the impacts that can be mitigated. Additionally, irrespective of whether or not mitigation measures will reduce the significance of the anticipated visual impacts, they are considered to be best practice and should all be implemented and maintained throughout the construction, operation and decommissioning phases of the proposed facility, should it be authorized. Impacts deemed possible to

mitigate are general lighting of the facility and the construction activities on sensitive receptors in close proximity of the proposed facility.

Additionally, with regards to the shadow flicker likely to be experienced by homesteads that are located on properties involved in this development, it is assumed that they are in fact aware of and to a certain extent accepting of the shadow flicker associated with these turbines, thereby not constituting a shadow flicker visual impact of concern for these receptors. However, it is recommended that further consultation is undertaken as part of the EIA consultation process with these specific sensitive receptors of the identified homesteads, in order to establish their understanding and concerns regarding this possible impact. Should it be found during the consultation process that these specific receptors are concerned with the impact associated with shadow flicker, it is then recommended that the positioning of these specific turbines be revised or removed.

8.12 Wake Effect Study

STUDY	**Wake Impact Study, Appendix E12**
NATIONAL SCREENING TOOL	**NONE APPLICABLE**
SPECIALIST	**Harmattan (Pty) Ltd**
COMPANY	**Harmattan (Pty) Ltd**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F12**

8.12.1 Conclusion & Specialist Statement

Harmattan has performed a high-level investigation into the likelihood of the wakes from the proposed Cluster affecting nearby planned and operational projects. While wake effects are a commonly observed factor, none of the development projects lie downwind of the Cluster in any significant wind sectors. The operational Noblesfontein WEF does lie downwind of an important wind sector, but distance and terrain effects are likely to mean no significant impact is experienced at that site.

8.12.2 Impacts

None of significance identified.

8.12.3 Mitigation Measures

None of significance identified.

8.13 Gaps in Knowledge

Due to the complex and dynamic nature of the environment, uncertainty and gaps in our knowledge are inevitable. The Precautionary Principle has been adopted to account for this uncertainty throughout the EIA Phase of the proposed WEF.

The Precautionary Principle ensures that:

- Uncertainty surrounding impacts are identified and addressed appropriately;
- Preventative measures are taken into account throughout the project;
- Various alternatives are thoroughly explored;
- Adequate and transparent public participation is conducted;
- A holistic approach is adopted to ensure social, economic and ecological impacts are explored, and mitigation measures are determined, through an integrated and balanced approach; and
- An adaptive approach is adopted to account for the complexities and dynamism inherent in environmental processes.

The Precautionary Principle ensures that potential impacts are predicted, avoided and mitigated to avoid threats of a serious or irreversible nature (IUCN, 2007).

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9 IMPACT ASSESSMENT

9.1 IMPACT ASSESSMENT METHODOLOGY

The following standard rating scales have been defined for assessing and quantifying the identified impacts. This is necessary since impacts have a number of parameters that need to be assessed. The identified impacts have been assessed against the following criteria:

Six factors are considered when assessing the significance of the identified issues, namely:

1. **Significance** - Each of the below criterion (points 2-6 below) are ranked with scores assigned, as presented in Table 1 to determine the overall significance of an activity. The total scores recorded for the effect (which includes scores for duration; extent; consequence and probability) and reversibility / mitigation are then read off the matrix presented in Table 9-1, to determine the overall significance of the issue. The overall significance is either negative or positive.
2. **Consequence** - the consequence scale is used in order to objectively evaluate how severe a number of negative impacts might be on the issue under consideration, or how beneficial a number of positive impacts might be on the issue under consideration.
3. **Extent** - the spatial scale defines the physical extent of the impact.
4. **Duration** - the temporal scale defines the significance of the impact at various time scales, as an indication of the duration of the impact.
5. The **probability** of the impact occurring - the likelihood of impacts taking place as a result of project actions arising from the various alternatives. There is no doubt that some impacts would occur (e.g. loss of vegetation), but other impacts are not as likely to occur (e.g. vehicle accident) and may or may not result from the proposed development and alternatives. Although some impacts may have a severe effect, the likelihood of them occurring may affect their overall significance.
6. **Reversibility / Mitigation** – The degree of difficulty of reversing and/or mitigating the various impacts ranges from very difficult to easily achievable. The four categories used are listed and explained in Table 9-1 below. Both the practical feasibility of the measure, the potential cost and the potential effectiveness is taken into consideration when determining the appropriate degree of difficulty.

The relationship of the issue to the temporal scale, spatial scale and the severity are combined to describe the overall importance rating, namely the significance of the assessed impact.

The impact is first classified as a positive (+) or negative (-) impact. The impact then undergoes an evaluation according to a set of criteria.

Table 9-1: Ranking of Evaluation Criteria.

Effect	**Duration**	
	Short term	Less than 5 years
	Medium term	Between 5-20 years
	Long term	More than 20 years
	Permanent	Over 40 years or resulting in a permanent and lasting loss
	Extent	
	Localised	Impacts affect a small area of a few hectares in extent. Often only a portion of the project area.
	Study area	The proposed site and its immediate surroundings.
	Municipal	Impacts affect the Nelson Mandela Bay Metropolitan Municipality, or any towns within the municipality.
	Regional	Impacts affect the wider area or the Northern Cape Province as a whole.
	National	Impacts affect the entire country.

	International/Global	Impacts affect other countries or have a global influence.
	Consequence	
	Slight	Slight impacts or benefits on the affected system(s) or party(ies)
	Moderate	Moderate impacts or benefits on the affected system(s) or party(ies)
	Severe/ Beneficial	Severe impacts or benefits on the affected system(s) or party(ies)
	Probability	
	Definite	More than 90% sure of a particular fact. Should have substantial supportive data.
	Probable	Over 70% sure of a particular fact, or of the likelihood of that impact occurring.
	Possible	Only over 40% sure of a particular fact, or of the likelihood of an impact occurring.
	Unsure/Unlikely	Less than 40% sure of a particular fact, or of the likelihood of an impact occurring.
Reversibility/ Mitigation	**Impact Reversibility / Mitigation**	
	Easy	The impact can be easily, effectively and cost effectively mitigated/reversed
	Moderate	The impact can be effectively mitigated/reversed without much difficulty or cost
	Difficult	The impact could be mitigated/reversed but there will be some difficultly in ensuring effectiveness and/or implementation, and significant costs
	Very Difficult	The impact could be mitigated/reversed but it would be very difficult to ensure effectiveness, technically very challenging and financially very costly

Table 9-2: Impacts Severity Rating

Impact severity *(The severity of negative impacts, or how beneficial positive impacts would be on a affected system or affected party)*	
Very severe	**Very beneficial**
An irreversible and permanent change to the affected system(s) or party(ies) which cannot be mitigated. For example the permanent loss of land.	A permanent and very substantial benefit to the affected system(s) or party(ies), with no real alternative to achieving this benefit. For example the vast improvement of sewage effluent quality.
Severe	**Beneficial**
Long term impacts on the affected system(s) or party(ies) that could be mitigated. However, this mitigation would be difficult, expensive or time consuming, or some combination of these. For example, the clearing of forest vegetation.	A long term impact and substantial benefit to the affected system(s) or party(ies). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these. For example an increase in the local economy.
Moderately severe	**Moderately beneficial**
Medium to long term impacts on the affected system(s) or party (ies), which could be mitigated. For example constructing a sewage treatment facility where there was vegetation with a low conservation value.	A medium to long term impact of real benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are equally difficult, expensive and time consuming (or some combination of these), as achieving them in this way. For example a 'slight' improvement in sewage effluent quality.
Slight	**Slightly beneficial**
Medium or short term impacts on the affected system(s) or party(ies). Mitigation is very easy, cheap, less time consuming or not necessary. For example a temporary fluctuation in the water table due to water abstraction.	A short to medium term impact and negligible benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.

No effect	Don't know/Can't know
The system(s) or party(ies) is not affected by the proposed development.	In certain cases it may not be possible to determine the severity of an impact.

Table 9-3: Overall Significance Rating

OVERALL SIGNIFICANCE *(THE COMBINATION OF ALL THE ABOVE CRITERIA AS AN OVERALL SIGNIFICANCE)*	
VERY HIGH NEGATIVE	**VERY BENEFICIAL (VERY HIGH +)**
These impacts would be considered by society as constituting a major and usually permanent change to the (natural and/or social) environment, and usually result in severe or very severe effects, or beneficial or very beneficial effects. Example: The loss of a species would be viewed by informed society as being of VERY HIGH significance. Example: The establishment of a large amount of infrastructure in a rural area, which previously had very few services, would be regarded by the affected parties as resulting in benefits with VERY HIGH significance.	
HIGH NEGATIVE	**BENEFICIAL (HIGH +)**
These impacts will usually result in long term effects on the social and/or natural environment. Impacts rated as HIGH will need to be considered by society as constituting an important and usually long term change to the (natural and/or social) environment. Society would probably view these impacts in a serious light. Example: The loss of a diverse vegetation type, which is fairly common elsewhere, would have a significance rating of HIGH over the long term, as the area could be rehabilitated. Example: The change to soil conditions will impact the natural system, and the impact on affected parties (such as people growing crops in the soil) would be HIGH.	
MODERATE NEGATIVE	**SOME BENEFITS (MODERATE +)**
These impacts will usually result in medium to long term effects on the social and/or natural environment. Impacts rated as MODERATE will need to be considered by society as constituting a fairly important and usually medium term change to the (natural and/or social) environment. These impacts are real but not substantial. Example: The loss of a sparse, open vegetation type of low diversity may be regarded as MODERATELY significant.	
LOW NEGATIVE	**FEW BENEFITS (LOW +)**
These impacts will usually result in medium to short term effects on the social and/or natural environment. Impacts rated as LOW will need to be considered by the public and/or the specialist as constituting a fairly unimportant and usually short term change to the (natural and/or social) environment. These impacts are not substantial and are likely to have little real effect. Example: The temporary changes in the water table of a wetland habitat, as these systems are adapted to fluctuating water levels. Example: The increased earning potential of people employed as a result of a development would only result in benefits of LOW significance to people who live some distance away.	
NO SIGNIFICANCE	
There are no primary or secondary effects at all that are important to scientists or the public. Example: A change to the geology of a particular formation may be regarded as severe from a geological perspective, but is of NO significance in the overall context.	
DON'T KNOW	
In certain cases it may not be possible to determine the significance of an impact. For example, the primary or secondary impacts on the social or natural environment given the available information. Example: The effect of a development on people's psychological perspective of the environment.	

All feasible alternatives and the "no-go option" will be equally assessed in order to evaluate the significance of the "as predicted" impacts (prior to mitigation) and the "residual" impacts (that remain after mitigation measures are taken into account). The reason(s) for the judgement will be provided when necessary.

All impacts must have a "cause and comment", a significance rating before mitigation, after mitigation and for the no-go option. Impacts should also indicate applicable mitigation measure/ recommendations to reduce the impact significance.

9.1.1 CUMULATIVE IMPACT APPROACH

While individual development activities can have minor impacts, the combined impacts of many developments can have serious local, regional, and even global repercussions. In this regard, Appendix 3 section 3 on the EIA process included in the 2014 EIA Regulations as amended in 2017, indicates that an EIR must contain information that is necessary for the Competent Authority to consider and come to a decision on an application and must include:
(j) An assessment of each identified potentially significant impact and risk, including: (i) cumulative impacts.

The Regulations define cumulative impacts as follows: "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.

The International Finance Corporation (IFC) (2013:21) of the World Bank defines a Cumulative Effects Assessment (CEA) as the process of:

- Analysing the potential impacts and risks of proposed developments in the context of the potential effects of other human activities and natural environmental and social external drivers on the chosen [valued component] over time; and
- Proposing concrete measures to avoid, reduce, or mitigate such cumulative impacts and risks to the extent possible.

Ecological and socio-economic systems can absorb or adapt to change, but not indefinitely. The increased pace and intensity of development activities in many regions of the world, combined with increased concern for environmental protection, has elevated the importance of CEA and management in recent years. Governments, nongovernment organizations, and project proponents are seeking innovative ways to address cumulative effects arising from climate change, worsening air quality, freshwater shortages, deforestation, noise and light pollution, and wildlife habitat fragmentation.

Cumulative effects are typically the result of incremental changes to the environment caused by multiple human activities and natural processes. For example, wildlife habitat fragmentation has many possible causes such as road building, clearing native vegetation for land development, and water diversion projects. However, cumulative effects can also result from repetitive actions such as cyclical or episodic discharges of liquid waste or sewage into a water body or many wells tapping and depleting an aquifer. There are many different types of cumulative effects including additive, interactive, and synergistic, and they manifest in different ways whereby the ability of the environment to absorb or adapt to the effect is ultimately exceeded. Ideally, CEA leads to decisions that maintain environmental resiliency.

The purpose of a CEA process is to identify the relative contribution of a proposed activity to the total stresses on the affected environment and to determine whether that environment will be able to sustain the additional stress. To accomplish this, CEA methodology typically involves scoping, baseline studies and analysis of change trends, mitigation, significance determination and adaptive follow-up including monitoring.

For the purposes of the current CEA, high reliance was placed on the results of the various specialist studies, where a specific requirement for each was to identify and assess the contribution of the proposed Taaibos South WEF to the cumulative impacts on the affected environment.

The properties affected by the Taaibos Soutjh WEF are zoned as agriculture. The current land-use includes agriculture in the form of livestock and game farming. Surrounding land-uses include game farms

(photographic and hunting safaris), other proposed WEFs, roads, open space / natural areas, mining areas, and other agricultural land.

Sadler (1996) defines cumulative impacts as the "the net result of environmental impact from a number of projects and activities". The impact of the proposed WEF may not be significant or be a serious threat to the environment, but a large number of projects in one area, or occurring in the same vegetation type may have significant impacts (DEAT, 2004). The IFC Good Practice Handbook for Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets were used to compile the section below.

The International Finance Corporation Standards (IFC) recognises Cumulative Impact Assessment (CIA) and management as essential in risk management. However, CIA is also "One of the biggest risk management challenges currently facing project developers in emerging markets…". According to the IFC, "cumulative effects (or impacts) are typically the result of incremental changes to the environment caused by multiple human activities and natural processes".

These challenges include: a lack of basic baseline data, uncertainty associated with anticipated developments, limited government capacity, and absence of strategic regional, sectoral, or integrated resource planning schemes. Considerable debate exists as to whether CIA should be incorporated into good practice of Environmental and Social Impact Assessment, or whether it requires a separate stand-alone process. As a minimum, according to the IFC, developers should assess whether their projects could contribute to cumulative impacts or be impacted upon by other projects and as such the IFC recommends that developers conduct a Rapid Cumulative Impact Assessment (RCIA) either as part of the EIA or as a separate study. This RCIA should follow six (6) general steps:

STEP 1 & 2 – Scoping level Issues identification that could have a cumulative impact

According to the IFC the first step in conducting a Cumulative Impact Assessment (CIA) is to identify what are referred to as Valued Environmental and Social Components (VECs) i.e. biophysical or social amenities that may be affected by cumulative impacts associated with a development. This is typically done through interaction with relevant stakeholders. In terms of a wind farm the following main cumulative impacts that are likely to influence decision making are anticipated:

- Visual Impacts
- Impacts on riverine rabbits, birds and bats
- Impacts on the loss of indigenous vegetation and SCCs

According to the Scottish Natural Heritage Council Guidance Notes on assessing the cumulative impact of onshore wind energy developments, the cumulative impact of a wind farm development in regard to visual impacts is a product of the distance between wind farms, the distance over which they are visible, the overall character of the landscape, the siting and design of the wind farms and the way in which the landscape is experienced. These aspects need to be assessed during the Scoping Phase to determine if the cumulative impact would be significant and thus would require a CIA during the EIA phase.

In terms of birds, collision risk, barrier effect, disturbance and displacement effects, and habitat loss would need to be determined cumulatively for the area of influence. For example, an increase in turbine numbers, as a result of multiple wind farms, could force birds to fly through the windfarm increasing collisions risk as the energetic cost of going around multiple wind farms are too high. Species that needs to be included in the assessment are those specifically sensitive to windfarms and protected species in terms of the relevant legislation. Identifying the range of species likely to be present and/or affected should be completed during

the Scoping Phase and this list should be signed-off on by the relevant stakeholders prior to the commencement of the CIA.

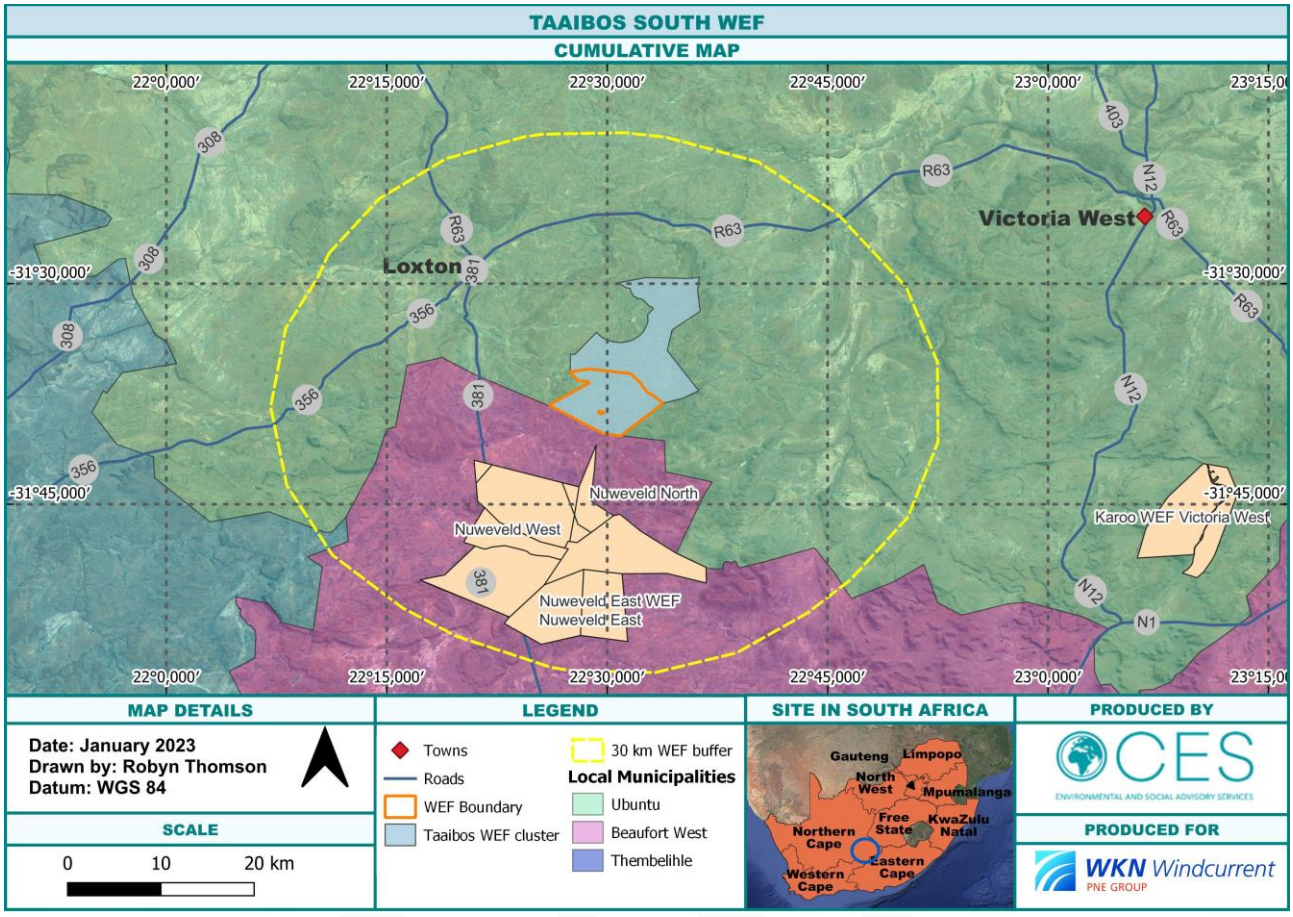
In terms of the ecological environment, the cumulative impact of the removal of the same types of vegetation for the proposed, may result in the irreplaceable loss of indigenous species and protected or rare SCCs.

In addition, the removal of indigenous vegetation with a limited distribution range, also increases the risk of invasion by alien species to the point where alien vegetation can displace entire sections of indigenous vegetation leading to local extinctions.

The physical extent to which the impacts need to be assessed will depend on past, existing and potential new (application submitted, under construction, etc.) wind farm and other developments surrounding the current proposed development. Within the proposed WEF development area and a 50 km radius around it, the following WEFs are applicable (Table 9-7).

Table 9-7: WEFs Located within a 50km radius of the Proposed Site, Inclusive of Reference, Distance and Status and Figure Below as Reference

Wind Energy Facility	Reference	Distance	Status
Taaibos North WEF	DFFE Ref: 14/12/16/3/3/2/2188	Same Developer	Scoping Submitted
Taaibos South WEF	DFFE Ref: 14/12/16/3/3/2/2187	Same Developer	Scoping Submitted
Soutrivier South WEF	DFFE Ref: 14/12/16/3/3/2/2189	Same Developer	Scoping Submitted
Soutrivier Central WEF	DFFE Ref: 14/12/16/3/3/2/2191	Same Developer	Scoping Submitted
Soutrivier North WEF	DFFE Ref: 14/12/16/3/3/2/2190	Same Developer	Scoping Submitted
Mainstream Victoria West WEF & PV	DFFE Ref: 12/12/20/1788	> 30km	Authorised
Modderfontein Solar PV Facility	DFFE Ref: 14/12/16/3/3/1/917	> 30km	Authorised
Noblesfontein Wind Energy Facility	DFFE Ref: 12/12/20/1993/2	> 20km	Operational
Ishwati Emoyeni Wind Energy Facility	DFFE Ref: 14/12/16/3/3/2/411	> 40km	Authorised
Brakpoort PV Solar PV Facility	DFFE Ref: 14/12/16/3/3/2/331	> 40km	Authorised
Nuweveld North Wind Energy Facility	DFFE Ref: 14/12/16/3/3/2/2042	< 30km	Authorised
Nuweveld West Wind Energy Facility	DFFE Ref: 14/12/16/3/3/2/2043	< 30km	Authorised
Nuweveld East Wind Energy Facility	DFFE Ref: 14/12/16/3/3/2/2044	< 30km	Authorised
Hoogland 1 Wind Energy Facility	DFFE Ref: 14/12/16/3/3/2/2147	> 30km	Scoping Submitted
Hoogland 2 Wind Energy Facility	DFFE Ref: 14/12/16/3/3/2/2146	> 30km	Scoping Submitted



In such areas, where multiple facilities will be constructed, it is important to consider the overall or cumulative impact of these facilities on various aspects such as birds and bats. Consideration of each project in isolation may not adequately judge the effect that the combined capacity of these developments will have on the abovementioned aspects.

STEP 3 – Baseline Determination

The next step in the CIA process would be to obtain baseline information from the entire affected area, which can be completed in one of two ways:

- Information sharing, i.e. specialist reports pertaining to the wind farms within the affected area can be used as a baseline and the relevant specialists will then be required to review this information and ensure that the gaps are filled within his/her specialist report to ensure that the study covers the affected area in order to complete the CIA
- Baseline information can be obtained and analysed for the affected area.

It is imperative that baseline information does not only consist of recent data collection but also include any historical data available for the area in order to identify the trends or changes over time in order to ensure that recent data is not representative of an already shifted baseline.

STEP 4 – Assessment of the contribution of the development under evaluation to the predicted cumulative impacts

The next step would be to use the baseline data obtained for the area of influence to assess the impact of the development on the relevant environmental / social variables. The methods used for the assessment would be dependent on the variable being assessed. For example, for visual impacts, maps and photomontages can be used to determine what the visual impact from a number of wind farm will be on sensitive receptors, whereas in the case of birds information required would relate to migration corridors, population viability, nesting sites, etc. For a VIA perspective, the relevant specialist would need to look at combined visibility, i.e. are a number of developments visible from a single viewpoint as well as sequential effects, i.e. does the observer have to move to another viewpoint in order to see other developments in the area (SNHC Guidance Notes).

STEP 5 – Evaluation of the significance of predicted cumulative impacts to the viability or sustainability of the affected environmental components

Step 5 entails setting thresholds for the variables to be assessed. This could for example relate to the maximum amount of turbines in a landscape before visual impacts become unacceptable. If setting specific thresholds or targets for environmental variable are not possible then another option would be to identify the limits of acceptable change. This needs to be done in conjunction with the various stakeholders so that agreement can be reached in regards to these limits. The concept of thresholds of acceptable change would then be used to assess the significance of the cumulative impact by considering the level of change associated with all developments within the applicable geographical scope relative to the limit of acceptable change. It is important to bear in mind that the cumulative impact of two similar developments may be less or greater than the sum of the impacts of the individual developments.

Impacts with regards to the visual impact of the area will vary in degree based on the sensitivity of the visual receptors, the landscape context, residents and/or visitors to the area, the magnitude of change in terms of scale, nature, duration, and frequency of combined and sequential views (SNHC Guidance Notes).

Impacts with regards to birds / riverine rabbits / bats should be assessed based on species population size, population trends and range. The spatial scale would be dependent on the conservation objectives, i.e. maintain conservation of a national scale or on a local scale.

Cumulative impacts can be desirable and undesirable. Desirable cumulative impacts of development can, for example, lower rates of unemployment and accessibility to clean energy.

STEP 6 – Design and implementation of mitigation measures to manage the development's contribution to the cumulative impacts and risks

The final step would include the management and mitigation of potential impacts. This may include negotiations with other project proponents to reduce the overall mitigation required by a single project, additional mitigation measures to further reduce impacts identified in the EIA, project design changes, etc.

9.1.2 NO-GO ALTERNATIVE IMPACT APPROACH

It is mandatory to consider the "no-go" option in the EIA process. The "no-go" alternative refers to the current status quo and the risks and impacts associated with it. Some existing activities may carry risks and may be undesirable (e.g. an existing contaminated site earmarked for a development). The no-go is the continuation of the existing land use, i.e. maintain the status quo.

The status quo for the proposed Taaibos South WEF site would include the following:

IMMEDIATE AREA OF THE PROPOSED WEF:

- Livestock grazing (proposed WEF would have a negligible impact);
- Game farming (proposed WEF would have a negligible impact);
- Alien vegetation (proposed WEF would have a positive impact);
- Ecological processes (proposed WEF would have a negative impact)

ADJACENT AREA OF THE PROPOSED WEF:

- Tourism (proposed WEF would have a negative impact);
- Job creation (proposed WEF would have a positive and a negative impact);
- Electricity stabilization (proposed WEF would have a positive impact);

9.2 General Impacts

Table 9-5 contains the general impacts associated with the proposed Taaibos South WEF. This table includes direct/indirect impacts, cumulative impacts and no-go alternatives for each impact identified. This table includes the issues, impacts, nature, pre-mitigation significance and post-mitigation significance. The full assessment of each impact as per Tables 9-4 and 9-5 above can be found in Appendix H of this Report. These tables contain full mitigation measures and include duration, extent, consequence, probability, reversibility of each impact. For the summary related to Specialist Impacts, please see Section 9.3.

9.2.1 General Impacts Calculations

Figure 9-1 (pre-mitigation) and Figure 9-2 (post mitigation) summarises the direct/indirect and cumulative impacts. Of the 55 direct/indirect and cumulative impacts identified and assessed as general impacts, most of the impacts are of a MODERATE negative significance pre-mitigation (62%) and LOW negative post-mitigation (84%). There are sixteen (16) HIGH negative significance pre-mitigation and NO high negative significance post-mitigation. There are four (4) positive impacts, two of a HIGH and two of a LOW positive significance.

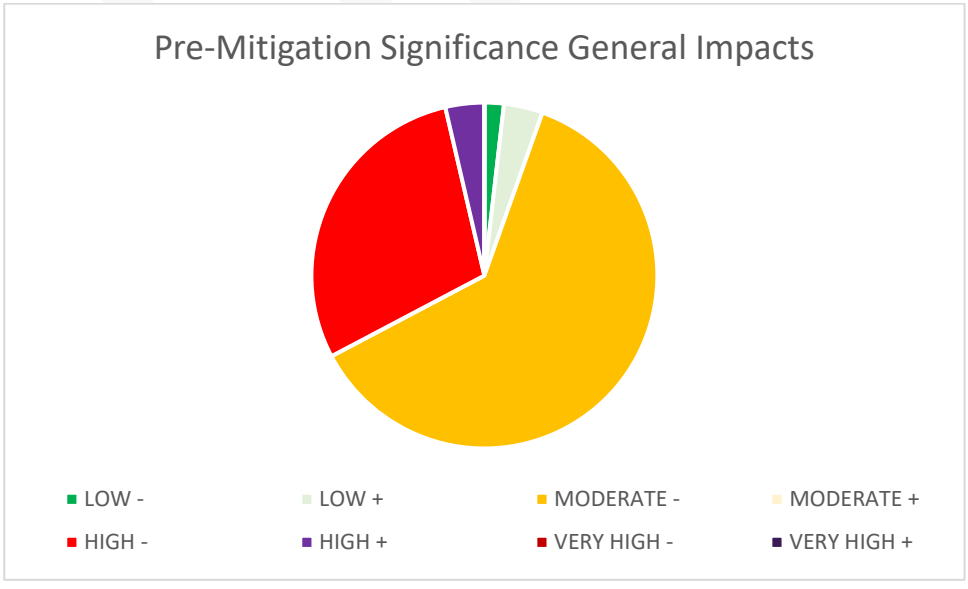


Figure 9-1: Chart Representation of General Direct and Indirect Impacts Significance, Pre-mitigation

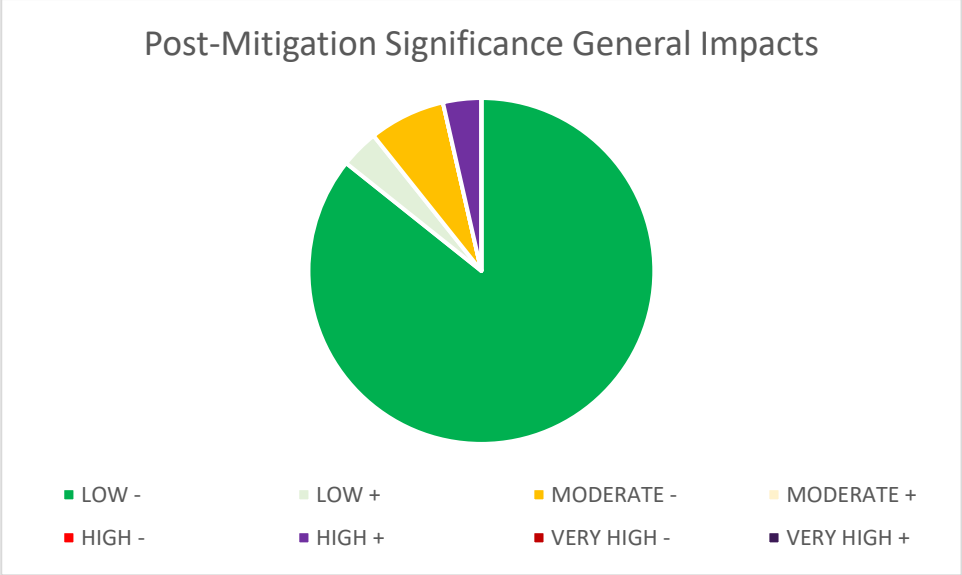


Figure 9-2: Chart Representation of General Direct and Indirect Impacts Significance, Post-mitigation

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Table 9-5: General Impacts, pre- and post-mitigation significance, and mitigation measures

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
PLANNING & DESIGN PHASE					
GENERAL IMPACTS					
TRAFFIC & TRANSPORT	Inadequate planning for the transportation of turbine parts and specialist construction equipment to the site by long and/or slow-moving vehicles could cause traffic congestion, especially if temporary road closures are required. *Cumulative impact would be high should the moving of wind turbines parts for the neighbouring Taaibos and Soutrivier WEF cluster all happen on the same timelines.* *No-go alternative would result in no impact related to transport of turbine parts.*	**DIRECT**	**MODERATE -**	*Project planning must include a plan for traffic control that will be implemented, especially during the construction phase of the development. Consultation with the local Road Traffic Unit in this regard must be done early in the planning phase. The necessary road traffic permits must be obtained for transporting parts, containers, materials and construction equipment to the site.*	**LOW -**
		CUMULATIVE	**HIGH-**		**MODERATE -**
		NO-GO	**NO IMPACT**		
	The integrity of existing highway infrastructure such as bridges and barriers may be compromised by the heavy vehicle traffic delivering components to the site. *Cumulative impact would be moderate should the moving of wind turbines parts for the neighbouring Taaibos and Soutrivier WEF cluster all happen on the same timelines.* *No-go alternative would result in no impact related to transport of turbine parts.*	**DIRECT**	**LOW -**	*Careful planning of the routes taken by heavy vehicles must highlight areas of road that may need to be upgraded in order to accommodate these vehicles. Once identified, these areas must be upgraded if necessary.*	**LOW -**
		CUMULATIVE	**MODERATE -**		**LOW -**
		NO-GO	**NO IMPACT**		
STORAGE OF HAZARDOUS SUBSTANCES	Inappropriate planning for the storage of hazardous substances such as diesel, paint, pesticides, etc, tools and equipment used on site could lead to surface and ground water pollution e.g. due to oil leaks, spillage of diesel etc. In addition, these hazardous substances could be washed off into nearby drainage lines. The mixing of cement on site could result in ground water contamination from compounds in the cement. In addition, a large number of cement mixing stations on site could increase the presence of impermeable areas which in turn could increase rates of run-off and thereby increase the risk of localized flooding, soil erosion, silting, gully	**DIRECT**	**MODERATE -**	*All hazardous substances such as paints, diesel and cement must be stored in a bunded area with an impermeable surface beneath them.* *Cement mixing must be conducted at a single location which must be centrally located, where practical. This mixing must take place on an impermeable surface, and dried waste cement must be disposed of with building rubble.*	**LOW -**
		CUMULATIVE	**HIGH -**		**LOW -**
		NO-GO	**NO IMPACT**		

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	formation, etc. The proposed BESS will not trigger this activity as it will be assembled off-site. *Cumulative impact would be high should the storage of hazardous good be non-compliant for the neighbouring Taaibos and Soutrivier WEF clusters. However, they are being proposed by the same developer and risk mitigation measures and management process will be aligned in all EMPrs.* *No-go alternative would result in no impact related to hazardous waste as the site does not currently experience issues related to hazardous substances.*				
ENVIRONMENTAL LEGAL AND POLICY COMPLIANCE	Failure to adhere to existing policies and legal obligations could lead to the project conflicting with local, provincial and national policies, guidelines and legislation. This could result in lack of institutional support for the project, overall project failure and undue disturbance to the natural environment. *Cumulative impact would be high as there are a range of renewable energy facilities proposed within the greater area. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative could result in landowners looking at other avenues of potential income which would need to comply with environmental law and policy.*	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **HIGH -** **LOW -**	*Ensure that all relevant legislation and policy is consulted and further ensure that the project is compliant with such legislation and policy.* *These must include (but not restricted to):* ▪ *Local and District Spatial Development Frameworks* ▪ *Local Municipal bylaws* *In addition, planning for the construction and operation of the proposed energy facility must consider available best practice guidelines.*	**LOW -** **LOW -** **LOW -**
STORMWATER MANAGEMENT AND EROSION	The introduction of roads and impermeable areas could increase rates of run-off and therefore the risk of localised flooding. *Cumulative impact would be moderate as there are a range of activities, including roads, which contribute to erosion at localised levels. However, these activities are not prevalent in the area.*	**INDIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -** **LOW -**	*Structures must be located at least 32m away from identified drainage lines.* *A Stormwater Management Plan must be designed and implemented to ensure maximum water seepage at the source of water flow.* *The plan must also include management mitigation measures for water pollution, wastewater management and the management of surface erosion e.g. by considering the applicability of contouring, etc.*	**LOW -** **LOW -** **LOW -**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	No-go alternative would still present a level of stormwater runoff and erosion due to current farming activities and existing impermeable surfaces.			• *An Erosion Management Plan must be designed and implemented to ensure minimal impact.*	
MANAGEMENT OF GENERAL WASTE	Inappropriate planning for management and disposal of waste e.g. storage disposal could result in surface and ground water contamination. *Cumulative impact, on a localised scale, would be high should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to general waste as the site does not currently experience issues regarding waste.*	**DIRECT**	**HIGH -**	• *Develop and implement a Waste Management Plan for handling on site waste.* • *Designate an appropriate area where waste can be stored before disposal.* • *General Waste must be disposed of at a registered landfill site.*	**LOW -**
		CUMULATIVE	**HIGH -**		**LOW -**
		NO-GO	**NO IMPACT**		
SCHEDULING OF CONSTRUCTION	Construction scheduling that does not take into account the seasonal requirements of the aquatic environment, e.g. allowing for unimpeded flood events, could lead to short-term (and potentially long-term) impacts such as excessive sediment mobilization, etc. *Cumulative impact would be high should the Taaibos and Soutrivier WEF clusters be constructed at the same time. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to construction scheduling as no other construction, that we are aware of, is planned on site.*	**INDIRECT**	**MODERATE -**	• *Wherever possible, construction activities must be undertaken during the driest part of the year to minimize downstream sedimentation due to excavation, etc.* • *When not possible, suitable stream diversions structures must be used to ensure that rivers/streams are not negatively impacted by construction activity.*	**LOW -**
		CUMULATIVE	**HIGH -**		**LOW -**
		NO-GO	**NO IMPACT**		
CONSTRUCTION PHASE					
GENERAL IMPACTS					
NUISANCE DUST	Dust is likely to be a potential nuisance due to the construction activities.	**DIRECT**	**MODERATE -**	• *Fugitive/nuisance dust must be reduced by implementing one of or a combination of the following:*	**LOW -**
		CUMULATIVE	**MODERATE -**		**LOW -**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	Cumulative impact would be moderate should the Taaibos and Soutrivier WEF clusters be constructed during the same period. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would result in no impact related to construction nuisance dust as no other construction activties, that we are aware of, are planned on site.*			▪ *Damping down of un-surfaced and un-vegetated areas;* ▪ *Retention of vegetation where possible;* ▪ *Excavations and other clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas;* ▪ *A speed limit of 40km/h must not be exceeded on dirt roads;* ⅄ *Any complaints or claims emanating from the lack of dust control must be attended to immediately by the Contractor.*	
		NO-GO	**NO IMPACT**		
FIRE	Risk of runaway fires from construction activities related to having people on site, such as cooking, smoking or burning of vegetation might lead to the burning of surrounding vegetation. *Cumulative impact would be moderate should the Taaibos and Soutrivier WEF clusters be constructed during the same period. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would still retain a fire risk as fires are a natural occurrence.*	**DIRECT**	**HIGH -**	⅄ *There must be no burning of construction waste or debris onsite.* ⅄ *Cooking and burning of vegetation is not permitted on site.* ⅄ *Smoking on site must be confined to a designated area in the vicinity of the site office which must be equipped with the necessary fire extinguishers.* ⅄ *Develop and implement a Fire Management Plan.*	**MODERATE -**
		CUMULATIVE	**HIGH -**		**MODERATE -**
		NO-GO	**HIGH -**		**MODERATE -**
STORMWATER MANAGEMENT	Sediment is likely to be created during construction. This could be washed off into the nearby drainage line e.g. during the excavation of foundations, the laying of access roads within the site, digging of cable runs and soil stripping and stockpiling to create foundations and temporary areas of hard-standing, such as the construction camp. *Cumulative impact would be high should the Taaibos and Soutrivier WEF clusters be constructed during the same period. However, it is important to note that the 5 WEFs and their*	**DIRECT**	**MODERATE -**	⅄ *The recommendations of the Stormwater Management Plan must be implemented to avoid soil erosion and siltation of drainage line.* ⅄ *The recommendations of the Erosion Management Plan must be implemented to reduce the risk of soil erosion.*	**LOW -**
		CUMULATIVE	**HIGH -**		**LOW -**
		NO-GO	**LOW -**		**LOW -**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would still present a level of stormwater runoff and erosion due to current farming activities and existing impermeable surfaces.*				
DEGRADATION OF DRAINAGE LINES FROM EARTHWORKS	Unplanned construction activities or earthworks that occur close to onsite drainage lines could cause adverse impacts such as soil erosion, siltation, and blockage of the drainage line. *Cumulative impact would be high as there are a range of activities, including roads, substations, overhead lines and neighbouring WEFs which could contribute to the degradation of drainage lines at localised levels if not properly managed during construction. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would have no impact as there are currently no earthworks activities on site that we are aware of.*	**DIRECT**	**HIGH -**	▲ *There must be no earthworks, apart from roadworks inclusive of culverts, within 32m of the drainage lines to avoid contamination of water sources.*	**LOW -**
		CUMULATIVE	**HIGH -**		**LOW -**
		NO-GO	**NO IMPACT**		
MANAGEMENT OF GENERAL WASTE	Littering by construction workers could cause surface and ground water pollution. *Cumulative impact, on a localised scale, would be high should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to general waste as the site does not currently experience issues regarding waste.*	**INDIRECT**	**MODERATE -**	▲ *A Waste Management Plan, incorporating recycling and waste minimisation, must be implemented. The Waste Management Plan must be explained to all employees as part of the environmental induction training.*	**LOW -**
		CUMULATIVE	**HIGH -**		**LOW -**
		NO-GO	**NO IMPACT**		
HAZARDOUS SUBSTANCES	Onsite maintenance of construction vehicles/machinery and equipment could result in oil, diesel and other hazardous	**DIRECT**	**MODERATE -**	▲ *The storage of fuels and hazardous materials must be located away from sensitive water resources.*	**LOW -**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	chemicals contaminating surface and ground water. Surface and ground water pollution could arise from the spillage or leaking of diesel, lubricants and cement during construction activities.			• *All hazardous substances (e.g. diesel, oil drums, etc.) must be stored in a bunded area.* • *The recommendations of the Stormwater Management Plan and the Waste Management Plan must be implemented during construction.*	
	Cumulative impact would be null as no other new activities, which include the use of hazardous substances are planned for this site (localised impact).	**CUMULATIVE**	**NO IMPACT**		
	No-go alternative would result in no impact related to hazardous waste as the site does not currently experience issues related to hazardous substances.	**NO-GO**	**NO IMPACT**		
MANAGEMENT OF CONSTRUCTION WASTE	Waste from construction activities e.g. excess concrete and cement mixture, empty paint containers, oil containers, etc., could cause pollution of ground and surface water when they come into contact with run-off water.	**DIRECT**	**MODERATE -**	• *A Waste Management Plan for the project must be developed and implemented in the construction phase.* • *All waste must be disposed of at an appropriately licensed landfill site.* • *All construction materials must be stored in a central and secure location with controlled access with an appropriate impermeable surface.* • *The recommendations of the Stormwater Management Plan must be implemented to mitigate the impacts of run-off water on pollution.*	**LOW -**
	Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.	**CUMULATIVE**	**MODERATE -**		**LOW -**
	No-go alternative would result in no impact related to construction waste as the site does not currently have any construction activities taking place.	**NO-GO**	**NO IMPACT**		
WATER QUALITY	Wet concrete is highly alkaline. This could result in flash kills of macroinvertebrates and fish species in the vicinity. Soil erosion will decrease the quality of the aquatic habitat downstream of the construction activities by silting over exposed rocks and decreasing the clarity and oxygen saturation of the water. Soil erosion will decrease the quality of the aquatic habitat downstream of the construction activities by silting over exposed rocks and decreasing the clarity and oxygen saturation of the water.	**DIRECT**	**MODERATE -**	• *No concrete mixing will take place within 32m of any watercourse.* • *The concrete batching plant must be clearly demarcated, and no sprawl must be tolerated.*	**LOW -**
		CUMULATIVE	**HIGH -**		**LOW -**
		NO-GO	**NO IMPACT**		

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	Cumulative impact, on a localised scale, would be high should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would result in no impact related to concrete contamination of watercourses as the site does not currently have any construction activities taking place.*				
INFILLING/ EXCAVATION IN A WATERCOURSE	Excavated material stockpiles may increase sediment loads in watercourses during rainfall events. Materials used for the infilling of watercourses in order to construct water crossings may not be compatible with the surrounding bed/banks, etc., which could change the characteristics of the watercourse. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to excavated stockpiles as the site does not currently have any construction activities taking place.*	**INDIRECT**	**MODERATE -**	*Stockpiled excavated material must not be stored within 32m of a watercourse.* *Stockpile areas must be suitably bunded to prevent waterborne erosion of exposed soils where there is a likelihood that the soils will be washed into a watercourse.* *Materials used for infilling must be suitably stabilized to ensure that scour and erosion of the existing bed/banks is exacerbated.*	**LOW -**
		CUMULATIVE	**MODERATE -**		**LOW -**
		NO-GO	**NO IMPACT**		
DISPOSAL OF SPOIL MATERIAL	Incorrect disposal of subsoil/spoil material could result in significant loss of a useful resource. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.*	**DIRECT**	**MODERATE -**	*Subsoil cannot be disposed of onsite without the appropriate Waste License in terms of the NEMA: Waste Act.* *Spoil could be used to rehabilitate open borrow pits or erosion features.* *Disposal of spoil material to a registered landfill must be the last option.* *No spoil stockpiles will be allowed to remain onsite once construction activities have ceased.*	**LOW -**
		CUMULATIVE	**MODERATE-**		**LOW -**
		NO-GO	**NO IMPACT**		

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	No-go alternative would result in no impact related to disposal of spoil materials as the site does not currently have any construction activities taking place.				
OPERATIONAL PHASE					
GENERAL IMPACTS					
AIR QUALITY CLIMATE CHANGE	The electricity generated by the development will displace some of that produced by fossil fuel-based forms of electricity generation. The scheme, over its lifetime, will therefore avoid the production of a significant amount of CO_2, SO_2 and NO_2 that would otherwise be emitted to the atmosphere. *Cumulative impact, on a localised scale, would be high as the area has a number of renewable energy facilities proposed, inclusive of the5 WEF cluster of Taaibos and Soutrivier.* *No-go alternative would result in a low negative impact as local power would not be offset by additional renewable energy.*	**DIRECT**	**HIGH +**	• *Enhance this impact by promoting the use of renewable energy locally.*	**HIGH +**
		CUMULATIVE	**HIGH +**		**HIGH +**
		NO-GO	**LOW -**		**LOW -**
ARCHITECTURE OF ANCILLARY INFRASTRUCTURE	Control buildings, toilet facilities and other ancillary infrastructure could cause negative visual intrusion if allowed to fall into disrepair and not maintained properly. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters operational timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to architecture of ancillary infrastructure.*	**DIRECT**	**MODERATE -**	• *All project structures and buildings must be maintained.*	**LOW -**
		CUMULATIVE	**MODERATE -**		**LOW -**
		NO-GO	**NO IMPACT**		
HAZARDOUS CHEMICAL STORAGE	Inappropriate storage of chemical, herbicides, diesel and other hazardous substances on site could result in soil and water contamination and pose a high accident danger risk. *Cumulative impact, on a localised scale, would be high should the Taaibos and Soutrivier WEF clusters operational timelines*	**DIRECT**	**HIGH -**	• *All hazardous substances must be stored in appropriately bunded locations.*	**MODERATE -**
		CUMULATIVE	**HIGH -**		**MODERATE -**
		NO-GO	**NO IMPACT**		

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would result in no impact related to hazardous waste as the site does not currently experience issues related to hazardous substances.*				
INCREASED STORMWATER RUN-OFF	Failure to maintain the stormwater system could increase the risk of surface water damage to the landscape and vegetation from increased rates of run-off and therefore the risk of localised flooding and increased sheet erosion downstream due to the presence of roads and impermeable areas of hard standing. *Cumulative impact, on a localised scale, would be high should the Taaibos and Soutrivier WEF clusters operational timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would still present a level of stormwater runoff and erosion due to current farming activities and existing impermeable surfaces.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -** **LOW -**	▲ *Recommendations of the Stormwater Management Plan and Erosion Management Plan must be implemented.*	**LOW -** **LOW -** **LOW -**
WASTE MANAGEMENT	There could be littering by maintenance workers and security personnel on site. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters operational timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to general waste as the site does not currently experience issues regarding waste.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -** **NO IMPACT**	▲ *A Waste Management Plan, incorporating recycling and waste minimisation, must be implemented. The Waste Management Plan must be implemented throughout the operational phase.*	**LOW -** **LOW -**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
DECOMMISSIONING PHASE					
GENERAL IMPACTS					
POLLUTION	Littering by construction workers could cause surface and ground water pollution. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters decommissioning timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to general waste as the site does not currently experience issues regarding waste.*	**DIRECT**	**MODERATE -**	▲ *Littering must be avoided, and litter bins must be made available at various strategic points on site.* ▲ *Refuse from the decommissioning of the site must be collected on a regular basis and deposited at an appropriate landfill.*	**LOW -**
		CUMULATIVE	**MODERATE -**		**LOW -**
		NO-GO	**NO IMPACT**		
	Onsite maintenance of construction vehicles/machinery and equipment could result in oil, diesel and other hazardous chemicals contaminating surface and ground water. Surface and ground water pollution could arise from the spillage or leaking of diesel, lubricants, etc. during decommissioning. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters decommissioning timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to hazardous waste as the site does not currently experience issues related to hazardous substances.*	**DIRECT**	**MODERATE -**	▲ *No storage of fuels and hazardous materials must be permitted near sensitive water resources. All hazardous substances (e.g. diesel, oil drums, etc.) to be stored in a bunded area.*	**LOW -**
		CUMULATIVE	**MODERATE -**		**LOW -**
		NO-GO	**NO IMPACT**		
DUST	Dust is likely to be a potential nuisance due to the decommissioning activities. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters decommissioning timelines overlap. However, it is important*	**DIRECT**	**MODERATE -**	▲ *Management of fugitive/nuisance dust could be implemented through the following:* ▪ *Damping down of un-surfaced and un-vegetated areas;* ▪ *Retention of vegetation where possible; Demolitions and other clearing activities must*	**LOW -**
		CUMULATIVE	**MODERATE-**		**LOW -**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would result in no impact related to decommissioning nuisance dust as no other decommissioning activities should be taking place on the site, that we are aware of.*			*only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas;* ▪ *A speed limit of 40km/h must not be exceeded on dirt roads.* ⅄ *Any complaints or claims emanating from the lack of dust control must be attended to immediately by the Contractor.*	
		NO-GO	**NO IMPACT**		
TRAFFIC & TRANSPORT	A high number of heavy vehicle movements will occur during the decommissioning phase. This may have a detrimental effect on sensitive receptors. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters decommissioning timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to traffic and transport as no other decommissioning activities should be taking place on the site, that we are aware of.*	**DIRECT**	**MODERATE -**	⅄ *Construction vehicles and machinery must make use of existing infrastructure such as roads as far as possible to minimise disturbance on the receiving environment.*	**LOW -**
		CUMULATIVE	**MODERATE -**		**LOW -**
		NO-GO	**NO IMPACT**		
SOIL EROSION	After the removal of all wind turbine related structures, the disturbed soils could become exposed, unstable and prone to erosion. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters decommissioning timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to soil erosion as a result of turbine removal as no other WEFs are planned on this site.*	**DIRECT**	**MODERATE -**	⅄ *After the removal of all wind turbine-related structures, the disturbed soils must be re-vegetated to avoid unnecessary soil erosion. This must be based on the Revegetation Plan and the Erosion Management Plan.*	**LOW -**
		CUMULATIVE	**MODERATE -**		**LOW -**
		NO-GO	**NO IMPACT**		

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
LAND-USE	Land previously unavailable for certain types of land use will now be available for those uses. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters decommissioning timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact as the site will return to what it was used for before, i.e. the current status quo.*	**DIRECT**	**LOW +**	*No mitigation necessary*	**LOW +**
		CUMULATIVE	**LOW +**		**LOW +**
		NO-GO	**NO IMPACT**		

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9.3 SPECIALIST IMPACTS

Error! Reference source not found. contains the specialist impacts associated with the proposed Taaibos South WEF. This table includes direct/indirect impacts, cumulative impacts and no-go alternatives for each impact identified. This table includes the issues, impacts, nature, pre-mitigation significance and post-mitigation significance. The full assessment of each impact as per **Error! Reference source not found.** above can be found in Appendix H of this Report and in each individual Specialist Report, Appendix E. These tables contain full mitigation measures and include duration, extent, consequence, probability, reversibility of each impact. For the summary related to General Impacts, please see Section 9.2.

9.3.1 SPECIALIST IMPACTS CALCULATIONS

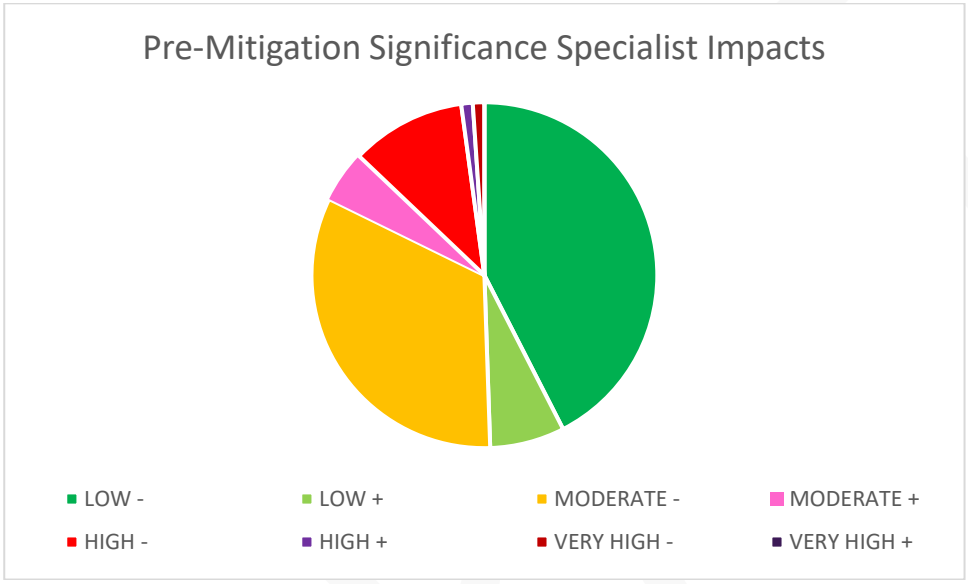

Figure 9- (pre-mitigation) and Figure 9- (post mitigation) summarises the direct/indirect and cumulative specialist impacts. Of the 162 negative impacts 53 are mitigated from HIGH/MODERATE to LOW negative post-mitigation significance. Of the 24 positive impacts 7 are mitigated from LOW to MODERATE positive post-mitigation significance.

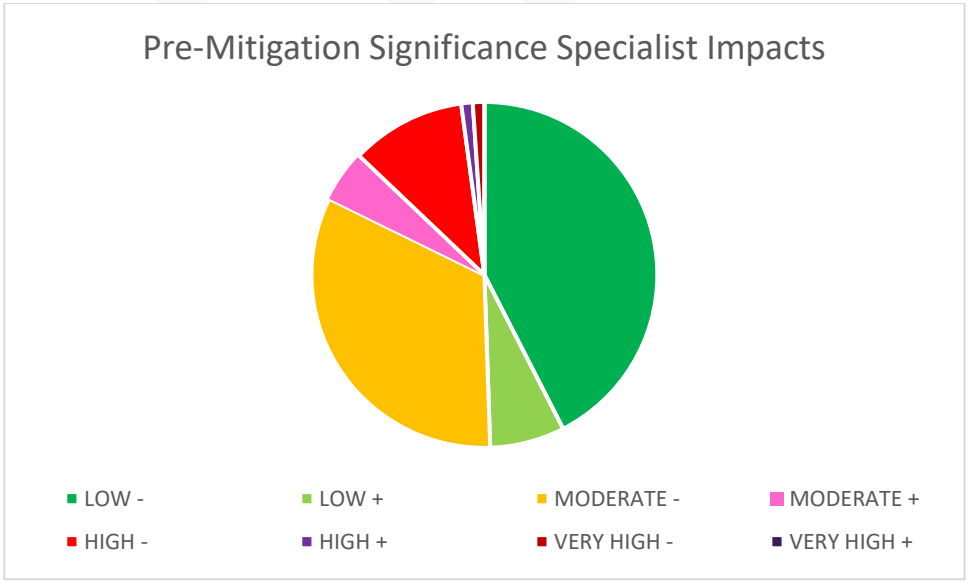

Figure 9-3: Chart Representation of Specialist Direct and Indirect Impacts Significance, Pre-mitigation

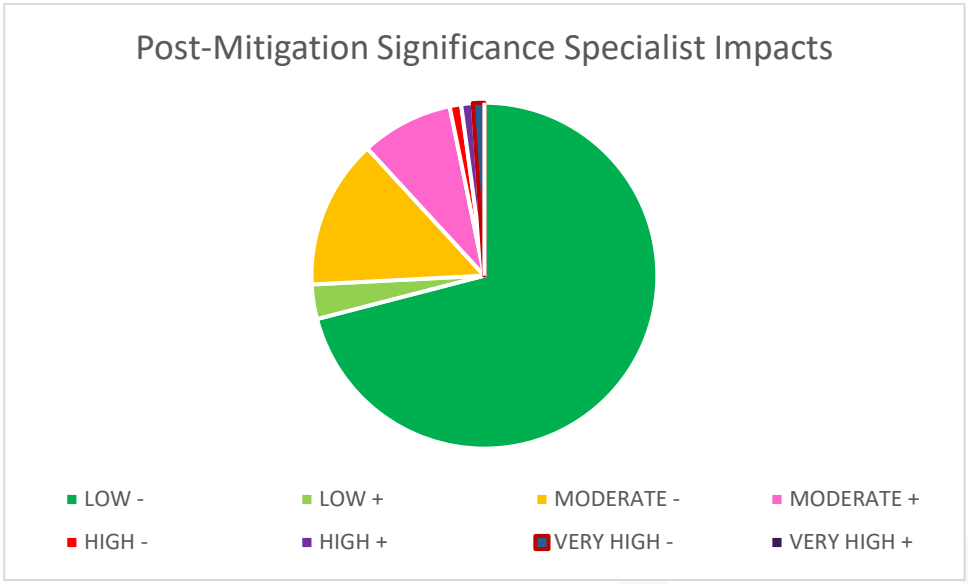

Figure 9-4: Chart Representation of Specialist Direct and Indirect Impacts Significance, Post-mitigation

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Table 9-6: Specialist Impacts pre- and post-mitigation significance, and mitigation measures

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
PLANNING & DESIGN PHASE					
It is important to note that specialist planning and design phase impacts were not expected since the developer designed the layout presented in the EIR based on sensitivity data and constraints provided by the various specialists. The planning and design impacts were therefore mitigated at Planning Phase.					
AGRICULTURAL IMPACT ASSESSMENT					
None identified by specialist					
AQUATIC IMPACT ASSESSMENT					
None identified by specialist					
AVIFAUNAL IMPACT ASSESSMENT					
None identified by specialist					
BAT IMPACT ASSESSMENT					
None identified by specialist					
HERITAGE IMPACT ASSESSMENT					
None identified by specialist					
NOISE IMPACT ASSESSMENT					
None identified by specialist					
PALAEONTOLOGICAL IMPACT ASSESSMENT					
None identified by specialist					
RIVERINE RABBIT IMPACT ASSESSMENT					
None identified by specialist					
SOCIO-ECONOMIC IMPACT ASSESSMENT					
None identified by specialist					
TERRESTRIAL BIODIVERSITY IMPACT ASSESSMENT					
None identified by specialist					
VISUAL IMPACT ASSESSMENT					
None identified by specialist					
WAKE EFFECT STUDY					
None identified by specialist					
CONSTRUCTION PHASE					
AGRICULTURAL IMPACT ASSESSMENT					
OCCUPATION OF	Agricultural land directly occupied by the	**DIRECT**	**LOW -**	*The allowable development limit on land of*	**LOW -**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
LAND	development infrastructure will become restricted for agricultural use, with consequent potential loss of agricultural productivity for the duration of the project lifetime. The small and widely distributed nature of the agricultural footprint of the facility means that only an insignificant proportion of the available agricultural land is impacted in this way. The potential cumulative agricultural impact of importance is a regional loss (including by degradation) of future agricultural production potential. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.*	**CUMULATIVE** **NO-GO**	**LOW -** **NO IMPACT**	*low and medium agricultural sensitivity with a land capability of < 8, as this site has been verified to be, is 2.5 ha per MW. This would allow the proposed facility of 270 MW to occupy an agricultural footprint of 675 hectares. The wind facility being assessed will occupy an agricultural footprint of < 81 hectares. It is therefore confirmed that the agricultural footprint of this development will be well within the allowable limit. It will in fact be approximately eight times smaller than what the development limits allow.*	**LOW -** **NO IMPACT**
SOIL EROSION AND DEGRADATION	Erosion can occur as a result of the alteration of the land surface run-off characteristics, predominantly through the establishment of hard surface areas including roads. Soil erosion is completely preventable. The storm water management that will be an inherent part of the road engineering on site and standard, best practice erosion control measures recommended and included in the EMPr, are likely to be effective in preventing soil erosion. Loss of topsoil	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -** **NO IMPACT**	*Mitigation measures to prevent soil degradation are all inherent in the project design and / or are standard, best-practice for construction sites.* *A system of storm water management, which will prevent erosion, will be an inherent part of the road engineering on site. Any occurrences of erosion must be attended to immediately and the integrity of the erosion control system at that*	**LOW -** **LOW -** **NO IMPACT**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	can result from poor topsoil management during construction related excavations. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.*			*point must be amended to prevent further erosion from occurring there.* *Any excavations done during the construction phase, in areas that will be re-vegetated at the end of the construction phase, must separate the upper 30 cm of topsoil from the rest of the excavation spoils and store it in a separate stockpile. When the excavation is back-filled, the topsoil must be back-filled last, so that it is at the surface. Topsoil should only be stripped in areas that are excavated. Across the majority of the site, including construction lay down areas, it will be much more effective for rehabilitation, to retain the topsoil in place. If levelling requires significant cutting, topsoil should be temporarily stockpiled and then re-spread after cutting, so that there is a covering of topsoil over the entire surface.*	
AQUATIC IMPACT ASSESSMENT					
VEHICULAR MOVEMENT (TRANSPORTATION OF CONSTRUCTION MATERIALS)	Loss of freshwater vegetation, associated habitat and ecosystem services from indirect impacts; Transportation of construction materials can result in disturbances to soils, and increased risk of sedimentation/erosion; and Soil and stormwater contamination from oils and hydrocarbons originating from construction vehicles. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **MODERATE -**	*All development footprint areas to remain as small as possible and vegetation clearing to be limited to what is essential;* *Retain as much indigenous vegetation as possible;* *All vegetation removed as part of the site clearing activities (specifically where large areas need to be cleared) must be transported from the construction site (may not be stockpiled) and disposed of at a registered waste disposal facility;* *During construction of the surface infrastructure within the 100 m GN509 Zone of Regulation (e.g., access roads), regular*	**LOW -** **LOW -**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	standard. *No-go alternative would result in no impact related to disturbance of aquatic habitats as no known construction activities are present on site.*			*spraying of non-potable water or the use of chemical dust suppressants, that are approved for use near freshwater ecosystems must be implemented to reduce dust and to ensure no smothering of vegetation within the freshwater features occurs from excessive dust settling. It must be noted that specifics as to what type of dust suppressant (grey water vs. chemical dust suppressant) that will be utilised as part of the proposed development was not available at the time of assessment. Should this detail become available, it is recommended that the freshwater ecologist provide a statement on the suitability of the use of the proposed dust suppressant;* • *The freshwater features outside the construction footprint not having authorised road crossings must be considered as no-go areas. No construction vehicles, nor construction personnel or vehicles may traverse through these freshwater features (except on approved road crossings);* • *As far as possible, existing roads must be utilised to gain access to sites;* • *Contractor laydown areas, and material storage facilities to remain outside of the freshwater features and their associated 100 m NEMA / GN509 ZoR as it would also help the proponent avoid the LN3 activities triggered within 100 m of watercourses;* • *All vehicle re-fuelling is to take place in specifically designated re-fuelling areas that*	
REMOVAL OF VEGETATION AND ASSOCIATED DISTURBANCES TO SOILS	Earthworks could be potential sources of sediment, which may be transported as runoff into the downgradient freshwater ecosystem areas; Exposure of soils, leading to increased runoff, and erosion, and thus increased sedimentation of the freshwater features; Increased sedimentation of the freshwater features, leading to smothering of the vegetation associated with the freshwater features; and Proliferation of alien and/or invasive vegetation as a result of disturbances. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to disturbance of aquatic habitats as no known construction activities are present on site.*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **MODERATE -**		**LOW -** **LOW -**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
				must be located outside of the 100 m NEMA / GN509 ZoR; and' • *No vegetation may be removed from the 100 m ZoR surrounding the freshwater features where no infrastructure is planned, as this provides a natural buffer zone around the freshwater features which plays a role in dispersing surface runoff into the freshwater features, and thus prevents sedimentation and erosion thereof.*	
REMOVAL OF VEGETATION AND TOPSOIL AND ASSOCIATED STOCKPILING; GROUND-BREAKING AND EARTHWORKS RELATING TO FOUNDATIONS AND TRENCHES; MIXING AND CASTING OF CONCRETE FOR CONSTRUCTION PURPOSES; BACKFILLING OF EXCAVATED AND DISTURBED AREAS; AND MISCELLANEOUS ACTIVITIES BY CONSTRUCTION PERSONNEL	Earthworks could be potential sources of sediment, which may be transported as runoff into the downgradient freshwater ecosystem areas; Disturbances of soils leading to increased alien vegetation proliferation within the terrestrial buffer zone surrounding the freshwater features, with the potential to affect the freshwater habitat; Altered runoff patterns within the local catchment of the freshwater features, potentially leading to increased erosion and sedimentation of the receiving freshwater environment; Potential impacts on the water quality of surface water runoff (when present) which may potentially enter the downgradient freshwater features and contamination of soils due to concrete casting; and Potential of backfill material entering the freshwater features, increasing the sediment loads therein. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **MODERATE -**	• *Though the proposed turbines are located outside the 100 m GN509 Zone of Regulation, indirect impacts to the receiving freshwater environment are likely during construction, particularly on the freshwater features located downgradient of the turbines. As such appropriate mitigation measures are provided.* • *The contractor laydown areas, material storage facilities, and the O&M building (if applicable) must remain outside of the freshwater features. It is also strongly recommended that these be located outside the 100 m NEMA / GN509 ZoR of the freshwater features. This in itself is considered a mitigation measure which complies with the mitigation hierarchy as advocated by the DFFE et al. (2013).* • *With regards to ground-breaking activities outside the delineated extent of a freshwater feature:* ○ *During excavation activities, the topsoil and vegetation must be*	**LOW -** **LOW -**

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	developer and the EMPrs will be prepared to the same standard. *No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.*			*stockpiled separately from other material outside the delineated extent of the freshwater features;* ○ *Excavated materials must not be contaminated, and it must be ensured that the minimum surface area is taken up by any stockpiled materials. The mixture of the lower and upper layers of the excavated soil must be kept to a minimum, so as for later use as backfill material after construction has commenced;* ○ *All exposed soils must be protected from wind using tarpaulins for the duration of the construction phase to prevent potential erosion and sedimentation of the freshwater features;* ○ *Suitable drainage must be insured along the turbine foundations, in order to ensure that water does not pond or drain in a concentrated manner into the nearby freshwater features. This must be considered as part of the stormwater management plan and be overseen by the Environmental Control Officer (ECO);* ○ *Construction of the proposed surface infrastructure may result in disturbance to the natural buffer zone surrounding the freshwater features which may result in the*	

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				reduction of surface roughness. This can be mitigated by ensuring that no concentrated runoff from the surface infrastructure construction areas enter the freshwater features by installing silt traps or placing haybales down gradient of the construction footprint (until suitable basal vegetation cover has been restored) to ensure no sediment laden or concentrated runoff generates from the construction footprint; and ○ *It is highly recommended that an alien vegetation management plan be compiled during the planning phase and implemented concurrently with the commencement of construction.* ➢ *With regards to concrete mixing on site:* ○ *Concrete and cement-related mortars can be toxic to aquatic life. Proper handling and disposal must minimise or eliminate discharges into the freshwater features. High alkalinity associated with cement, can dramatically affect and contaminate both soil and ground water. The following measures must be adhered to:* ○ *Fresh concrete and cement mortar must not be mixed near the freshwater features. Mixing of*	

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				cement may be done within the construction camp, however, may not be mixed on bare soil, and must be within a lined, bound or bunded portable mixer. Consideration must be taken to use ready mix concrete; ○ *No mixed concrete shall be deposited directly onto the ground within the freshwater features (outside of the designated area) or associated riparian habitat. A batter board or other suitable platform/mixing tray is to be provided onto which any mixed concrete can be deposited whilst it awaits placing;* ○ *A washout area must be designated outside of the freshwater features, and wash water must be treated on-site or discharged to a suitable sanitation system;* ○ *Cement bags must be disposed of in the demarcated hazardous waste receptacles and the used bags must be disposed of through the hazardous substance waste stream and* ○ *Spilled or excess concrete must be disposed of at a suitable landfill site. Chain of custody documentation must be provided.* • *With regards to backfilling of excavated areas:*	

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				○ *Stockpiled material must be used as backfill material;* ○ *All excavated areas must be backfilled to the natural ground level with excavated material; and* ○ *Soil must be suitably compacted, and all construction material must be removed from the site upon the completion of construction or used in the rehabilitation process.* • *Rehabilitation of the construction footprint areas:* ○ *All footprint areas which have been compacted must be ripped and revegetated with indigenous vegetation as soon as the construction activities have been completed. This will prevent soil erosion and the creation of gullies within the operational area; and* ○ *The operational area must regularly be inspected for alien and invasive vegetation species which might have established due to the construction activity related disturbances.*	
CREATION OF NEW ROAD CROSSINGS WITHIN THE SOUT RIVER AND THE LOWER FOOTHILL TRIBUTARIES ASSOCIATED WITH	Earthworks and exposure of soil could result in sedimentation of the freshwater features, which may be transported as runoff into the downstream freshwater ecosystem areas and may smother vegetation associated with the freshwater features; Altered water quality (if surface water is present) as a result of vehicle movement and construction	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **HIGH -**	• *It is imperative that all construction works be undertaken during the dry periods when there is no flow within the freshwater features, and thus no diversion of flow would be necessary. It is also recommended that existing crossings through freshwater features be prioritised for upgrading rather*	**LOW -** **LOW -**

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THE KLEIN BRAK AND SOUT RIVER SYSTEMS **AND** **CREATION OF NEW ROAD CROSSINGS WITHIN THE MOUNTAIN STREAM DRAINAGE LINES (NO RIPARIAN VEGETATION) AND UPPER FOOTHILL TRIBUTARIES (NO RIPARIAN VEGETATION) ASSOCIATED WITH THE KLEIN BRAK AND SOUT RIVER SYSTEMS**	activities; and Proliferation of alien and/or invasive vegetation as a result of disturbances. *Cumulative impact, on a localised scale, would be high should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to disturbance of aquatic habitats as no known road work activities are present on site.*			*than development of new crossings, where possible;* • *The throughflow structures must be designed to ensure that the structures are geotechnically sound and that they are hydraulically stable, even if a 1:100 year flood event was to occur. The designs must include culverts installed intermittently to ensure a free draining landscape. It is recommended that a suitably qualified hydrologist be consulted to provide guidance on the relevant sizes and width requirements to ensure that hydraulic functioning of the system is maintained;* • *In addition, the crossings must be designed such that should they be overtopped, they remain stable and do not lead to excessive downstream erosion and incision. It must be ensured that the final design accounts for appropriate wetting frequencies and patterns are maintained in the pre-development condition (with input from the freshwater ecologist, where necessary);* • *The reaches of the freshwater features where no activities are planned to occur must be considered no-go areas. These no-go areas can be marked at a maximum distance of 5 m upstream and downstream of the proposed road upgrade crossing. This 5 m construction Right of Way would allow for construction personal, vehicles (if applicable) to enter the freshwater feature crossing where the road is proposed to be constructed;*	

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				• *The clearing of vegetation within the footprint area must be kept to a minimum to avoid unnecessary disturbance within the active channel;* • *The removed vegetation must be stockpiled outside of the delineated boundary of a freshwater feature. The footprint areas of these stockpiles must be kept to a minimum, and may not exceed a height of 2 m. Should the vegetation not be suitable for reinstatement after the construction phase or be alien/invasive vegetation species, all material must be disposed of at a registered garden refuse site and may not be burned or mulched on site;* • *See impact below with regards to excavation and soil compaction activities within the freshwater features.* • *See impact above for control measures specific to concrete works.*	
SITE PREPARATION PRIOR TO CONSTRUCTION ACTIVITIES; REMOVAL OF VEGETATION AND ASSOCIATED DISTURBANCES TO SOIL; DISTURBANCES TO SOIL OF THE FRESHWATER FEATURES; MOVEMENT OF	Earthworks and exposure of soil could result in sedimentation of the freshwater features, which may be transported as runoff into the downstream freshwater ecosystem areas and may smother vegetation associated with the freshwater ecosystem areas; and Proliferation of alien and/or invasive vegetation as a result of disturbances. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **HIGH -**	• *The construction footprint must be limited to a construction Right of Way that comprises a 5 m construction buffer (upstream and downstream of the freshwater ecosystem crossing) only.* • *Upgrading of the informal roads must take cognisance of the delineated extent of the freshwater feature traversed by the existing informal access road and that located within close proximity to the road. Should the road be increased in width, the road must be expanded on the side opposite of a freshwater feature, to ensure that the*	**LOW -** **LOW -**

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CONSTRUCTION MACHINERY/ VEHICLES WITHIN THE FRESHWATER FEATURES; AND POSSIBLE SPILLS / LEAKS FROM CONSTRUCTION VEHICLES.	*associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to disturbance of aquatic habitats as no known construction activities are present on site.*			*remaining natural buffer between the access road and the freshwater feature remains intact;* • *Material to be used (gravel – if applicable) as part of the upgrading of the existing roads must be stockpiled outside the delineated extent of the freshwater features (preferably at least 32 m from the freshwater feature) to prevent sedimentation thereof and to avoid any other vegetation being impacted by the construction activities. These stockpiles may not exceed a height of 2 m and must be protected from wind using tarpaulins;* • *The disturbed area surrounding the road must be revegetated with suitable indigenous vegetation to prevent the establishment of alien vegetation species and to prevent erosion from occurring;* • *The alien vegetation management plan as compiled by the terrestrial/botanical ecologist is highly recommended and supported by the freshwater specialist and must be implemented concurrently with the commencement of construction; and* • *All existing alien and invasive vegetation must be removed. All material must be disposed of at a registered garden refuse site and may not be burned or mulched on site.* • *With regards to excavation and soil compaction activities within the freshwater ecosystems (including that associated with the installation of underground cabling)* • *Although the proposed freshwater*	

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				ecosystems crossings upgrades are associated with generally existing farm roads, and as such the most significant impacts have already occurred, the existing gravel roads are relatively small with no formal through flow structures in most cases. The following are applicable with regards to excavation works and any concrete related activities: • *During the excavation activities, any soil/sediment or silt removed from the freshwater feature may be temporarily stockpiled in the road reserve but outside the delineated extent of the freshwater feature. These stockpiles may not exceed 2 m in height, and their footprint must be kept to a minimum. Stockpiling of removed materials may only be temporary (may only be stockpiled during the period of construction at a particular site) and must be disposed of at a registered waste disposal facility;* • *During trenching activities, seepage water may be present within the trench -invariably this will be filled with silt and be muddy. Therefore, any seepage must not be discharged straight into the river channel but through a silt trapping area first before entering the downstream reach;* • *Excavated materials must not be contaminated, and it must be ensured that the minimum surface area is taken up. Mixture of the lower and upper layers of the excavated soil must be kept to a minimum,*	

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				for later usage as backfill material or as part of rehabilitation activities; • *For trenching of the cables, the topsoil must be stored separately and may not be contaminated. Furthermore, the soil layers must be placed in the same order and the topsoil returned last;* • *Care must be taken to ensure that no scouring or erosion occurs as a result of the proposed culvert crossing. Installation of riprap or gabion mattresses and/or concrete aprons associated with any culverts;* • *All construction material (with specific mention of prefabricated culvert structures) must be stockpiled in the laydown area and must only be imported to the construction site when required;* • *Machinery/vehicles used to install culvert structures must be parked on the existing road surface and may not enter the freshwater features; and* • *Reno-mattresses or riprap must be installed at the outlet side of the culvert/bridge structures to ensure energy dissipation and prevent concentrated runoff into the downstream freshwater feature. The reno mattress/riprap must be installed flush with the culvert outlet.* • *See impact 3 above for control measures specific to concrete works.*	
AVIFAUNAL IMPACT ASSESSMENT					
HABITAT DESTRUCTION	With the current proposed layout of up to 40 turbines and associated infrastructure such as roads, laydown	**DIRECT**	**LOW -**	• *The constraint areas identified by this study (which build on those identified in the*	**LOW -**

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	areas, collector substations etc, the wind farm could impact on approximately 160 hectares of habitat for clearing. Given the relatively undisturbed nature of vegetation on site, most of this is likely to be natural vegetation. This is a small proportion of the overall site extent, and the habitat is neither particularly unique, nor threatened, or in limited availability. However, the fragmented nature of the remaining habitat will experience an "edge effect", whereby an area greater than the exact footprint of construction is affected by the impact under consideration. Of course, the effect on the avifaunal community is not as simple as the surface area affected. In addition to surface area alteration, the effect of large, dispersed infrastructure projects such as wind farms on birds is likely to be far more complex through factors such as habitat fragmentation, disruption of territories and other factors. These effects have however proven extremely difficult to measure. Since this habitat destruction is largely unavoidable, and our confidence in the effectiveness of habitat rehabilitation is uncertain, we anticipate that the impact significance will remain unchanged by mitigation.	**CUMULATIVE** **NO-GO**	**LOW -**	*screening phase) should be adhered to.* • *A pre-construction avifaunal walk down should be conducted to confirm final layout and identify any sensitivities that may arise between the conclusion of the EIA process and the construction phase.* • *All human activities associated with construction, operation and decommissioning should be strictly managed according to generally accepted environmental best practice standards, so as to avoid any unnecessary Impact on the receiving environment.* • *Use should be made of existing roads as far as possible.* • *All staff, vehicle and machinery activities should be strictly controlled at all times so as to ensure that the absolute minimum of surface area is impacted.* • *Care should be taken not to introduce or propagate alien plant species/weeds during construction.* • *Any underground cabling should follow roads at all times to reduce the impact on the habitat by grouping these linear infrastructures.* • *Should more than one power line be constructed in parallel with another either new or pre-existing power line, the pylon structures should be staggered as per Pallett et al. (2022) to increase visibility to large, slow-moving species, especially bustards and cranes.*	**LOW -**
HABITAT DISTURBANCE	Effects of disturbance on birds are particularly likely during breeding and could include loss of breeding productivity; temporary or permanent abandonment of breeding; or even abandonment of nest site. The avoidance measures (in the form of large No-go buffers) already taken to protect the various eagle nests and their breeding have reduced the significance of this impact to Low Negative significance pre-mitigation and it will remain Low	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**		**LOW -** **LOW -**

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	Negative post-mitigation.				
BAT IMPACT ASSESSMENT					
MODIFICATION OF BAT HABITAT (ROOSTING, FORAGING, COMMUTING)	Vegetation clearing for access roads, turbines and their service areas and other infrastructure, as well as noise and dust generated during the construction phase, will negatively and indirectly impact bats by removing habitat used for foraging and commuting, through disturbance, and displacement (Kunz et al. 2007b, Millon et al. 2018, Bennun et al. 2021). This impact is likely to have species specific effects; clutter edge species (e.g., Cape serotine) are more likely to be impacted by habitat modification given their greater association with physical habitat features compared to high-flying species (e.g., Egyptian free-tailed bat). Construction of WEF infrastructure could result in destruction (direct impact) of bat roosts (rocky crevices, buildings) and disturbance (indirect impact) of bat roosts potentially resulting in roost abandonment. Bat mortality can occur if roosts which contain bats are destroyed. Installation of new infrastructure in the landscape (e.g., buildings, turbines, road culverts) can inadvertently provide new roosting spaces for some bat species, attracting them to areas with wind turbines and potentially increasing the likelihood of collisions. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same*	**DIRECT AND INDIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **HIGH -**	***Avoid:*** • *Limit potential for bats to roost in project infrastructure (e.g., buildings, turbines, road culverts) by ensuring they are properly sealed such that bats cannot gain access.* • *No construction activities at night. No placement of infrastructure (except roads) in no-go areas.* ***Minimise:*** • *Minimise clearing of vegetation, minimise disturbance and destruction of farm buildings on site, minimise removal of trees, minimise disturbance and destruction of rocky outcrops, and where this is required, these features should be examined for roosting bats. This study assumes that all buildings and rocky outcrops are potentially roosts and must be buffered since numerous species use these features for roosting.* • *Apply good construction abatement control practices to reduce emissions and pollutants (e.g., noise, erosion, waste) created during construction.* ***Restore:*** *Rehabilitate all areas disturbed during construction (including aquatic habitat).*	**MODERATE -** **MODERATE-**

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	developer and the EMPrs will be prepared to the same standard. *No-go alternative would result in no impact related to disturbance of bat habitats.*				
HERITAGE IMPACT ASSESSMENT					
LOSS OF HERITAGE RESOURCES: STONE AGE OCCURANCES	Construction activities pose the greatest threat to tangible heritage resources within the cultural landscape and it is often during this Phase that heritage sites are lost. Previously undetected cultural (archaeological) layers are usually superficial, subsoil layers and that makes them easily vulnerable to destruction and the likelihood for encountering additional cultural heritage sites as the land clearing process commences, or during construction of infrastructure should be considered. *Cummulative impact:* *The low frequency of significant archaeological resources documented in the project area and in its immediate surroundings implies low-severity short and long-term impacts on the heritage landscape* *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to destruction of archaeological resources.*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	• *Stone Age remains occur abundantly in the project landscape where locally available raw material for the manufacture of stone tools is available in the geological setting. Most of the artefacts are probably Middle Stone Age (MSA) lithics such as blades, scrapers, chunks and cores produced on quartzite. Single possible Later Stone Age (LSA) microlithic tools were noted. Stone artefact scatters are usually located in areas with fluvial gravels along drainage lines, pans and within decomposing calcretes, rocky outcrops or ridges. Despite the high number of observations of artefacts, these resources are common and representative of similar scatters across widespread areas of the Karoo. The widespread but ephemeral scatters are often of low heritage value due to temporally mixed contexts and the frequent absence of faunal, organic and other cultural remains which is scattered over thousands of square kilometres of the Karoo. The Stone Age localities are not conservation-worthy and even though the resources may be destroyed during construction, the impact is inconsequential.*	**LOW -** **LOW – AND LOW (+)**
LOSS OF HERITAGE RESOURCES:	S ignificant archaeological resources such as a rock shelter (SRC02)and a corbel building (SRC01) may be	**DIRECT**	**MODERATE -**	• *A small rock shelter containing cultural remnants is situated south east of turbine*	**MODERATE -**

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ROCKSHELTER (SRc02) AND CORBEL BUILDING (SRC01)	damaged during the construction phase. *Cummulative impact:* *The low frequency of significant archaeological resources documented in the project area and in its immediate surroundings implies low-severity short and long-term impacts on the heritage landscape* *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to destruction of archaeological resources.*	**CUMULATIVE** **NO-GO**	**LOW -**	*position T25 and in the general vicinity of planned access roads (SRS14). The site has potential to yield valuable archaeological information on the regional development of the LSA and it has been assigned a medium archaeological significance. It is recommended that a 100m no-go development buffer be demarcated with a fence or construction barricade during the Preconstruction Phase. Continuous site monitoring should be done in order to detect potential impact on the site at the earliest opportunity. Should impact on the site proof inevitable, a Phase 2 Assessment inclusive of site documentation, possible sampling and analysis must be conducted during the Preconstruction Phase. The necessary destruction permits from the relevant Heritage Resources Authorities should be obtained prior to site impact and destruction.* *The collapsed remains of dry-stone walling were noted at a number of localities in the project area (SRS16, SRS17, SRS21, SRS36). No material culture or artefacts were noted at these wall remains. Similar features occur widespread across the landscape and the remains do not hold unique cultural or historical attributes. The occurrences are rated as low heritage significance and general site monitoring should be conducted during all stages of the project in order to detect the presence of previously*	**LOW – AND LOW (+)**

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				undocumented heritage resources the earliest opportunity. • *A number of elongated stone cairns possibly indicating human burials occur north west of turbine position T27 and in close proximity of proposed access roads (SRS11). The potential burial site, which is of high heritage significance, occurs in close proximity of project development areas and it is recommended that a 100m no-go development buffer be demarcated with a fence or construction barricade during the Preconstruction Phase. Frequent and continuous site monitoring should be done during all stages of the project in order to detect potential impact on the site at the earliest opportunity.* • *Information on the layout of civil services such as access roads were made available to specialists at an advanced stage of this assessment and not all of these proposed access road alignments could be included in site investigations. It is recommended that a suitably qualified archaeologist be appointed during the Construction Phase to monitor vegetation clearing and excavation activities for the possible occurrence of archaeological material remains and features in these areas.* • *Considering the localised nature of heritage remains, the general monitoring of the development progress by an ECO or by the heritage specialist is recommended for all stages of the project. Should any subsurface*	

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				palaeontological, archaeological or historical material, or burials be exposed during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately.	
NOISE IMPACT ASSESSMENT					
CONSTRUCTION NOISE: DAYTIME	Daytime ambient sound levels could range from 35 dBA to more than 72 dBA, averaging at 45 dBA. Daytime ambient sound levels are thus typical of a rural noise district most of the times, though it is expected that introduced noises will be audible over large distances during quiet periods (during low wind conditions). Various construction activities (development of access roads, laydown areas, the hard standing areas, excavation of foundations, concreting of foundations and the erection of the wind turbines, other infrastructure) taking place simultaneously during the day will increase ambient sound levels due to air-borne noise. Depending on the location of access roads, traffic noises may be audible during passing and could change the ambient sound levels at NSR staying within 100m from (potential) access routes. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	*The significance of the noise impact is low for daytime construction activities and no additional mitigation is required or recommended. General measures are recommended to ensure that annoyance with the project is minimised. It is therefore recommended that the applicant plan process access roads t pass further than 60m from residential dwellings of the identified NSR.*	**LOW -** **LOW -**

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	important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would result in no impact related to daytime construction noise.*				
CONSTRUCTION NOISE: NIGHTTIME	Night-time ambient sound levels could range between 27 dBA to more than 64 dBA, averaging at 41.9 dBA. Night-time ambient sound levels are higher than expected for a rural noise district, but this is likely due to the measurement period taking place during a period with increased wind speeds, resulting in more wind-induced noises. Ambient sound levels are expected to be low during period of low winds, and it is expected that introduced noises will be audible over large distances during quiet periods (during low wind conditions). Various construction activities (likely limited to the pouring of concrete as well as erection of WTG components) taking place simultaneously at night will increase ambient sound levels due to air-borne noise, using the criteria of the author. The projected noise levels, the change in ambient sound levels as well as the potential noise impact is defined per NSR. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	*The significance of the noise impact is low and additional mitigation is not required, yet some general management measures are included to ensure that the potential annoyance that may be created due to night-time construction noises are minimized. Potential mitigation measures would include:* ○ *Minimizing night-time activities when working within 2,000m from any NSR. Work should only take place at one WTG location to minimize potential night-time cumulative noises (when working at night within 2,000m from NSR);* ○ *The applicant must notify the NSR when night-time activities will be taking place within 1,000m from the NSR; and* ○ *The applicant must plan the completion of noisiest activities (such a pile driving, rock breaking and excavation) during the daytime period (even though it is expected that it is highly unlikely that this may take place at night).*	**LOW -** **LOW -**

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	No-go alternative would result in no impact related to night-time construction noise.				
PALAEONTOLOGICAL IMPACT ASSESSMENT					
LOSS OF PALAEONTOLOGICAL HERITAGE RESOURCES	Disturbance, damage, destruction or sealing-in of legally protected, scientifically valuable fossil remains preserved at or beneath the ground surface within the development footprint, especially during ground clearance or bedrock excavations during the Construction Phase. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to loss of palaeontological resources.*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	*Impact severity can be effectively (albeit only partially) mitigated through:* • *Pre-construction walk-down of authorized project footprint by specialist palaeontologist in the Pre-Construction Phase* • *Ongoing monitoring for fossil remains of all substantial bedrock excavations and surface clearance activities by ECO during Construction Phase, with safeguarding and reporting of new palaeontological finds (notably fossil vertebrate bones & teeth) to SAHRA for possible specialist mitigation (See appended Chance Fossil Finds Protocol).* *Low Negative impact may also be partially offset by professional recording and collection of new fossil finds, which may be a compensatory positive outcome.* • *Cumulative impacts: Anticipated cumulative impacts on local palaeontological heritage fall within acceptable limits based largely on the paucity of significant fossil sites recorded hitherto within the combined cluster project area and assumes that the proposed Pre-Construction and Construction Phase mitigation measures recommended for all these projects are implemented in full.*	**LOW -** **LOW -**
RIVERINE RABBIT IMPACT ASSESSMENT					
MORTALITY FROM	The probability of vehicle-related mortality will	**DIRECT**	**MODERATE -**	• *Careful planning of roads to minimise the*	**LOW -**

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ROAD COLLISION, BUSHMEAT HUNTING AND OTHER CONSTRUCTION RELATED ACTIVITIES	increase with the added traffic. This would potential be within the site as well as on the larger public roads to the site such as the R381. This impact is likely to be of highest concern during construction but is also expected during operational phase. Roadkill is a significant source of mortality for riverine rabbits across their range. It is possible that the increase in traffic associated with construction would increase the probability of roadkill. As riverine rabbit activity is 'crepuscular' (i.e., highest between dusk and dawn), traffic during these periods should be curtailed. In addition, speed limits (<40km) in areas of potential conflict (High sensitivity) can be implemented as this reduces collision risk, and a reduction of roads within the drainage should be considered. Bushmeat hunting and active interference with Riverine Rabbits by construction employees may also result in reduced Riverine Rabbit occurrence within the AoI All employees should be educated thoroughly on the potential impact of hunting in the AoI, and encouraged to report any sightings of the species during construction to their line managers. *Cumulative impact, on a localised scale, would be high should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on the local Riverine Rabbit population.*	**CUMULATIVE** **NO-GO**	**MODERATE -**	*length of roads traversing through riverine habitats that have been identified as Very high or high sensitivity.* • *Use existing roads as much as possible.* • *An ECO must be employed to demarcate areas for use during construction, and to ensure that the construction activities remain within the designated area and that no unauthorised activities occur outside of the construction footprint.* • *Implementation of speed limits on both internal access WEF roads (40km/h) as well as external public roads (60km/h).* • *Reduced speed limits of 40km/h where roads (both internal and external) cross High and Very high sensitivity areas identified.* • *Wildlife warning signage and speed reduction measures where roads cross High and Very high sensitivity areas.* • *There is higher risk of collision when riverine rabbits are active which is typically from late afternoon to early morning. Traffic should be reduced during the early hours of the morning (04:00 – 09:00) and early evening (18:00 – 22:00). During these times a low speed limit (40km/h) needs to be implemented.* • *Night-time driving should be avoided as much as possible but if necessary, speed needs to be reduced significantly to avoid collisions. Lagomorph species (hares and rabbits) often freeze in headlights and require headlights to be momentarily turned off to allow the animal to move off the road.*	**LOW -**

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				▲ *Reduced speeds (40km/h) also need to be implemented during reduced visibility such as misty conditions that have been observed on the site.* ▲ *Roadkill monitoring program needs to be implemented on both internal and external public roads targeting sensitive habitats and wildlife corridors. The program must be initiated at pre-construction phase and continued during construction and post-construction as well as conducted over different seasons.* ▲ *Assess efficiency of roadkill mitigation approaches via a post-implementation roadkill monitoring program.* ▲ *Education and awareness campaigns on riverine rabbits and their habitat must form part of staff induction procedures to help increase awareness, respect and responsibility towards the environment for all staff and contractors.* ▲ *Any contractor employed for development work must ensure that no rabbit or hare species are disturbed, trapped, hunted or killed by them and their team during the construction phase. Conservation-orientated clauses should be built into contracts for construction personnel, complete with penalty clauses for non-compliance.* ▲ *Inductions on safe wildlife passing and driving to reduce possible injury and roadkill alongside roads.* ▲ *Induction must include reporting of any*	

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				vehicle/wildlife collision or found roadkill to the appointed Roadkill monitoring personnel. • *Any trenches built must have slopes that allow any dispersing rabbits that fall in to escape and must be backfilled.* • *Prohibit all employees from hunting;* • *Prohibit open fires.*	
LOSS OF HABITAT	The construction of roads, turbine hard-stands, roads and laydown areas will result in elevated levels of both noise and activity, which may displace potential Riverine Rabbits out of the AoI. Mitigation should include minimizing noise and educating workers. If done, the potential displacement of the species from home range is likely to be very low. As there are limited areas of potentially suitable Riverine Rabbit on the site, this would be a largely minimalised, thus requiring minimal mitigation. *Cumulative impact, on a localised scale, would be high should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on the local Riverine Rabbit population.*	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **HIGH -**	• *Locate developments away from identified sensitive habitats for riverine rabbits, this includes no go zones and buffer zones for turbine pads, electrical substations and housing facilities as well as construction laydown areas.* • *Minimize project footprint by utilizing existing roads and disrupted areas as much as possible.* • *Careful planning of road layout to minimise the length of roads traversing riparian areas that have been identified as Very high or high sensitivity which may create barriers and fragment habitats.* • *An ECO must be employed to demarcate areas for use during construction, and to ensure that the construction activities remain within the designated area and that no unauthorised activities occur outside of the construction footprint.* • *Implement adequate dust control and erosion control.*	**LOW -** **LOW -**
DISTURBANCE THROUGH CONSTRUCTION	The construction of roads, turbine hard-stands, roads and laydown areas etc. will result in noise and activity, which may displace rabbits out of home ranges. Noise effect from construction and associated human	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **HIGH -**	• *Construction must occur outside of identified sensitive habitats for riverine rabbits, this includes no-go zones and buffer zones for turbine pads, electrical substations and*	**LOW -** **LOW -**

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	activities during this phase is highly probable and will likely reduce once the WEF is operational. Mitigation should include minimizing noise and educating workers. The buffered sensitive habitats will also ensure construction and associated disturbance noise is likely negligible. As a result, once mitigations are applied the potential disturbance and/or displacement of the species from home range is likely to be low. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on the local Riverine Rabbit population.*			*housing facilities as well as construction laydown areas.* • *An ECO must be employed to demarcate areas for use during construction, and to ensure that the construction activities remain within the designated area and that no unauthorised activities occur outside of the construction footprint.* • *Implementing adequate noise reduction measures where possible on machinery.* • *Minimize noise disturbance during constructions by restricting noise to day time (9am – 5pm) periods when rabbits are less active.* • *Ensure the construction phase is done in as a short period as possible.*	
SOCIO-ECONOMIC IMPACT ASSESSMENT					
TEMPORARY EMPLOYMENT	During the construction phase, there will be temporary employment associated with the project. It has been established that approximately 250 employment opportunities will become available over the 24-month construction period. Of these about 55% will be allocated to unskilled, 30% to semi-skilled and 15% to skilled workers. Semi- and lower skilled workers are usually required to perform electrical and civil duties (site clearing, excavation and casting of concrete foundations, stormwater reticulation, trenching, access roads, cable installations, structural steelwork, buildings, fencing, etc.); whereas higher skilled professionals entail	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE +** **HIGH +**	• *Maximise local employment and local content (the Project's direct sending area) through the Preferential Procurement Plan and Contractor Services Management Plan (CSMP) for all contractors that are used.* • *Involve the Ubuntu LM and PKSDM from the early processes (from financial close already if possible). Determine their existing processes with regards to a labour desk and streamline employment processes between the various stakeholders.* • *Appoint a Community Employer Relations Officer / CLO. Communicate with*	**MODERATE +** **HIGH +**

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	Project Managers, Engineers, Environmental Control Officers and so forth. In addition to direct employment, the construction phase will have a positive spin-off effect on the economy (local, regional and national) through procurement of goods and services, with indirect and induced employment creation as result. *Cumulative impact, on a localised scale, would be HIGH should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would not impact the SEIA ratings significantly.*			*communities through this one channel to ensure transparency, limit unrealistic expectations and to avoid conflict.*	
LOCAL PROCUREMENT	In order to meet or better targets set by the DMRE, the Developer is aiming for approximately 40% of total capital expenditure to be local. It is anticipated that many of the high-technology turbine components would be imported and that other technical components will be sourced from larger industrial areas in other parts of the province / country. Even though the Preferential Procurement Policy will only be formulated closer to the time, positive impacts on local and national economies are 'definite' since 25% of the DMRE scorecard is based on local content. *Cumulative impact, on a localised scale, would be*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE +** **HIGH +**	▲ Maximise local content of procurement by procuring from the local and regional study areas as far as possible. ▲ Do a value-chain analysis of services required (directly and indirectly related to construction such as transport, laundry, catering, etc.). Communicate this to the PKSDM and Ubuntu LED Units at least 4 months prior to the tender process commencing in order for SMME's to prepare. ▲ Include minimum thresholds in the CSMP for local employment, BBEEE procurement, SMME targets, local services providers, etc.	**MODERATE +** **HIGH +**

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	HIGH should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would not impact the SEIA ratings significantly.*				
INDUCED LOCAL ECONOMIC IMPACTS	Expenditure during construction and the increase in household earnings due to temporary employment result in various induced economic impacts and spin-offs for the local and regional economies, such as: Business opportunities for the service and manufacturing industries (locally and nationally), e.g. transport, Personal Protective Equipment, maintenance work, general consumables, civil works; • Wages that are spent locally and a general improvement of income levels with higher spending benefits and spin-offs for local businesses, retail, sales, leisure and hospitality, real estate, etc.; • Local accommodation facilities that house the workers sourced from outside the direct Project sending area and spin-offs for the tourism industry. Since at least 20% of the South African workforce has to be residents from local communities a large portion of these induced impacts will manifest locally. Definite positive impacts of 'low significance' will manifest. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW +** **LOW +**	• Maximise the Project's local content as far as possible.	**LOW +** **LOW +**

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	construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would not impact the SEIA ratings significantly.*				
TRAINING / SKILLS DEVELOPMENT	An important outcome of training and skills development is that it increases the employability of a region's workforce, resulting in enhanced economic opportunities and thus addressing poverty alleviation over the medium to long term. During the construction phase the following training initiatives would usually take place: • On-site training so that workers can safely perform their duties; and • Training by contractors to maintain their own BBEEE level, such as health and safety legislation training, first aid, fire-fighting, construction skills, basic electrical training, quality management, legal compliance or business skills. Consultation with the affected local and district municipalities however identified a great need for training and capacity building as most of the workers and SMME's on their databases are poorly educated with limited skills. These constraints result in gaps between the Developers' requirements and the local communities' / SMME's abilities to provide the required services. It would thus be to the advantage of the Project if on-the-job training is implemented, especially for unskilled workers. *Cumulative impact, on a localised scale, would be low*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW +** **MODERATE +**	• Where feasible, the Developer should: • Make the skill requirements clear to the municipalities in advance and do a skills analysis of the available labour force. • Implement a SMME skills development programme and do certification (training on how to tender, understanding contracts, basic business skills, etc.) at least 4 months prior inviting SMMEs to tender and involve the relevant LED Units in the programmes. • Do a Value-chain analysis of services required (directly and indirectly related to construction) and communicate this to local and district municipalities in advance so that they are prepared and equipped to take part in the tender process. • Require larger contractors to work with small SMMEs to train and transfer skills and include this in their respective CSMP's. • Implement on-the-job training for unskilled workers. • Capacitate the local government structures by involving them as early as possible in the Project; remain transparent throughout the processes.	**MODERATE +** **MODERATE +**

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	should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would not impact the SEIA ratings significantly.*			• Negotiate a MoU with the municipalities so that each role-player is clearly aware of its roles, responsibilities and timelines in the Project processes. • Establish an EMC or similar Forum for the duration of construction to aid communication and transparency. Members of the EMC / Forum to meet on a quarterly basis to discuss issues that may arise during the course of the construction period (if feasible).	
EMPLOYMENT EQUITY	Statistics obtained from the IP4 overview (DMRE, December 2021) indicate that during the construction phases, Black South African citizens, Youths and rural local communities have primarily been the beneficiaries of RE projects, as they respectively represent 81%, 44% and 48% of total job opportunities created by IPP's to date. However, woman and the disabled could still be significantly empowered as they represent a mere 10% and 0.4% of total jobs created. Pre-mitigation positive impacts of employment equity will hold benefits of 'low overall significance' if only the DMRE's minimum requirements are implemented. With mitigation, the intensity of the impact will increase, and the overall significance can be increased to hold 'moderate benefits'. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW +** **LOW +**	• Obtain inputs from the local and district municipalities on the contents of the Procurement strategy and Employment Equity Plan to be implemented. • Set targets for the employment of Youth, women and the disabled in the respective CSMPs.	**MODERATE +** **MODERATE +**

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	associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would not impact the SEIA ratings significantly.*				
IMPACTS ASSOCIATED WITH AN INFLUX OF JOBSEEKERS / TEMPORARY CONSTRUCTION WORKERS	Negative impacts that could manifest for local communities and the local and district municipalities due to an influx of jobseekers / temporary construction workers include: Conflict between locals and 'outsiders' if the outside labour force receives preference; Conflict due to cultural differences; • Increase in the size and number of informal settlements and additional pressure on local government for housing and related services; • Increase in the unemployment rate if jobseekers and/or workers do no return to their places of residence post construction; • Unwanted pregnancies, an increase in HIV/AIDS and other sexually transmitted diseases (STDs) and additional pressure on health care services; • An increase in single parent households and a subsequent reliance on social grants; • An increase in drug and alcohol abuse and other social issues should unemployment levels increase. Poor conduct of construction workers and inadequate management of the construction site could result in health and safety risks for landowners that include: • Unauthorized access / trespassing resulting in theft, stock poaching, safety and security issues	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -**	Employment / Temporary construction workers: • Clearly identify the beneficiary communities / labour sending area and compile the employment strategy in collaboration with the affected municipalities' LED Units. • Contractually oblige contractors and sub-contractors to only source labour through the labour desk / job registration database and make this known to the target communities. • Work through limited communication channels (e.g. Ward Councillors and the Employer Relations Officer / CLO). • Be vigilant not to raise unrealistic expectations amongst the local communities and workers with regards to employment, skills requirements, local procurement and so forth. Ensure transparency through the Ward Councillors, CLO and the EMC / Forum. • No recruitment of temporary workers at the access to the construction site. • As part of their Social Management Plan's (SMP's), contractors to provide a transport and housing plan: (i) no workers are allowed to be housed on site or in informal housing / settlements; (ii) allow workers that do not live nearby time to return to their families at regular intervals or over weekends.	**LOW -** **LOW -**

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	as well as potential damage to the veld and natural grazing; - Fire hazards at the construction site and the possibility of fires spreading and damaging surrounding farmland and infrastructure; - Pollution problems, flies, rodents and pests and possible contamination of water resources (insufficient sanitation facilities, littering and refuse) and so forth. In terms of security, landowners and community members could easily consider this construction project as the catalyst should local crime levels and stock theft increase and affect their quality of life. Landowners in and around the study area describe their environment as extremely safe and peaceful with minimal / low levels of crime. Impacts that relate to an influx of construction workers would increase if contractors and sub-contractors refrain from using the labour desk and prefer to bring in their own workforce. The Developer's commitment to maximize local labour, design the recruitment process in conjunction with the municipalities and implement relevant security measures for the duration of construction is thus essential. *Cumulative impact, on a localised scale, would be MODERATE should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.*			- No workers to remain on site after shifts. - It is also recommended that the Developer embarks on a Social Awareness Campaign for the workforce that focuses on sexual health, unwanted pregnancies and related social issues. - Security, safety and environmental health: - 24-hour security, demarcate and fence the construction site (if possible), material stores to be secured, access control and no trespassing of workers outside designated construction areas. - Join the local community policing forum or similar initiative for the duration of construction. - Keep the local SAPS, other emergency services, Ward Councillors, landowners and other relevant stakeholders informed about the construction progress and time-lines. - Develop a Fire / Emergency Management Plan in conjunction with affected and neighbouring landowners. - Dispose of the various types of waste generated in the appropriate manner at licensed waste landfill sites at regular intervals. Comply with the waste management plan compiled for the construction phase. - Display "danger" warning signs and "no public access" signs at all potential accesses, paths and along the periphery of the construction areas in English and the local languages.	

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	No-go alternative would not impact the SEIA ratings significantly.			• If water for construction is obtained from a natural water resource, comply with the Water Use Licence conditions for the duration of the construction period. • Ensure implementation of the provisions of the Occupational Health and Safety Act No. 85 of 1993 and adhere to the Emergency and Safety plan procedures for the duration of the construction phase. • Awareness / community engagement: • Keep open communication channels with the landowners and address any potential issues as a matter of priority. • Make contact details of the main contractor and procedures to lodge complaints available to landowners and the local communities through the Ward Councillors and EMC / Forum. • Make a complaints register / log book available at the entrance to the construction site and act immediately should issues arise. • Consult with surrounding landowners whose livestock, private residences and other infrastructure could be affected by dust, noise and other impacts that result from traffic movement and general construction activities. • Where required, draw up a land use management plan with individual landowners to protect livestock and farmland, which addresses restricted access areas, procedures when farm gates are opened and closed and so forth.	

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				▲ Rehabilitate the veld to its original state post construction.	
LAND USE IMPACTS	Main land uses in the study area pertain to livestock farming (mainly sheep and goat) and grazing for game. The land has a long term grazing capacity of 24 to 28 hectares per large stock unit (LSU). Small patches of cultivation can be found along water courses and in close proximity to farmsteads. Farms are also used for residential and leisure purposes, albeit farmsteads are scattered and dispersed and the nearest farmstead is located about 1 km from a turbine. No direct impacts on residential land uses are therefore foreseen. For the duration of the short-term construction period no grazing is possible at the construction site/s. Should 32 turbines be constructed, the area cleared of vegetation for construction amounts to 124.68 ha (4.5 LSU), which has a negligible direct impact on grazing land uses. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would not impact the SEIA ratings significantly.*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	▲ Rehabilitate the veld to its original state post construction.	**LOW -** **LOW -**
INTRUSION IMPACTS	Intrusion impacts could indirectly impact agricultural land uses, thereby having a negative effect on	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -**	▲ *Comply with the EMPr requirements to address any potential noise and dust impacts.* ▲ *Proper planning, management and*	**MODERATE -** **MODERATE -**

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	incomes of landowners, such as: • Negligent construction workers that do not close / lock farm gates resulting in animals that go missing and/or mix with animals in different breeding groups / cycles, potentially introducing diseases into herds; • Livestock that is killed on access roads if drivers do not adhere to speed limits and traffic rules; • Dust that impact the quality of wool and/or dust that settle on grazing land and have an impact on livestock carrying capacity; • Possible noise impacts; and • Construction activities that hamper the farmers' access to their own farms. The increase in traffic could result in the degradation of road surfaces and speeding / negligent drivers could cause accidents and fatalities, subsequently placing pressure on local emergency, disaster management and health care services (fire, ambulance, police services, etc.). Abnormal vehicles that transport large project infrastructure could also necessitate intermittent road closures. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would not impact the SEIA ratings significantly.*			*rehabilitation of all construction sites to forego the visual impacts of the construction activities, as proposed in the VIA (Nuleaf Planning & Environmental, October 2022).* • *Implement all mitigation measures as proposed* • *Discuss construction timelines with landowners so that grazing of livestock can take place away from construction areas.* • *Collaborate with the necessary road management agencies when road closures are required and advertise alternative routes in advance.* • *Impose penalties for reckless drivers as a way to enforce compliance to traffic rules.*	
HEALTH AND SAFETY	Health and safety risks for workers and the broader	**DIRECT**	**MODERATE -**	• *Ensure implementation of the provisions of*	**LOW -**

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RISKS FOR WORKERS	community are possible to manifest. Community health and safety risks are associated with the inflow of workers. The Occupational Health and Safety Act (Act No. 85 of 1993) makes provision for the health and safety of workers at construction sites. These risks are broadly associated with: • Construction related accidents due to structural safety of Project infrastructure, possibly resulting in fatalities; • Dust generation and air pollution resulting in respiratory diseases; • High ambient noise levels caused by machinery and construction equipment, resulting in loss of hearing or other similar health issues; • Dehydration, sunburn and related issues for workers due to unsafe and insufficient drinking water and high temperatures during summer months; and • An increase in HIV/AIDS and other STDs due to prostitution activities and temporary sexual relationships with local women and unwanted pregnancies that place further pressure on Basic Health Care Services. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would not impact the SEIA ratings significantly.*	**CUMULATIVE** **NO-GO**	**MODERATE -**	*the Occupational Health and Safety Act (Act No. 85 of 1993) and adhere to the Emergency and Safety plan procedures for the duration of the construction phase.* • *Promote good conduct of employees through awareness campaigns. It is also recommended that the Developer embarks on a Social Awareness Campaign for the workforce that focuses on sexual health, unwanted pregnancies and related social issues.* • *Contractors to provide a housing plan that makes provision for workers that do not live nearby to return to their families at regular intervals or over weekends.* • *Provide safe and clean drinking water and instil regular water breaks to keep workers hydrated.* • *Provide sufficient ablution facilities (chemical/portable toilets, etc.) at strategic locations that are cleaned regularly.* • *Keep the local police, emergency and ambulance services informed of construction times and progress.*	**MODERATE -**
TERRESTRIAL BIODIVERSITY IMPACT ASSESSMENT					
POTENTIAL	Permanent or temporary loss of indigenous	**DIRECT**	**LOW -**	• *Blanket clearing of vegetation must be limited*	**LOW -**

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TERRESTRIAL BIODIVERSITY IMPACTS **VEGETATION**	vegetation cover because of site clearing. Site clearing before construction will result in the blanket clearing of vegetation within the affected footprint. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on vegetation.*	**CUMULATIVE** **NO-GO**	**LOW -**	*to the site. No clearing outside of required footprint required for construction to take place.* • *Topsoil must be striped and stockpiled separately during site preparation and replaced on completion where revegetation will take place.* • *Any site camps and laydown areas requiring clearing must be located within already disturbed areas as far as possible, or away from watercourses, alluvial areas and other sensitive features (rocky outcrops).*	**LOW -**
POTENTIAL TERRESTRIAL BIODIVERSITY IMPACTS **FLORA SPECIES**	Loss of flora species of special concern during pre-construction site clearing activities. Several special of concern are known from surrounding areas, which could be destroyed during site preparation. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on floral species.*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	• *A flora search and rescue is recommended before commencement.* • *Respective permits to be obtained beforehand.*	**LOW -** **LOW -**
POTENTIAL TERRESTRIAL BIODIVERSITY IMPACTS **ALIEN INVASIVE**	Susceptibility of post construction disturbed areas to invasion by exotic and alien invasive species and removal of exotic and alien invasive species during construction. Post construction disturbed areas having no vegetation cover are often susceptible to invasion by weedy and alien species, which can not	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	• *Alien trees and weeds must be removed from the site as per CARA/ NEMBA requirements.* • *A suitable weed and alien invasive plant management plan to be implemented in construction and operation phases.* • *After clearing and construction is completed,*	**LOW -** **LOW -**

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SPECIES	only become invasive but also prevent natural flora from becoming established. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on alien invasive species.*			*an appropriate cover crop may be required, should natural re-establishment of grasses not take place in a timely manner, such as along road verges. This will also minimise dust.*	
POTENTIAL TERRESTRIAL BIODIVERSITY IMPACTS **EROSION**	Susceptibility of some areas to erosion because of construction related disturbances. Removal of vegetation cover and soil disturbance may result in some areas being susceptible to soil erosion after completion of the activity. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on erosion.*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	⅄ *Suitable measures must be implemented in areas that are susceptible to erosion. Areas must be rehabilitated, and a suitable cover crop planted once construction is completed.* ⅄ *Topsoil must be stripped and stockpiled separately and replaced on completion.* ⅄ *If natural vegetation re-establishment does not occur, a suitable grass must be applied.*	**LOW -** **LOW -**
POTENTIAL TERRESTRIAL BIODIVERSITY IMPACTS **ECOLOGICAL**	Disturbances to ecological processes: Activity may result in disturbances to ecological processes such as fragmentation (road, etc). *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	⅄ *Blanket clearing of vegetation must be limited to the development footprint, and the area to be cleared must be demarcated before any clearing commences.*	**LOW -** **LOW -**

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PROCESSES	*construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on ecological processes.*				
POTENTIAL TERRESTRIAL BIODIVERSITY IMPACTS **AQUATIC AND RIPARIAN PROCESSES**	Aquatic and Riparian processes: Diversion and increased velocity of surface water flows – Changes to the hydrological regime and increased potential for erosion. Impact of changes to water quality. Loss of riparian vegetation / aquatic habitat. Loss of species of special concern. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on aquatic and riparian processes.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -**	• *Suitable structures to be constructed at watercourse crossings that do not alter flows.* • *Stormwater discharge into watercourses to be protected against erosion.*	**LOW -** **LOW -**
POTENTIAL TERRESTRIAL BIODIVERSITY IMPACTS **FAUNAL HABITAT**	Loss of Faunal Habitat: Activity may result in the loss of habitat for faunal species, which could result in disturbance and displacement of faunal species. *Cumulative impact, on a localised scale, would be XX should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	• *Blanket clearing of vegetation must be limited to the construction footprint required.* • *Rocky outcrop areas and Riverine Rabbit Habitat to be avoided as far as possible.* • *It is important that clearing activities are kept to the minimum and take place in a phased manner, where applicable. This allows any smaller animal species to move into safe areas and prevents wind and water erosion of the cleared areas.*	**LOW -** **LOW -**

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	standard. *No-go alternative would result in no impact on XX.*				
POTENTIAL TERRESTRIAL BIODIVERSITY IMPACTS **FAUNAL PROCESSES**	Impacts to faunal processes because of the activity such as erection of barriers to movement. *Cumulative impact, on a localised scale, would be XX should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on XX.*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	▲ *The habitats and microhabitats present on the project site are not unique and are widespread in the general area, hence the local impact associated with the footprint would be of low significance if mitigation measures are adhered to.* ▲ *Small mammals within the habitat on and around the affected area are generally mobile and likely to be transient to the area. They will most likely vacate the area once construction commences. As with all construction sites there is a latent risk that there will be some accidental mortalities. Specific measures are made to reduce this risk. The risk of species of special concern is low, and it is unlikely that there will be any impact to populations of such species because of the activity.* ▲ *Reptiles such as lizards are less mobile compared to mammals, and some mortalities could arise. It is recommended that a faunal search and rescue be conducted before construction commences, although experience has shown that there could still be some mortalities as these species are mobile and may thus move onto site once construction is underway. A retile handler should be on call for such circumstances.* ▲ *Should any amphibian migrations occur between wetland areas during construction, appropriate measures (including temporarily suspending works in the affected area) should*	**LOW -** **LOW -**

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				be implemented.	
POTENTIAL TERRESTRIAL BIODIVERSITY IMPACTS **FAUNAL SPECIES**	Loss of faunal SSC due to construction activities: Activities associated with bush clearing, killing of perceived dangerous fauna, may lead to increased mortalities among faunal species. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on faunal species.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -**	• *A pre-commencement faunal search and rescue is recommended.* • *Respective permits to be obtained beforehand.* • *No animals are to be harmed or killed during the course of operations.* • *Workers are NOT allowed to snare any faunal species.*	**LOW -** **LOW -**
POTENTIAL RISKS TO FAUNA SPECIES OF CONSERVATION CONCERN: **HABITAT LOSS, DEGRADATION AND FRAGMENTATION**	The development may fragment an already highly fragmented landscape which may create barriers to geneflow where subpopulations are disconnected and isolated. Roads and fences can affect the quality and quantity of available habitat, most notably through fragmentation, creating barriers to animal movement. Erosion from construction may degrade the habitat and direct loss of habitat will occur due to necessity of access roads. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on habitat*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -**	• *Minimising the project footprint by utilising existing roads and disturbed areas as much as technically possible.* • *Locate developments away from identified sensitive habitats, this includes no go zones and buffer zones for turbine pads, electrical substations and housing facilities as well as construction laydown areas.* • *Implementing adequate dust control and erosion control.* • *Careful planning of road layout to minimise the length of roads traversing through riverine habitats and rocky ridges that have been identified as Very high or high sensitivity which may create barriers and fragment habitats.* • *Establish wildlife passes, where artificial barriers are found; this particularly refers to*	**LOW -** **LOW -**

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	loss, degradation and fragmentation with regards to faunal species.			*physical barriers such as roads and fences.* • *Develop and implement a site-specific spill management plan.*	
POTENTIAL RISKS TO FAUNA SPECIES OF CONSERVATION CONCERN: **DISTURBANCE**	Disturbance will be primarily in the form of visual and noise effects as well as general human activities. Visual stimuli from movements of the turbine blades may cause a disturbance which may be far reaching due to the site being open and unobscured. Noise effect from construction and associated human activities during this phase is highly probable. This impact will reduce once the WEF is operational however there will be continued noise pollution from turbines from both the hub and the swish of the blades. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on disturbance of faunal species of conservation concern.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -**	• Implementing adequate noise reduction measures, including the use of insulation to reduce noise output from turbine hubs. • Temporal (curtailment) restrictions. Temporal restriction strategies can focus on altering turbine operation during times or weather conditions when wildlife is most active or where a negative impact has been found during the monitoring program. • Targeted operational timing by working with wind facility managers to target specific turbines under certain weather conditions where a negative impact has been identified. This may require changing the minimum windspeed at which turbines begin to turn and generate energy (cut-in speed) so that they idle during gentle wind and in so doing reduce noise during periods of low ambient noise. • Minimise development lighting in order to minimise light pollution, disturbance to animals at night; • Minimize noise disturbance during constructions where construction takes place within 1000 m of Very high and high sensitivity habitats. Restricting noise to daytime (9 am – 4 pm) periods when most fauna are less active.	**LOW -** **LOW -**
POTENTIAL RISKS TO FAUNA SPECIES OF	There is an increased collision risk from increased traffic levels at the site and in the general area. This	**DIRECT** **CUMULATIVE**	**MODERATE -** **MODERATE -**	• Careful planning of roads to minimise the length that traverses through riverine and	**LOW -** **LOW -**

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CONSERVATION CONCERN: **MORTALITY FROM ROAD COLLISION**	impact is likely to be of highest concern during construction but is also expected during the operational phase. Roads and roadsides may attract SCC such as Riverine Rabbits and Karoo Dwarf Tortoises due to verge edge enhancement of vegetation and roads may be used to facilitate movement, thus further increasing collision risks. Access roads that traverse riverine habitats require careful planning and monitoring to reduce risk of rabbit mortality. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on faunal species in relation to road collision mortality.*	**NO-GO**		rocky habitats that have been identified as Very high or high sensitivity. • Use existing roads as much as possible. • Roadkill monitoring program on both internal and external public roads targeting sensitive habitats and wildlife corridors. Roadkill Monitoring programs must be initiated at pre-construction phase and continued during construction and post-construction as well as conducted over different seasons. • Pre-construction road planning to identify target sites for wildlife crossing structures which should be considered during the EIA process and with pre-construction roadkill monitoring findings. Wildlife crossing structures must be made in consultation with road planner, construction manager and wildlife biologist. This is generally more cost effective than retro fixing existing roads. • Assess efficiency of roadkill mitigation approaches via a post-implementation roadkill monitoring program. • Implementation of speed limits on both internal access WEF roads (40km/h) as well as external public roads (60km/h). • Reduced speed limits of 30km/h where roads (both internal and external) cross High and Very high sensitivity areas identified; including riverine habitat, koppies and ecotones which may harbour sensitive species and generally have higher species diversity and abundance • Wildlife warning signage and speed reduction	

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				measures where roads cross High and Very high sensitivity areas. • Education and awareness campaigns on SCC and their habitat must form part of staff induction procedures to help increase awareness, respect and responsibility towards the environment for all staff and contractors. • Inductions on safe wildlife passing and driving to reduce possible injury and roadkill alongside roads. • There is higher risk of collision when animals are more active which is typically from late afternoon to early morning. During these times a low speed limit (30km/h) needs to be implemented. Night-time driving should be avoided as much as possible but if necessary, speed needs to be reduced significantly to avoid collisions. Lagomorph species (hares and rabbits) often freeze in headlights and require headlights to be momentarily turned off to allow the animal to move off the road. • Reduced speeds also need to be implemented during reduced visibility such as misty conditions that have been observed on the site. • Induction must include reporting of any vehicle/wildlife collision or found roadkill to the appointed Roadkill monitoring personnel. • Search and rescue of slow-moving species, specifically Karoo Dwarf Tortoises, during the construction phase. IUCN guidelines for translocation of sensitive species should be	

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				consulted. Tortoises will need to be carefully relocated and provided shelter and water-rich food as well as monitoring of threatened species to ensure of their survival. Should a subpopulation be found further consultations with a herpetologist will be required for appropriated mitigation.	
POTENTIAL RISKS TO FAUNA SPECIES OF CONSERVATION CONCERN: **CUMULATIVE IMPACT**	The cumulative impact is of concern, given the fact that the renewable-energy industry is rapidly expanding in South Africa. The local fauna is already impacted and threatened by past and current land use and the combination of these existing anthropogenic impacts with planned developments may impact the local fauna with unexpectedly large effects. Cumulative effects can also result where the construction phase occurs at several locations simultaneously or if a new project begins construction immediately following the completion of another. Cumulative effects can cause a small localized effect (which may have a limited effect on its own) to have a significant impact on population level as there may be thresholds where the cumulative effects increase disproportionally. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact from a cumulative faunal species of conservation concern*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -**	• *It is important to evaluate the consequences of each development before the next is begun.* • *Use a precautionary approach and aim to minimise negative effects even when the effects are not fully known.* • *Ensure the construction phase is done in as short a period as possible and avoid breeding season, typically in the spring after good rains.* • *Construction needs to be done during daytime, avoiding noise and disturbance when faunal communities are most likely active, particularly where the construction is in proximity to their habitat. Sensitive habitats near construction will need to be clearly marked.* • *Relating construction phase of the development with neighbouring developments and farming activity to ensure construction does not begin immediately after the completion of another or simultaneously.* • *The developer instigates a proactive mitigation measure by initiating a multi-stakeholder dialogue at a workshop to clarify these concerns and how they might be taken*	**LOW -** **LOW -**

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	loss perspective.			*forward and co-funded. The aim of this mitigation is to reduce current impacts that threaten the survival of SCC populations. We recommend a biodiversity wildlife corridor approach whereby protecting sensitive habitats is made a priority. This may include species refuge areas where no form of indiscriminate wildlife killing/snaring is allowed, no or highly reduced livestock grazing, and no pest control including locust spraying is carried out.* • *Poaching and the use of hunting dogs at site is prohibited.*	
POTENTIAL RISKS TO FAUNA SPECIES OF CONSERVATION CONCERN: **CASCADING IMPACT ACROSS TROPHIC LEVELS**	The effect of the wind farm on one species may have indirect cascading effects (knock on effect) on other species within the same community due to ecological relations to one another. This means that an effect on one species may in turn affect many others within the same ecosystem. Cascading effects may be complex and unpredictable as it may be the result of different types of interactions including competition, predation, parasitism, or symbiosis. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no cascading impact across the trophic levels due to the proposed WEF..*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -**	• *Initiate a general Fauna Biodiversity Monitoring program* • *A Fauna Biodiversity program must be initiated pre-construction to have baseline population status and monitoring must be ongoing post-construction to identify any changes in occupancy in certain species' population which may in turn indirectly impact other fauna populations.* • *We recommend the use of multiple monitoring methods including and not limited to; camera trapping in diverse habitats, targeted camera trapping for SCC; small mammal monitoring with the use of Sherman traps; the use of Conservation Scent Detection Dog teams to assist in detecting SCC.*	**LOW -** **LOW -**
VISUAL IMPACT ASSESSMENT					

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POTENTIAL VISUAL IMPACT OF CONSTRUCTION ON SENSITIVE VISUAL RECEPTORS IN CLOSE PROXIMITY TO THE FACILITY	During the construction period, there will be an increase in heavy vehicles utilising the roads to the construction sites that may cause, at the very least, a visual nuisance to other road users and landowners in the area in close proximity (within 5km). Within the region, dust as a result of construction activities may also be visible, as such it will result in a visual impact occurring during construction. This impact is likely to be of high significance before mitigation and moderate significance post mitigation on the identified sensitive visual receptors within this zone: ▪ Users of the various secondary roads ▪ Residents of the following homesteads: o Taaibosfontein o Erasmuskraal o Ramfontein The following homesteads are located on farm portions earmarked for the Victoria West WEF, thereby reducing the probability of this impact occurring on these specific receptors (i.e. it is assumed that these landowners are supportive of WEF developments and their associated visual impacts): ▪ Altona ▪ Spes Bona ▪ Lakenvlei ▪ Stampfontein ▪ Quaggasfontein *Cumulative impact, on a localised scale, would be high*	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **HIGH -**	⅄ *Ensure that vegetation is not unnecessarily removed during the construction period.* ⅄ *Reduce the construction period through careful logistical planning and productive implementation of resources.* ⅄ *Plan the placement of lay-down areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e., in already disturbed areas) wherever possible.* ⅄ *Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.* ⅄ *Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.* ⅄ *Reduce and control construction dust using approved dust suppression techniques as and when required (i.e., whenever dust becomes apparent).* ⅄ *Restrict construction activities to daylight hours whenever possible in order to reduce lighting impacts.* ⅄ *Rehabilitate all disturbed areas immediately after the completion of construction works.*	**MODERATE -** **MODERATE-**

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	should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would result in no visual impacts related to construction activities.*				
WAKE EFFECT STUDY					
None identified by specialist					
OPERATIONAL PHASE					
AGRICULTURAL IMPACT ASSESSMENT					
OCCUPATION OF LAND	Agricultural land directly occupied by the development infrastructure will become restricted for agricultural use, with consequent potential loss of agricultural productivity for the duration of the project lifetime. The small and widely distributed nature of the agricultural footprint of the facility means that only an insignificant proportion of the available agricultural land is impacted in this way. The potential cumulative agricultural impact of importance is a regional loss (including by degradation) of future agricultural production potential. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	*The allowable development limit on land of low and medium agricultural sensitivity with a land capability of < 8, as this site has been verified to be, is 2.5 ha per MW. This would allow the proposed facility of 270 MW to occupy an agricultural footprint of 675 hectares. The wind facility being assessed will occupy an agricultural footprint of < 81 hectares. It is therefore confirmed that the agricultural footprint of this development will be well within the allowable limit. It will in fact be approximately eight times smaller than what the development limits allow.*	**LOW -** **LOW -**

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	No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.				
SOIL EROSION AND DEGRADATION	Erosion can occur as a result of the alteration of the land surface run-off characteristics, predominantly through the establishment of hard surface areas including roads. Soil erosion is completely preventable. The storm water management that will be an inherent part of the road engineering on site and standard, best practice erosion control measures recommended and included in the EMPr, are likely to be effective in preventing soil erosion. Loss of topsoil can result from poor topsoil management during construction related excavations. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	• *Mitigation measures to prevent soil degradation are all inherent in the project design and / or are standard, best-practice for construction sites.* • *A system of storm water management, which will prevent erosion, will be an inherent part of the road engineering on site. Any occurrences of erosion must be attended to immediately and the integrity of the erosion control system at that point must be amended to prevent further erosion from occurring there.* • *Any excavations done during the construction phase, in areas that will be re-vegetated at the end of the construction phase, must separate the upper 30 cm of topsoil from the rest of the excavation spoils and store it in a separate stockpile. When the excavation is back-filled, the topsoil must be back-filled last, so that it is at the surface. Topsoil should only be stripped in areas that are excavated. Across the majority of the site, including construction lay down areas, it will be much more effective for rehabilitation, to retain the topsoil in place. If levelling requires significant cutting, topsoil should be temporarily stockpiled and then re-spread after cutting, so that there is a covering of topsoil over the entire surface.*	**LOW -** **LOW -**

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ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
INCREASED FINANCIAL SECURITY FOR FARMING OPERATIONS	Reliable and predictable income will be generated by the farming enterprises through the lease of the land to the energy facility. This is likely to increase their cash flow and financial security and could improve farming operations and productivity through increased investment into farming. *Cumulative impact, on a localised scale, would be LOW should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW +** **LOW +**		**LOW +** **LOW +**
IMPROVED SECURITY AGAINST STOCK THEFT AND OTHER CRIME	Improved security against stock theft and other crime due to the presence of security infrastructure and security personnel at the energy facility. *Cumulative impact, on a localised scale, would be LOW should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW +** **LOW +**		**LOW +** **LOW +**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
AQUATIC IMPACT ASSESSMENT					
PROACTIVE MONITORING TO ENSURE STRUCTURAL INTEGRITY IS MAINTAINED AND TO IDENTIFY EARLY SIGNS OF FAILURE / EROSION.	No direct impacts perceived. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters operational timelines overlap, which is likely. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to erosion of aquatic habitats.*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	• *No indiscriminate movement of construction equipment through the freshwater features may be permitted during standard operational activities or maintenance activities. Use must be made of the existing freshwater ecosystem crossings only;* • *Vehicles used in the development site must be regularly washed (on a non-permeable surface or off-site) to avoid the dispersal of seeds on any alien or invasive species into the freshwater features;*	**LOW -** **LOW -**
CONCENTRATED RUNOFF ENTERING THE FRESHWATER FEATURES **AND** **DISTURBANCE TO THE VEGETATION WITHIN AND SURROUNDING THE FRESHWATER FEATURES.**	Concentrated runoff from the road crossings leading to erosion and subsequent sedimentation of the freshwater features (increase in the sediment load) and turbulent flows when surface water is present; Higher flood peaks into the freshwater features due to reduced surface roughness in the freshwater features. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters operational timelines overlap, which is likely. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to disturbance of freshwater features.*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	• *Hot spots for the build-up of debris and excess sediment must be identified and when necessary, debris/excess sediment must be removed by hand to prevent future flooding and potential damage to infrastructure;* • *Routine maintenance of the roads must be undertaken to ensure that no concentration of flow and subsequent erosion occurs due to the road crossings/instream infrastructure. Such maintenance activities must specifically be undertaken after high rainfall events;* • *Stormwater runoff from the road crossings must be monitored (by the O&M Manager, to ensure it does not result in erosion of the freshwater features. Stormwater must be allowed to diffusely spread across the landscape, by ensuring adequate surface roughness in the freshwater feature (through vegetation and rocky areas);* • *Maintenance vehicles must make use of dedicated access roads and no indiscriminate*	**LOW -** **LOW -**

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				movement in the freshwater features may be permitted; • *During periodic maintenance activities of the roads, monitoring for erosion must be undertaken; and* • *Should erosion be observed, caused by the road crossings/instream infrastructure, the area must be rehabilitated by infilling the erosion gully and revegetation thereof with suitable indigenous vegetation. Use can also be made of rocks collected from the surrounding area to infill any area prone to erosion (however, these must be sustainably sourced not taken from the surrounding freshwater features including rivers in the local area).*	
AVIFAUNAL IMPACT ASSESSMENT					
DISPLACEMENT THROUGH DISTURBANCE	The indications from operational wind farms are that this impact may be of fairly low importance, although it is acknowledged that a longer term or more	**DIRECT**	**LOW -**	• *All human activities associated with construction, operation and decommissioning should be strictly managed according to*	**LOW -**
		CUMULATIVE	**LOW -**		**LOW -**
		NO-GO			

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	detailed means of measuring this impact may be required. The impact of human-induced disturbance during the operational phase of the development is likely to be less severe than during the construction phase. Birds may be displaced from using the landscape for breeding, foraging and commuting purposes due to the loss of habitat, increased noise pollution and human presence. This may reduce population size or force individuals into suboptimal habitat. For the proposed project we consider this impact to be of Low Negative significance. *Cumulative impact, on a localised scale, would be LOW should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to disturbance of avifaunal habitats.*			*generally accepted environmental best practice standards, so as to avoid any unnecessary impact on the receiving environment.* • *A post-construction inspection must be conducted by an avifaunal specialist to confirm that all aspects have been appropriately handled and in particular that road and hard stand verges do not provide additional substrate for raptor prey species. It is essential that the new wind farm does not create favourable conditions for such mammals in high risk areas. We therefore recom-mend that within the first year of operations a full assessment of this aspect be made by the ornithologist contracted for post-construction monitoring. If such conditions have been created, case-specific solutions will need to be developed and implemented by the wind farm. It is strongly recommended that rodenticides not be used at the newly established Operation and Maintenance (O&M) buildings or around auxiliary infrastructure on the project site. While pest control of this nature may be effective, even so-called "environmentally friendly" rodenticides are toxic and pose significant secondary poisoning risk to predatory avifauna, especially owls.* • *Should more than one power line be constructed in parallel with another either new or pre-existing power line, the pylon structures should be staggered as per Pallett*	
DISPLACEMENT THROUGH HABITAT LOSS	As for disturbance above, the indications from operational wind farms are that this impact may be of fairly low importance, although it is acknowledged that a longer term or more detailed means of measuring this impact may be required. Birds may be displaced from using the landscape for breeding, foraging and commuting purposes due to the loss of habitat, increased noise pollution and human presence. This may reduce population size or force individuals into suboptimal habitat.	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**		**LOW -** **MODERATE -**

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	Cumulative impact, on a localised scale, would be LOW should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would result in no impact related to disturbance of avifaunal habitats.*			*et al. (2022) to increase visibility to large, slow-moving species, especially bustards and cranes.*	
MORTALITY FROM COLLISIONS WITH TURBINES	Turbine collisions have been discussed in depth in the literature section of this report. They represent the greatest risk to avifauna at this development. Turbine blades are not always visible to birds flying at rotor swept height and evasive action is not always possible. Striking a moving blade almost certainly results in death or serious injury. In the case of resident species, or those that occupy home ranges on a fairly permanent basis, fatalities represent the loss of individuals in the greater study area, both directly (due to fatalities themselves) as well as indirectly (due to the loss of breeding potential, particularly between monogamous pairs). Human caused fatalities of regionally Red Listed or otherwise threatened bird species are always cause for concern and should be avoided as far as possible. The estimated fatalities we have predicted are therefore of some concern for the relevant species, in particular Verreaux's Eagle, Ludwig's Bustard, Martial Eagle, Black Harrier and Jackal Buzzard. There are currently no established thresholds for acceptable impacts on bird species in South Africa. To establish these thresholds would require complex modelling	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -**	• *All human activities associated with construction, operation and decommissioning should be strictly managed according to generally accepted environmental best practice standards, so as to avoid any unnecessary impact on the receiving environment.* • *A post-construction inspection must be conducted by an avifaunal specialist to confirm that all aspects have been appropriately handled and in particular that road and hard stand verges do not provide additional substrate for raptor prey species. It is essential that the new wind farm does not create favourable conditions for such mammals in high risk areas. We therefore recom-mend that within the first year of operations a full assessment of this aspect be made by the ornithologist contracted for post-construction monitoring. If such conditions have been created, case-specific solutions will need to be developed and implemented by the wind farm. It is strongly recommended that*	**MODERATE -** **MODERATE -**

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	incorporating accurate information on many factors for each species (including population size, age-specific fatality rates, breeding productivity, etc). Such modelling and information are not available in South Africa at present. In the absence of this information, we are forced to make a somewhat subjective decision as to the acceptability of the estimated annual fatalities. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to disturbance of avifaunal habitats.*			*rodenticides not be used at the newly established Operation and Maintenance (O&M) buildings or around auxiliary infrastructure on the project site. While pest control of this nature may be effective, even so-called "environmentally friendly" rodenticides are toxic and pose significant secondary poisoning risk to predatory avifauna, especially owls.* • *An observer-led turbine Shutdown on Demand (SDOD) programme must be implemented on site from COD. This programme must consist of a suitably qualified, trained and resourced team of observers present on site for all daylight hours 365 days of the year. This team must be stationed at vantage points with full visible coverage of all turbine locations. The observers must detect incoming priority bird species, track their flights, judge when they enter a turbine proximity threshold, and alert the control room to shut down the relevant*	
FATAL TURBINE COLLSIONS: MIGRATORY SPECIES (BLACK HARRIER)	Turbine collisions have been discussed in depth in the literature section of this report. They represent the greatest risk to avifauna at this development. The impact for Black Harrier is of greater consequence	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -**		**MODERATE -** **MODERATE -**

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	and wider significance: this migratory species is near endemic to South Africa (more than 70% of the population occurs within the country), and loss of any individuals of this Endangered species thus jeopardise the global population. The "Probability" of this impact is rated as "May Occur", which is to say that with an already highly threatened population of only ~1 000 individuals, the likelihood of collision with turbines on this specific site is not particularly high. However, the implications of even a single fatality are far-reaching, long-lasting and cumulative. In the case of migratory species, we conclude that the impact of bird collision with turbines is of Moderate Negative significance. There are various mitigation measures described in Section 7 and these will reduce the significance somewhat. The degree of this reduction is however uncertain, as the mitigation measures are largely unproven in these conditions. At this stage, we judge that the significance post-mitigation will be of Moderate Negative significance. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to disturbance of avifaunal habitats.*			*turbine until the risk has reduced. A full detailed method statement or protocol must be designed by an ornithologist prior to COD, and included as an annexure of the EMP.* • *The combination of hub height and rotor diameter must be optimised to maximise the lower blade tip height above ground. Raising the lower turbine blade tip height from a typical 30m above ground to 80m above ground will reduce collision risk for cranes, Ludwig's Bustards, Black Harrier and korhaans, which typically fly low over the ground. Raising the lower blade tip from 30 to 80m above ground as a mitigation measure benefited every target species (in terms of reduced predicted mortality). Low sample size in this study was a limitation although it has been predicted to significantly reduce fatality rates on similar projects and we recommend the implementation of this measure.* • *All turbine blades must be painted according to a protocol currently under development by the South African Wind Energy Association (SAWEA) from the outset. Provision must be made by the developer for the resolution of any technical, warranty, supplier challenges that this may present.* • *Any residual impacts after all possible mitigation measures have been implemented will need to be mitigated off site. The facility will need to address other sources of mortality of priority species in a measurable way so as to compensate for residual effects on the*	

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				facility itself. This will need to be detailed in a Biodiversity Action Plan. • *Should more than one power line be constructed in parallel with another either new or pre-existing power line, the pylon structures should be staggered as per Pallett et al. (2022) to increase visibility to large, slow-moving species, especially bustards and cranes.*	
MORTALITY FROM POWERLINE COLLISIONS	Collision with power line infrastructure has been discussed in depth in the literature section of this report. Unmitigated, it represents a moderately high risk to avifauna at this development, particularly to bustards, storks, cranes and flamingos (collision). Large-bodied birds often lack the manoeuvrability to avoid poorly-marked power lines in flight when commuting in the landscape. This impact is relatively easily mitigated, however, our understanding from recent literature is that mitigation such as power line pylon staggering is not 100% effective and partial losses may still occur *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same*	**DIRECT** **CUMULATIVE**	**MODERATE -** **MODERATE -**	• *The constraint areas identified by this study (which build on those identified in the screening phase) should be adhered to.* • *Any residual impacts after all possible mitigation measures have been implemented will need to be mitigated off site. The facility will need to address other sources of mortality of priority species in a measurable way so as to compensate for residual effects on the facility itself. This will need to be detailed in a Biodiversity Action Plan.* • *The pole design of any overhead power line should be approved by an ornithologist in terms of the electrocution risk it may pose to large birds such as eagles.* • *Should more than one power line be constructed in parallel with another either new or pre-existing power line, the pylon*	**MODERATE -** **MODERATE -**

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	developer and the EMPrs will be prepared to the same standard. *No-go alternative would result in no impact related to disturbance of avifaunal habitats.*			*structures should be staggered as per Pallett et al. (2022) to increase visibility to large, slow-moving species, especially bustards and cranes.*	
MORTALITY FROM POWERLINE ELECTROCUTIONS	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. This is particularly true for raptors with larger wingspans such as Verreaux's and Martial Eagles. In a treeless landscape such as the proposed site the risk is exaggerated as the birds will certainly perch on pylons if available and may also nest on them. Once correctly installed, such infrastructure should not pose any danger to perching birds and no fatalities will occur *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to disturbance of avifaunal habitats.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -**	• *The constraint areas identified by this study (which build on those identified in the screening phase) should be adhered to.* • *Any residual impacts after all possible mitigation measures have been implemented will need to be mitigated off site. The facility will need to address other sources of mortality of priority species in a measurable way so as to compensate for residual effects on the facility itself. This will need to be detailed in a Biodiversity Action Plan.* • *The pole design of any overhead power line should be approved by an ornithologist in terms of the electrocution risk it may pose to large birds such as eagles.* • *Should more than one power line be constructed in parallel with another either new or pre-existing power line, the pylon structures should be staggered as per Pallett et al. (2022) to increase visibility to large, slow-moving species, especially bustards and cranes.*	**LOW -** **LOW -**
BAT IMPACT ASSESSMENT					
BAT FATALITY	Bat mortality (direct impact) through collisions with wind turbine blades is the principal impact of wind energy facilities on bats (Cryan and Barclay 2009, Arnett et al. 2016).	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **HIGH -**	***Avoid:*** • *No placement of turbines within no-go areas.* ***Minimise:*** • *Maintain a minimum blade sweep of 30 m to*	**MODERATE -** **MODERATE -**

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	Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters operational timelines overlap, which is likely. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would result in no impact related to bats.*			*avoid impacts to lower flying bats such as clutter-edge species (e.g., Cape serotine, Natal long-fingered bat)* • *Minimise the rotor diameter* • *Turbine blades must be feathered, or a similar technique should be used, to prevent free-wheeling below the turbine cut-in speed.* • *Implement post-construction fatality monitoring and apply additional curtailment or deterrents if fatality thresholds are exceeded.*	
LIGHT POLLUTION	Construction of infrastructure will increase ecological light pollution from artificial lighting associated with the substation and other operational and maintenance buildings associated with the project. Light pollution can alter ecological dynamics (Horváth et al. 2009). Lighting attracts and can cause direct mortality of insects, reducing the prey base for bats, especially bat species that are light-phobic. These species may also be displaced from previous foraging areas due to lighting. Other bat species forage around lights, attracted by higher numbers of insects. This may bring these species into the vicinity of the project and indirectly increase the risk of collision with wind turbines. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters operational timelines overlap, which is likely. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.*	**DIRECT AND INDIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **HIGH -**	**Avoid:** No placement of substations and operational and maintenance buildings within no-go areas. **Minimise:** • Use as little lighting as possible, maximise use of motion-sensor lighting, avoid sky-glow by using hoods, increase spacing between lighting units, and using low intensity lighting (Rydell 1992, Stone 2012).	**LOW -** **MODERATE -**

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	No-go alternative would result in no impact related to bats.				
HERITAGE IMPACT ASSESSMENT					
LOSS OF HERITAGE RESOURCES: STONE AGE OCCURANCES	impact on previously undetected archaeological sites, human burials and the cultural landscape might occur as a result of operational activities (site access, movement, maintenance, trespassing, natural elements, hazards etc). *Cummulative impact:* *The low frequency of significant archaeological resources documented in the project area and in its immediate surroundings implies low-severity short and long-term impacts on the heritage landscape* *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to destruction of archaeological resources.*	**DIRECT**	**LOW -**	It is understood that no new areas will be disturbed and/or impacted during the operations phase of the project and the risk and severity of heritage impacts should decrease once the projects activate. Furthermore, the majority of sites of archaeological and heritage significance would have been recorded and/or assessed in preceding phases. *Cumulative impact:* • *The significance of the landscape in terms of its heritage is bound not to change during the course of construction, operation and decommissioning of the project.* • *It should be noted that archaeological knowledge and the initiation of research projects into significant archaeological sites often result from Heritage Impact Assessments conducted for developments. Provided that significant archaeological sites are conserved and that appropriate heritage mitigation and management procedures are followed, the cumulative impact of development can be positive.*	**LOW -**
		CUMULATIVE	**LOW -**		**LOW – AND LOW (+)**
		NO-GO			

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LOSS OF HERITAGE RESOURCES: ROCKSHELTER (SRc02) AND CORBEL BUILDING (SRC01)	impact on previously undetected archaeological sites, human burials and the cultural landscape might occur as a result of operational activities (site access, movement, maintenance, trespassing, natural elements, hazards etc). *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to destruction of archaeological resources.*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	It is understood that no new areas will be disturbed and/or impacted during the operations phase of the project and the risk and severity of heritage impacts should decrease once the projects activate. Furthermore, the majority of sites of archaeological and heritage significance would have been recorded and/or assessed in preceding phases. During the Operations Phase, the continuation of management measures for the rock shelter (SRC02) and a corbel building (SRC01) -should the sites be retained -should be tracked and continuous ECO site monitoring will be required.	**LOW -** **LOW – AND LOW (+)**
NOISE IMPACT ASSESSMENT					
DAYTIME OPERATION OF WTG CONSIDERING THE WORST-CASE SPL	WTG will only operate during period with increased winds, when ambient sound levels are higher than periods with no or low winds. As discussed and motivated in Section 6.4 of the Noise Impact Assessment (as proposed in Table 6-2 and illustrated in Figure 4-28), ambient sound levels will likely be higher, with this assessment assuming an ambient sound level of 41.5 dBA. Numerous WTG of the Taaibos South WEF operating simultaneously during the day will increase ambient sound levels due to air-borne noise from the WTG. The projected noise levels and the change in ambient sound levels is defined for the identified NSR in Appendix F, Table 4 of the Noise Impact Assessment.	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	*The significance of the noise impact is low and no additional mitigation is recommended.*	**LOW -** **LOW -**

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	Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters operational timelines overlap, which is likely. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would result in no impact related to daytime operational noise.*				
NIGHT-TIME OPERATION OF WTG CONSIDERING THE WORST-CASE SPL	WTG will only operate during period with increased winds, when ambient sound levels are higher than periods with no or low winds. As discussed and motivated in Section 6.4 of the Noise Impact Assessment (as proposed in Table 6-2 and illustrated in Figure 4-29), ambient sound levels will likely be higher with this assessment assuming an ambient sound level of 41.5 dBA. Numerous WTG of the Taaibos South WEF operating simultaneously at night will increase ambient sound levels due to air-borne noise from the WTG. The projected noise levels, the change in ambient sound levels as well as the potential noise impact is defined per NSR in Appendix F, Table 5 (using the criteria of the author/EARES) of the Noise Impact Assessment. It is expected that the sounds from the operating WTG may be audible at night. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters operational timelines overlap, which is likely. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	▲ *The significance of the noise impact is low and no additional mitigation is recommended, though future noise-monitoring is recommended.*	**LOW -** **LOW -**

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	same developer and the EMPrs will be prepared to the same standard. *No-go alternative would result in no impact related to night-time operational noise.*				
PALAENTOLOGICAL IMPACT ASSESSMENT					
None identified by specialist					
RIVERINE RABBIT IMPACT ASSESSMENT					
DISTURBANCE THROUGH NOISE POLLUTION	Disturbance will be primarily in the form of visual and noise effects as well as general human activities. Visual stimuli from movements of the turbine blades may cause a disturbance, this may be far reaching due to the site being open and unobscured. This impact will reduce once the WEF is operational however there will be continued noise pollution from turbines sound from both the hub as well as from the swish of the blades. Riverine Rabbits rely on hearing for predator detection and avoidance and so may be more susceptible to noise due to impaired hearing and masking effect. We do not know the effect of turbine noise on Riverine Rabbits, they may choose to avoid an area and relocate, it may also alter their activity pattern or cause behavioural abnormalities due to adverse effects on their nervous system where displacement is not observed. Wind turbine noise varies with design and size and noise reduction is continuously improving with new turbine design, however it is very likely that the Riverine rabbit hearing frequency range overlaps with the frequency range of wind turbine noise. Habitat specialist species, such as riverine rabbits, may be limited in their ability to relocate should they be disturbed. Consequently, the difficulty in providing definitive levels of the point at which noise will have an impact	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **HIGH -**	• Precautionary buffers of 700m for identified very high sensitivity areas, whilst taking into consideration topographical variations at the site; i.e. turbines that are obstructed by a hill may be placed closer to riverine habitats as visual and noise impact would be buffered by the topography of the land. • Precautionary buffers of 350m for secondary drainage lines that consist mostly of poor degraded riverine habitat and identified as either Medium or Low sensitivity. • Implementing adequate noise reduction measures, including the use of insulation to reduce noise output from turbine hubs. • Temporal (curtailment) restrictions. Temporal restriction strategies can focus on altering turbine operation during times or weather conditions when wildlife is most active or where a negative impact has been found during the monitoring program. • Changing the minimum windspeed at which turbines begin to turn and generate energy (cut-in speed), so that they idle during gentle wind, reduces noise during periods of low ambient noise.	**LOW -** **LOW -**

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	necessitates a conservative approach to buffering preferred riverine rabbit habitat. The potential riverine rabbit habitat on the plateau has been buffered by a minimum of 350m and higher potential habitat, including where the presence of rabbits has been confirmed, has been buffered by 700m, which would reduce the potential significance of this impact. Given the distance between the turbines and High sensitivity zones, it is assumed, with a low level of certainty, that this impact would be of generally low magnitude. *Cumulative impact, on a localised scale, would be HIGH should the Taaibos and Soutrivier WEF clusters operational timelines overlap, which is likely. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on the local Riverine Rabbit population.*			• Targeted operational timing by working with wind facility managers to target specific turbines under certain weather conditions where a negative impact has been identified. • Measure sound pressure levels at the WEF site, taking measurements at ~0.25m from the ground with two sets of measurements taken; one when turbines are active and one when inactive and at different distances from turbines including within Riverine rabbit habitat. • Minimize noise disturbance during construction. Restrict noise to daytime (9am – 5pm) periods when rabbits are less active.	
DEGRADATION OF HABITAT BY EROSION	The construction of roads, turbine hard-stands, roads and laydown areas etc. will result in the destruction of currently intact vegetation, which may lead indirectly to soils being exposed and facilitating erosion. Erosion leads to river degradation through increased runoff and siltation processes. If erosion control is implemented, the resulting impact from erosion and would also be low. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters operational timelines overlap, which is likely.*	**DIRECT AND INDIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -**	• *Implement a Site Erosion Management and Control Plan to prevent erosion from high-lying areas impacting downstream ecosystems*	**LOW -** **LOW -**

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	However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would result in no impact on the local Riverine Rabbit population.*				
MORTALITY BY COLLISION	There is an increased collision risk from expected increased traffic levels at the site. This impact is likely to be of highest concern during construction but is expected to continue during operational phase. Roads and roadsides may attract riverine rabbits due to edge enhancement of vegetation on verges and the potential facilitation of movement, thus further increasing collision risks. Access roads that traverse riverine habitats require careful planning and monitoring to reduce risk of rabbit mortality. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters operational timelines overlap, which is likely. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on the local Riverine Rabbit population.*	**DIRECT AND INDIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **HIGH -**	• *Careful planning of roads to minimise the length that traverses riverine habitats that have been identified as Very high or high sensitivity.* • *Use existing roads as much as possible.* • *Roadkill monitoring program on both internal and external public roads targeting sensitive habitats and wildlife corridors. Roadkill Monitoring programs must be initiated at pre-construction phase and continued during construction and post-construction as well as conducted over different seasons.* • *Pre-construction road planning to identify target sites for wildlife crossing structures which should be considered during the EIA process in conjunction with pre-construction roadkill monitoring findings. Wildlife crossing structures must be made in consultation with road planner, construction manager and wildlife biologist. This is generally more cost effective than retro fixing existing roads.* • *Assess efficiency of roadkill mitigation approaches via a post-implementation roadkill monitoring program.* • *Implementation of speed limits on both internal access WEF roads (40km/h) as well as external public roads (60km/h).*	**LOW -** **LOW -**

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				• *Reduced speed limits of 40km/h where roads (both internal and external) cross High and Very high sensitivity areas identified.* • *Wildlife warning signage and speed reduction measures where roads cross High and Very high sensitivity areas.* • *Education and awareness campaigns on riverine rabbits and their habitat must form part of staff induction procedures to help increase awareness, respect and responsibility towards the environment for all staff and contractors.* • *Any contractor employed for development work must ensure that no rabbit or hare species are disturbed, trapped, hunted or killed by them and their team during the construction phase. Conservation-orientated clauses should be built into contracts for construction personnel, complete with penalty clauses for non-compliance.* • *Inductions on safe wildlife passing and driving to reduce possible injury and roadkill alongside roads.* • *There is higher risk of collision when riverine rabbits are active which is typically from late afternoon to early morning. Traffic should be reduced during the early hours of the morning (04:00 – 09:00) and early evening (18:00 – 22:00). During these times a low speed limit (40km/h) needs to be implemented.* • *Night-time driving should be avoided as much as possible but if necessary, speed needs to be reduced significantly (<40km/h) to avoid*	

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				collisions. Lagomorph species (hares and rabbits) often freeze in headlights and require headlights to be momentarily turned off to allow the animal to move off the road. • *Reduced speeds also need to be implemented during reduced visibility such as misty conditions that have been observed on the site.* • *Induction must include reporting of any vehicle/wildlife collision or found roadkill to the appointed Roadkill monitoring personnel.*	
SOCIO-ECONOMIC IMPACT ASSESSMENT					
NEW EMPLOYMENT AND ECONOMIC IMPACTS	Direct and indirect employment opportunities will manifest during the operational lifespan of the Project and result in an increase in household earnings and improved livelihoods for the affected households through salaries and wages. • *WEF Projects of this nature employ between ten to fifteen permanent workers, of which about 50% would be skilled (Operations Manager, technicians, electricians, engineers, mechanics, Health & Safety Officer, etc.) and 50% semi-skilled (security, site maintenance, etc.).* • *Temporary workers would be sourced through service providers to perform contract maintenance work such as civil works, site maintenance, site clearing to minimise the potential of veld fires, painting of buildings, plumbing and so forth.* • *Job creation as a result of the funding spent on SED projects, such as construction / infrastructure projects, literacy / education programmes, sport development, etc.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE +** **MODERATE +**	• *Maximise local employment and procurement (from the local and district municipalities) wherever possible.* • *Coordinate the effort to obtain temporary employment, service providers, SMME's etc. required for maintenance work, with the municipal LED Units.*	**MODERATE +** **MODERATE +**

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	➢ *Indirect and induced employment created through procurement of components, equipment, goods and services to maintain the infrastructure and access roads.* In additional to employment, economic impacts will manifest for the local and national economies through the manufacturing and services industries. Furthermore, agricultural land will be rezoned for renewable energy purposes, thereby increasing farm values and resulting in higher payable taxes for the local municipality. Induced economic impacts will realise locally and regionally through employment and procurement and as a result more benefits for retail sales, leisure and hospitality, real estate, etc. will occur as more money circulates in the local economy. *Cumulative impact, on a localised scale, would be MODERATE should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would not impact the SEIA ratings significantly*				
INCREASE IN LIVELIHOODS FOR DIRECTLY BENEFITTING LANDOWNERS	During the operational period the IPP will sign a long-term lease agreement with the affected landowners where turbines (up to 32) and associate infrastructure are located, thereby compensating them through an annual fee. Details of the option-to-lease agreements are confidential. However, the compensation will increase the landowners' incomes and revenue and	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE +** **MODERATE +**	➢ Consider the potential increase in rates and taxes when lease agreements are negotiated with landowners.	**MODERATE +** **MODERATE +**

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	can be used to further invest in their properties, increase productivity and employment, or improve financial security. It is however also worth noting that the rezoning of agricultural land for renewable energy infrastructure purposes usually results in higher payable property taxes, which, if not considered during the negotiation process, could result in a negative trade-off for landowners. *Cumulative impact, on a localised scale, would be MODERATE should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on XX.*				
SOCIO-ECONOMIC CONTRIBUTION / COMMUNITY DEVELOPMENT	A needs assessment will be done with the affected parties (municipalities, beneficiary communities, etc.) to identify suitable projects for SED and ED, which is usually aligned with IDP and LED priorities. Once the identified beneficiaries have been evaluated according to stringent evaluation criteria a contract is entered with them for the specified duration of the projects. Monitoring is done to ensure that the projects deliver as per their proposals. The IPP is required to report quarterly to the DMRE's Independent Power Producer Office (IPPO), which allows the IPPO to monitor use of SED and ED funds as committed by the Project (approximately 2.1% of revenue), as well as monitor the impact such contributions have on the communities through	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW +** **LOW +**	▲ Involve the local and district municipalities' LED Units in all processes when SED and ED projects and suitable candidates for projects and/or training programmes are identified. ▲ Make gender and Youth issues a specific outcome of the needs analysis to ensure that these groups are targeted. ▲ In conjunction with other IPP's in the region or in the RE corridor / RE Zone set up and establish a Forum (or similar structure) to coordinate community development initiatives. Meet on a quarterly basis to provide feedback and ensure transparency. ▲ Ensure further transparency and effective information sharing through industry	**MODERATE +** **MODERATE +**

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	funding of existing projects and enterprises. Consultation with municipal stakeholders for this Project and for previous RE projects in other provinces identified the need for: More transparency during the annual monitoring processes so that it is clear for municipalities whether the budget allocated towards SED and ED has been used adequately; • A greater commitment to link with the LED initiatives already identified in the IDP; • Coordination between SED and ED initiatives of the various RE projects in the region through a central Forum or similar structure so that initiatives are not duplicated. This will also enable the implementation of larger projects that will have a greater impact for the region. *Cumulative impact, on a localised scale, would be MODERATE should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would not impact the SEIA ratings significantly.*			associated websites, emailed newsletters, municipal noticeboards, information events and meetings and existing community channels used by the various wards. • Become involved in local initiatives that address existing backlogs, such as the establishment and training of an Emergency Unit / Response Team for fire prevention and emergencies (e.g. with volunteers such as farmers), hospital support (e.g. equipment, training of staff where there are staff shortages, etc.) and so forth to ensure that real community based needs are met. • Link with existing NGO's and pre-established projects but make it a requirement (and set targets) for the establishment of new community-driven development processes and for NGO's to assist in skills transfer to these new groups and processes.	
TRAINING / SKILLS DEVELOPMENT / CAPACITY BUILDING	Training and skills development initiatives during operations are likely to occur in the following ways: Formal and on-the-job training for permanent and temporary employees to allow them to perform their tasks safely and adequately; • Training / education programmes through ED contributions;	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW +** **LOW +**	• Identify existing NGO's to assist in training and skills transfer to communities and Officials. • Link with existing training workshops and programmes for SMME development that are done by municipal LED Units. • In collaboration with other IPPs operational in	**MODERATE +** **MODERATE +**

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	▲ Offering of bursaries and internships; ▲ Skills development and capacity building of municipal Officials during the negotiation processes and stakeholder relations. ▲ The implementation and operation of RE projects require local government involvement to assist with managing stakeholder and community relations. This poses various challenges, as there might be shortfalls in terms of capacity and management experience within the municipalities. Emphasis is therefore again placed on the involvement of local government throughout operations to enable the Officials to gain experience and develop skills that will be to the advantage of the Project as well as for the municipalities over the long-term. *Cumulative impact, on a localised scale, would be LOW should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would not impact the SEIA ratings significantly.*			the region, establish a SMME "Village" and training centre to coordinate training efforts of SMMEs and individuals. Link with bigger institutions such as Universities and Further Education and Training (FET) institutes to increase the impact of training and skills development in the region.	
LAND USE IMPACTS	The total footprint of the turbines and ancillary infrastructure is 76.68 ha post-construction. With a grazing capacity of 26 to 28 hectares per LSU, the loss in land amounts to a loss of only about 2.7 LSU. No high potential agricultural or cultivated land will be lost.	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	▲ *None suggested*	**LOW -** **LOW -**

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	Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would not impact the SEIA ratings significantly.*				
IMPACTS ON LAND VALUES	Incomes earned through long-term lease agreements will have an economic benefit and could increase farmland values and returns for the duration of operations. However, impacts on farmland values remain an inconclusive topic, since emotional factors and negative perceptions associated with the wind farm facility (such as aesthetics, visual impacts, noise, sense of place and so forth) could affect individual prospective buyers' interests and possibly prolong sales periods, which could be to the detriment of land values. In addition to negative perceptions, other variables such as the impact on land uses, location, proximity of wind turbines and lease agreement terms can have a significant impact on the marketability of rural land holdings (Peardon, 2013). It is thus the opinion of the SEIA Specialist that negative impacts on land values during the operational phase of the Taaibos South WEF are unlikely, but that individual negative perceptions towards the infrastructure could affect property sales negatively in terms of possible prolonged sale periods	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	• *None suggested*	**LOW -** **LOW -**

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	and fewer buyers' interests. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would not impact the SEIA ratings significantly.*				
IMPACTS ON TOURISM	Should impacts on tourism as a result of this project manifest, it will likely be due to visual impacts and impacts on sense of place. At this stage tourism in the PKSDM district contributes 15.6% to the provincial GVA, of which the Ubuntu LM is only a small contributor. Only one accommodation / tourism establishments has been identified in the study area, i.e. Meltonwold, a historical Karoo Guest Farm located about 8 km north of the nearest wind turbine. The VIA (Nuleaf, October 2022) determined that the potential visual impact on sensitive receptors within the local area (5 – 10 km offset) is likely to be of high significance. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would not impact the SEIA ratings*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	▲ Should the affected tourism establishment raise complaints and/or concerns, consult with them and consider to remove the turbine/s that they perceive could be problematic.	**LOW -** **LOW -**

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	significantly.				
IMPACTS ON SENSE OF PLACE	The Project is located in an area with low crime levels and has an overall feeling of solitude and stillness. The social impact associated with the long-term impact on the sense of place for this WEF project would thus relate to a potential change in the landscape character, intrusion impacts and any changes to the safety and social surroundings of community members. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would not impact the SEIA ratings significantly.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -**	• Implement an effective Land Use Management programme in collaboration with the landowners. • Implement all mitigation and management measures as proposed • Rehabilitate the veld to its original state post the operational phase.	**MODERATE -** **MODERATE -**
INTRUSION IMPACTS	The NIA (de Jager, October 2022) rated both daytime and night-time operational activities (noises form wind turbines) when considering the worst-case scenario with a low negative significance. The VIA (Nuleaf Planning & Environmental, October 2022) rated the visual impact on visual receptors in close proximity (within 5km) with a very high negative significance and those located between 5 and 20 km ranging from between high and moderate negative significance. The visual impact of shadow flicker is rated with a moderate significance. Traffic on local access roads will not increase significantly as maintenance and repairs to infrastructure will be done intermittently.	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -**	• Implement an effective Land Use Management programme (procedures when gates are opened and closed, road maintenance, methods to address potential veld fires, no-go areas, etc.) in collaboration with the landowners. • Implement all mitigation and management measures as proposed in the VIA and NIA Specialist reports.	**MODERATE -** **MODERATE -**

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	Cumulative impact, on a localised scale, would be XX should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would not impact the SEIA ratings significantly.*				
CONTRIBUTION TO NATIONAL POWER SUPPLY	The proposed Taaibos South WEF will generate electricity and enhance the reliability and stability of supply that would contribute to economic development in the country as a whole. *Cumulative impact, on a localised scale, would be MODERATE should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would not impact the SEIA ratings significantly.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE +** **MODERATE +**	• None suggested.	**MODERATE +** **MODERATE +**
TERRESTRIAL BIODIVERSITY IMPACT ASSESSMENT					
POTENTIAL TERRESTRIAL BIODIVERSITY IMPACTS **VEGETATION**	Permanent or temporary loss of indigenous vegetation cover because of site clearing. Site clearing before construction will result in the blanket clearing of vegetation within the affected footprint. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	• *Blanket clearing of vegetation must be limited to the site. No clearing outside of required footprint required for construction to take place.* • *Topsoil must be striped and stockpiled separately during site preparation and replaced on completion where revegetation will take place.* • *Any site camps and laydown areas requiring*	**LOW -** **LOW -**

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	associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would result in no impact on vegetation.*			*clearing must be located within already disturbed areas as far as possible, or away from watercourses, alluvial areas and other sensitive features (rocky outcrops).*	
POTENTIAL TERRESTRIAL BIODIVERSITY IMPACTS **FLORA SPECIES**	Loss of flora species of special concern during pre-construction site clearing activities. Several special of concern are known from surrounding areas, which could be destroyed during site preparation. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on floral species.*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	*A flora search and rescue is recommended before commencement.* *Respective permits to be obtained beforehand.*	**LOW -** **LOW -**
POTENTIAL TERRESTRIAL BIODIVERSITY IMPACTS **ALIEN INVASIVE SPECIES**	Susceptibility of post construction disturbed areas to invasion by exotic and alien invasive species and removal of exotic and alien invasive species during construction. Post construction disturbed areas having no vegetation cover are often susceptible to invasion by weedy and alien species, which can not only become invasive but also prevent natural flora from becoming established. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	*Alien trees and weeds must be removed from the site as per CARA/ NEMBA requirements.* *A suitable weed and alien invasive plant management plan to be implemented in construction and operation phases.* *After clearing and construction is completed, an appropriate cover crop may be required, should natural re-establishment of grasses not take place in a timely manner, such as along road verges. This will also minimise dust.*	**LOW -** **LOW -**

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	developer and the EMPrs will be prepared to the same standard. *No-go alternative would result in no impact on alien invasive species.*				
POTENTIAL TERRESTRIAL BIODIVERSITY IMPACTS **EROSION**	Susceptibility of some areas to erosion because of construction related disturbances. Removal of vegetation cover and soil disturbance may result in some areas being susceptible to soil erosion after completion of the activity. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on erosion.*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	• *Suitable measures must be implemented in areas that are susceptible to erosion. Areas must be rehabilitated, and a suitable cover crop planted once construction is completed.* • *Topsoil must be stripped and stockpiled separately and replaced on completion.* • *If natural vegetation re-establishment does not occur, a suitable grass must be applied.*	**LOW -** **LOW -**
POTENTIAL TERRESTRIAL BIODIVERSITY IMPACTS **ECOLOGICAL PROCESSES**	Disturbances to ecological processes: Activity may result in disturbances to ecological processes such as fragmentation (road, etc). *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on ecological processes.*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	• *Blanket clearing of vegetation must be limited to the development footprint, and the area to be cleared must be demarcated before any clearing commences.*	**LOW -** **LOW -**
POTENTIAL	Aquatic and Riparian processes: Diversion and	**DIRECT**	**MODERATE -**	• *Suitable structures to be constructed at*	**LOW -**

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TERRESTRIAL BIODIVERSITY IMPACTS **AQUATIC AND RIPARIAN PROCESSES**	increased velocity of surface water flows – Changes to the hydrological regime and increased potential for erosion. Impact of changes to water quality. Loss of riparian vegetation / aquatic habitat. Loss of species of special concern. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on aquatic and riparian processes.*	**CUMULATIVE** **NO-GO**	**MODERATE -**	*watercourse crossings that do not alter flows.* • *Stormwater discharge into watercourses to be protected against erosion.*	**LOW -**
POTENTIAL TERRESTRIAL BIODIVERSITY IMPACTS **FAUNAL HABITAT**	Loss of Faunal Habitat: Activity may result in the loss of habitat for faunal species, which could result in disturbance and displacement of faunal species. *Cumulative impact, on a localised scale, would be LOW should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on faunal habitat.*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	• *Blanket clearing of vegetation must be limited to the construction footprint required.* • *Rocky outcrop areas and Riverine Rabbit Habitat to be avoided as far as possible.* • *It is important that clearing activities are kept to the minimum and take place in a phased manner, where applicable. This allows any smaller animal species to move into safe areas and prevents wind and water erosion of the cleared areas.*	**LOW -** **LOW -**
POTENTIAL TERRESTRIAL BIODIVERSITY IMPACTS	Impacts to faunal processes because of the activity such as erection of barriers to movement. *Cumulative impact, on a localised scale, would be LOW should the Taaibos and Soutrivier WEF clusters*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	• *The habitats and microhabitats present on the project site are not unique and are widespread in the general area, hence the local impact associated with the footprint would be of low significance if mitigation*	**LOW -** **LOW -**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
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FAUNAL PROCESSES	*construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on faunal procesess.*			*measures are adhered to.* • *Small mammals within the habitat on and around the affected area are generally mobile and likely to be transient to the area. They will most likely vacate the area once construction commences. As with all construction sites there is a latent risk that there will be some accidental mortalities. Specific measures are made to reduce this risk. The risk of species of special concern is low, and it is unlikely that there will be any impact to populations of such species because of the activity.* • *Reptiles such as lizards are less mobile compared to mammals, and some mortalities could arise. It is recommended that a faunal search and rescue be conducted before construction commences, although experience has shown that there could still be some mortalities as these species are mobile and may thus move onto site once construction is underway. A retile handler should be on call for such circumstances.* • *Should any amphibian migrations occur between wetland areas during construction, appropriate measures (including temporarily suspending works in the affected area) should be implemented.*	
POTENTIAL TERRESTRIAL BIODIVERSITY IMPACTS **FAUNAL SPECIES**	Loss of faunal SSC due to construction activities: Activities associated with bush clearing, killing of perceived dangerous fauna, may lead to increased mortalities among faunal species. *Cumulative impact, on a localised scale, would be*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -**	• *A pre-commencement faunal search and rescue is recommended.* • *Respective permits to be obtained beforehand.* • *No animals are to be harmed or killed during the course of operations.*	**LOW -** **LOW -**

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	moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would result in no impact on faunal species.*			• *Workers are NOT allowed to snare any faunal species.*	
POTENTIAL RISKS TO FAUNA SPECIES OF CONSERVATION CONCERN: **HABITAT LOSS, DEGRADATION AND FRAGMENTATION**	The development may fragment an already highly fragmented landscape which may create barriers to geneflow where subpopulations are disconnected and isolated. Roads and fences can affect the quality and quantity of available habitat, most notably through fragmentation, creating barriers to animal movement. Erosion from construction may degrade the habitat and direct loss of habitat will occur due to necessity of access roads. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on habitat loss, degradation and fragmentation with regards to faunal species.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -**	• *Minimising the project footprint by utilising existing roads and disturbed areas as much as technically possible.* • *Locate developments away from identified sensitive habitats, this includes no go zones and buffer zones for turbine pads, electrical substations and housing facilities as well as construction laydown areas.* • *Implementing adequate dust control and erosion control.* • *Careful planning of road layout to minimise the length of roads traversing through riverine habitats and rocky ridges that have been identified as Very high or high sensitivity which may create barriers and fragment habitats.* • *Establish wildlife passes, where artificial barriers are found; this particularly refers to physical barriers such as roads and fences.* • *Develop and implement a site-specific spill management plan.*	**LOW -** **LOW -**
POTENTIAL RISKS TO FAUNA SPECIES OF CONSERVATION CONCERN:	Disturbance will be primarily in the form of visual and noise effects as well as general human activities. Visual stimuli from movements of the turbine blades may cause a disturbance which may be far reaching	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -**	• Implementing adequate noise reduction measures, including the use of insulation to reduce noise output from turbine hubs. • Temporal (curtailment) restrictions.	**LOW -** **LOW -**

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DISTURBANCE	due to the site being open and unobscured. Noise effect from construction and associated human activities during this phase is highly probable. This impact will reduce once the WEF is operational however there will be continued noise pollution from turbines from both the hub and the swish of the blades. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on disturbance of faunal species of conservation concern.*			Temporal restriction strategies can focus on altering turbine operation during times or weather conditions when wildlife is most active or where a negative impact has been found during the monitoring program. Targeted operational timing by working with wind facility managers to target specific turbines under certain weather conditions where a negative impact has been identified. This may require changing the minimum windspeed at which turbines begin to turn and generate energy (cut-in speed) so that they idle during gentle wind and in so doing reduce noise during periods of low ambient noise. Minimise development lighting in order to minimise light pollution, disturbance to animals at night; Minimize noise disturbance during constructions where construction takes place within 1000 m of Very high and high sensitivity habitats. Restricting noise to daytime (9 am – 4 pm) periods when most fauna are less active.	
POTENTIAL RISKS TO FAUNA SPECIES OF CONSERVATION CONCERN: **MORTALITY FROM ROAD COLLISION**	There is an increased collision risk from increased traffic levels at the site and in the general area. This impact is likely to be of highest concern during construction but is also expected during the operational phase. Roads and roadsides may attract SCC such as Riverine Rabbits and Karoo Dwarf Tortoises due to verge edge enhancement of vegetation and roads may be used to facilitate movement, thus further increasing collision risks.	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -**	Careful planning of roads to minimise the length that traverses through riverine and rocky habitats that have been identified as Very high or high sensitivity. Use existing roads as much as possible. Roadkill monitoring program on both internal and external public roads targeting sensitive habitats and wildlife corridors. Roadkill Monitoring programs must be initiated at	**LOW -** **LOW -**

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	Access roads that traverse riverine habitats require careful planning and monitoring to reduce risk of rabbit mortality. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on faunal species in relation to road collision mortality.*			pre-construction phase and continued during construction and post-construction as well as conducted over different seasons. • Pre-construction road planning to identify target sites for wildlife crossing structures which should be considered during the EIA process and with pre-construction roadkill monitoring findings. Wildlife crossing structures must be made in consultation with road planner, construction manager and wildlife biologist. This is generally more cost effective than retro fixing existing roads. • Assess efficiency of roadkill mitigation approaches via a post-implementation roadkill monitoring program. • Implementation of speed limits on both internal access WEF roads (40km/h) as well as external public roads (60km/h). • Reduced speed limits of 30km/h where roads (both internal and external) cross High and Very high sensitivity areas identified; including riverine habitat, koppies and ecotones which may harbour sensitive species and generally have higher species diversity and abundance • Wildlife warning signage and speed reduction measures where roads cross High and Very high sensitivity areas. • Education and awareness campaigns on SCC and their habitat must form part of staff induction procedures to help increase awareness, respect and responsibility towards the environment for all staff and	

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				contractors. • Inductions on safe wildlife passing and driving to reduce possible injury and roadkill alongside roads. • There is higher risk of collision when animals are more active which is typically from late afternoon to early morning. During these times a low speed limit (30km/h) needs to be implemented. Night-time driving should be avoided as much as possible but if necessary, speed needs to be reduced significantly to avoid collisions. Lagomorph species (hares and rabbits) often freeze in headlights and require headlights to be momentarily turned off to allow the animal to move off the road. • Reduced speeds also need to be implemented during reduced visibility such as misty conditions that have been observed on the site. • Induction must include reporting of any vehicle/wildlife collision or found roadkill to the appointed Roadkill monitoring personnel. • Search and rescue of slow-moving species, specifically Karoo Dwarf Tortoises, during the construction phase. IUCN guidelines for translocation of sensitive species should be consulted. Tortoises will need to be carefully relocated and provided shelter and water-rich food as well as monitoring of threatened species to ensure of their survival. Should a subpopulation be found further consultations with a herpetologist will be required for appropriated mitigation.	

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POTENTIAL RISKS TO FAUNA SPECIES OF CONSERVATION CONCERN: **CUMULATIVE IMPACT**	The cumulative impact is of concern, given the fact that the renewable-energy industry is rapidly expanding in South Africa. The local fauna is already impacted and threatened by past and current land use and the combination of these existing anthropogenic impacts with planned developments may impact the local fauna with unexpectedly large effects. Cumulative effects can also result where the construction phase occurs at several locations simultaneously or if a new project begins construction immediately following the completion of another. Cumulative effects can cause a small localized effect (which may have a limited effect on its own) to have a significant impact on population level as there may be thresholds where the cumulative effects increase disproportionally. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact from a cumulative faunal species of conservation concern loss perspective.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -**	• *It is important to evaluate the consequences of each development before the next is begun.* • *Use a precautionary approach and aim to minimise negative effects even when the effects are not fully known.* • *Ensure the construction phase is done in as short a period as possible and avoid breeding season, typically in the spring after good rains.* • *Construction needs to be done during daytime, avoiding noise and disturbance when faunal communities are most likely active, particularly where the construction is in proximity to their habitat. Sensitive habitats near construction will need to be clearly marked.* • *Relating construction phase of the development with neighbouring developments and farming activity to ensure construction does not begin immediately after the completion of another or simultaneously.* • *The developer instigates a proactive mitigation measure by initiating a multi-stakeholder dialogue at a workshop to clarify these concerns and how they might be taken forward and co-funded. The aim of this mitigation is to reduce current impacts that threaten the survival of SCC populations. We recommend a biodiversity wildlife corridor approach whereby protecting sensitive habitats is made a priority. This may include species refuge areas where no form of*	**LOW -** **LOW -**

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				indiscriminate wildlife killing/snaring is allowed, no or highly reduced livestock grazing, and no pest control including locust spraying is carried out. • *Poaching and the use of hunting dogs at site is prohibited.*	
POTENTIAL RISKS TO FAUNA SPECIES OF CONSERVATION CONCERN: **CASCADING IMPACT ACROSS TROPHIC LEVELS**	The effect of the wind farm on one species may have indirect cascading effects (knock on effect) on other species within the same community due to ecological relations to one another. This means that an effect on one species may in turn affect many others within the same ecosystem. Cascading effects may be complex and unpredictable as it may be the result of different types of interactions including competition, predation, parasitism, or symbiosis. *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters construction timelines overlap. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no cascading impact across the trophic levels due to the proposed WEF.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -**	• *Initiate a general Fauna Biodiversity Monitoring program* • *A Fauna Biodiversity program must be initiated pre-construction to have baseline population status and monitoring must be ongoing post-construction to identify any changes in occupancy in certain species' population which may in turn indirectly impact other fauna populations.* • *We recommend the use of multiple monitoring methods including and not limited to; camera trapping in diverse habitats, targeted camera trapping for SCC; small mammal monitoring with the use of Sherman traps; the use of Conservation Scent Detection Dog teams to assist in detecting SCC.*	**LOW -** **LOW -**
VISUAL IMPACT ASSESSMENT					
POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON SENSITIVE VISUAL RECEPTORS IN CLOSE PROXIMITY (< 5KM)	The visual impacts of facility operations on sensitive visual receptors (i.e., residents of homesteads, as well as, observers travelling along the secondary road) in close proximity to the proposed Taaibos South WEF (within 5km) is expected to be of very high significance.	**DIRECT** **CUMULATIVE** **NO-GO**	**VERY HIGH -** **VERY HIGH -**	• *Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.* • *Maintain the general appearance of the facility as a whole.* • *Monitor rehabilitated areas, and implement remedial action as and when required.*	**VERY HIGH -** **VERY HIGH -**

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TO THE PROPOSED DEVELOPMENT	Sensitive visual receptors within this zone include: ▪ Users of the various secondary roads ▪ Residents of the following homesteads: o Taaibosfontein o Erasmuskraal o Ramfontein The following homesteads are located on farm portions earmarked for the Victoria West WEF, thereby reducing the probability of this impact occurring on these specific receptors (i.e. it is assumed that these landowners are supportive of WEF developments and their associated visual impacts): ▪ Altona ▪ Spes Bona ▪ Lakenvlei ▪ Stampfontein ▪ Quaggasfontein *Cumulative impact, on a localised scale, would be very high should the Taaibos and Soutrivier WEF clusters operational timelines overlap, which is likely. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on sensitive visual receptors.*				
POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON SENSITIVE VISUAL	The visual impact of facility operations on sensitive visual receptors (i.e. users of the various secondary roads and residents of homesteads) within the local area (between 5 - 10km offset) is expected to be of	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **HIGH -**	➢ *Retain / re-establish and maintain large trees, natural features and noteworthy natural vegetation in all areas outside of the activity footprint.*	**HIGH -** **HIGH -**

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RECEPTORS WITHIN THE LOCAL AREA (BETWEEN 5 - 10KM) SURROUNDING THE PROPOSED DEVELOPMENT	high significance. Sensitive visual receptors within this zone include: ▪ Users traveling along the various secondary roads, potential visibility is however scattered along the length of these roads and visual intrusion where possible will be brief. ▪ Residents of the following homesteads: o Arizona o Schimmelfontein o Taaibosfontein o Suikerkolk o Duikerfontein o Ramfontein The following homesteads are located on farm portions earmarked for the Victoria West WEF, thereby reducing the probability of this impact occurring on these specific receptors (i.e. it is assumed that these landowners are supportive of WEF developments and their associated visual impacts): ▪ Boshoek ▪ Oppermanskraal ▪ Slypfontein ▪ Stampfontein *Cumulative impact, on a localised scale, would be high should the Taaibos and Soutrivier WEF clusters operational timelines overlap, which is likely. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the*			⅄ *Retain natural pockets (wetland, river and other sensitive vegetation zones) as buffers within the property and along the perimeter.* ⅄ *Dust suppression techniques should be in place at all times during the site development and operational phases.* ⅄ *Access roads will require an effective dust suppression management programme, such as regular wetting and/or the use of non-polluting chemicals that will retain moisture in the road surface.* ⅄ *Downscaling of operations.* ⅄ *Keeping infrastructure at minimum heights.* ⅄ *Introducing landscaping measures such as vegetating berms.* ⅄ *Avoid the use of highly reflective material.* ⅄ *Metal surfaces, where they occur, should be painted in natural soft colours that would blend in with the environment.* ⅄ *Maintain the general appearance of the site as a whole.* ⅄ *Lighting should be kept to a minimum wherever possible.* ⅄ *Install light fixtures that provide precisely directed illumination to reduce light "spillage" beyond the immediate surrounds of the activity – this is especially relevant where the edge of the activity is exposed to residential properties.* ⅄ *Wherever possible, lights should be directed downwards to avoid illuminating the sky.* ⅄ *Avoid high pole top security lighting along the periphery of the site and use only lights that*	

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	same standard. *No-go alternative would result in no impact on sensitive visual receptors.*			*are activated on movement.*	
POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON SENSITIVE VISUAL RECEPTORS WITHIN THE DISTRICT (BETWEEN 10 - 20KM) SURROUNDING THE PROPOSED DEVELOPMENT	The visual impact of facility operations on sensitive visual receptors (i.e. users of the various secondary road, arterial R63 and the national N12 road, visitors to region, and residents of homesteads) within the district (between 10 - 20km offset) is expected to be of moderate significance. Sensitive visual receptors within this zone include: ▪ Users traveling along portions of the N12, R63 and various secondary roads, potential visibility is however scattered along the length of these roads and visual intrusion where possible will be brief. ▪ Residents of the following homesteads: o Rietfontein o Klipgat o Witbank o Ystervarkpoort o Moreson o Bitterwater o Meltonwold o Rooivlakte o Biesiespoort o Burgershoek o Suikerkolk o Jakkalsdans o Nuwelande o Duikerfontein o Droëfontein o Midlands o Slangfontein	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -**	⅄ *Retain / re-establish and maintain large trees, natural features and noteworthy natural vegetation in all areas outside of the activity footprint.* ⅄ *Retain natural pockets (wetland, river and other sensitive vegetation zones) as buffers within the property and along the perimeter.* ⅄ *Dust suppression techniques should be in place at all times during the site development and operational phases.* ⅄ *Access roads will require an effective dust suppression management programme, such as regular wetting and/or the use of non-polluting chemicals that will retain moisture in the road surface.* ⅄ *Downscaling of operations.* ⅄ *Keeping infrastructure at minimum heights.* ⅄ *Introducing landscaping measures such as vegetating berms.* ⅄ *Avoid the use of highly reflective material.* ⅄ *Metal surfaces, where they occur, should be painted in natural soft colours that would blend in with the environment.* ⅄ *Maintain the general appearance of the site as a whole.* ⅄ *Lighting should be kept to a minimum wherever possible.* ⅄ *Install light fixtures that provide precisely directed illumination to reduce light "spillage" beyond the immediate surrounds of the*	**MODERATE -** **MODERATE -**

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	○ Uilspoort ○ Grootfontein ○ Taaiboschfontein ○ Rocklands ○ Vlakfontein ○ Leeufontein ○ Gansfontein ○ Bultfontein The following homesteads are located on farm portions earmarked for the Victoria West WEF, thereby reducing the probability of this impact occurring on these specific receptors (i.e. it is assumed that these landowners are supportive of WEF developments and their associated visual impacts): ▪ Oppermanskraal ▪ Stampfontein ▪ Oorlogsfontein ▪ Slypfontein *Cumulative impact, on a localised scale, would be moderate should the Taaibos and Soutrivier WEF clusters operational timelines overlap, which is likely. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on sensitive visual receptors.*			*activity – this is especially relevant where the edge of the activity is exposed to residential properties.* *Wherever possible, lights should be directed downwards to avoid illuminating the sky.* *Avoid high pole top security lighting along the periphery of the site and use only lights that are activated on movement.*	
POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON	The visual impact of facility operations on sensitive visual receptors (i.e., users of the various secondary roads, visitors to the region, and residents of	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -**	*Retain / re-establish and maintain large trees, natural features and noteworthy natural vegetation in all areas outside of the activity*	**LOW -** **LOW -**

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SENSITIVE VISUAL RECEPTORS WITHIN THE REGION (> 20KM)	homesteads) within the region (beyond the 20km offset) is expected to be of low significance. Sensitive visual receptors within this zone include: ▪ Users traveling along portions of the N12, R63, R381 and various secondary roads, potential visibility is however scattered along the length of these roads and visual intrusion where possible will be brief. ▪ Residents of various homesteads (refer to Section 6.6 of the VIA for a full list). The following homesteads are located on farm portions earmarked for the Victoria West WEF, thereby reducing the probability of this impact occurring on these specific receptors (i.e. it is assumed that these landowners are supportive of WEF developments and their associated visual impacts): ▪ Liebenbergsdam ▪ Boschrug ▪ Blindefontein ▪ Drupfontein ▪ Middlewater *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters operational timelines overlap, which is likely. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on sensitive visual receptors.*			*footprint.* ▲ *Retain natural pockets (wetland, river and other sensitive vegetation zones) as buffers within the property and along the perimeter.* ▲ *Dust suppression techniques should be in place at all times during the site development and operational phases.* ▲ *Access roads will require an effective dust suppression management programme, such as regular wetting and/or the use of non-polluting chemicals that will retain moisture in the road surface.* ▲ *Downscaling of operations.* ▲ *Keeping infrastructure at minimum heights.* ▲ *Introducing landscaping measures such as vegetating berms.* ▲ *Avoid the use of highly reflective material.* ▲ *Metal surfaces, where they occur, should be painted in natural soft colours that would blend in with the environment.* ▲ *Maintain the general appearance of the site as a whole.* ▲ *Lighting should be kept to a minimum wherever possible.* ▲ *Install light fixtures that provide precisely directed illumination to reduce light "spillage" beyond the immediate surrounds of the activity – this is especially relevant where the edge of the activity is exposed to residential properties.* ▲ *Wherever possible, lights should be directed downwards to avoid illuminating the sky.* ▲ *Avoid high pole top security lighting along the*	

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				periphery of the site and use only lights that are activated on movement.	
POTENTIAL VISUAL IMPACT OF OPERATIONAL LIGHTING AT NIGHT ON SENSITIVE VISUAL RECEPTORS IN THE REGION	The receiving environment has a relatively small number of populated places, and it can be expected that any light trespass and glare from the security and after-hours operational lighting for the facility will have some significance. In addition, the remote sense of place and rural ambiance of the local area increases its sensitivity to such lighting intrusions. Another source of glare light is the aircraft warning lights mounted on top of the hub of the wind turbines. While these lights are less aggravating due to the toned-down red colour, they do have the potential to be visible from a greater distance then general operational lighting, especially due to the strobing effect of the lights, a function specially designed to attract the viewers' attention. The Civil Aviation Authority (CAA) prescribes these warning lights and the potential to mitigate their visual impacts is low. The possibility of limiting aircraft warning lights to the turbines on the perimeter according to CAA requirements, thereby reducing the overall impact, is recommended to be investigated. Some ground-breaking new technology in the development of strobing lights that only activate when an aircraft is detected nearby. This may aid in restricting light pollution at night and should be investigated and implemented by the project proponent, if available and permissible by the CAA. This new technology is referred to as needs-based night lights, which basically deactivates the wind	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **HIGH -**	▲ *Aviation standards and CAA Regulations for turbine lighting must be followed.* ▲ *The possibility of limiting aircraft warning lights to the turbines on the perimeter according to CAA requirements, thereby reducing the overall impact, must be investigated.* ▲ *Install aircraft warning lights that only activate when the presence of an aircraft is detected, if permitted by CAA.* ▲ *Shield the sources of light by physical barriers (walls, vegetation, or the structure itself).* ▲ *Limit mounting heights of lighting fixtures, or alternatively use foot-lights or bollard level lights.* ▲ *Make use of minimum lumen or wattage in fixtures.* ▲ *Make use of down-lighters, or shielded fixtures.* ▲ *Make use of Low-Pressure Sodium lighting or other types of low impact lighting.* ▲ *Make use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.*	**MODERATE -** **MODERATE -**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	turbine's night lights when there is no flying object within the airspace of the WEF. The system relies on the active detection of aircraft by radar sensors, which relays a switch-on signal to the central wind farm control to activate the obstacle lights. Last is the potential lighting impact is known as sky glow. Sky glow is the condition where the night sky is illuminated when light reflects off particles in the atmosphere such as moisture, dust or smog. The sky glow intensifies with the increase in the number of light sources. Each new light source, especially upwardly directed lighting, contributes to the increase in sky glow. The general lighting of the facility may contribute to the effect of sky glow in an otherwise dark environment. The visual impacts as a result of operational lighting at night on sensitive visual receptors in the region is likely to be of high significance and may be mitigated to moderate should the required CAA lighting be approved to be installed on the perimeter and/or the installation of needs-based night lights be allowed. Best practice guidelines for other general site lighting that may occur on the site have also been taken into consideration. *Cumulative impact, on a localised scale, would be high should the Taaibos and Soutrivier WEF clusters operational timelines overlap, which is likely. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the*				

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	same standard. *No-go alternative would result in no impact on sensitive visual receptors.*				
POTENTIAL VISUAL IMPACT OF SHADOW FLICKER ON SENSITIVE VISUAL RECEPTORS IN CLOSE PROXIMITY TO THE PROPOSED DEVELOPMENT	Shadow flicker only occurs when the sky is clear, and when the turbine rotor blades are between the sun and the receptor (i.e. when the sun is low). De Gryse in Scenic Landscape Architecture (2006) found that "most shadow impact is associated with 3-4 times the height of the object". Based on this research, a 1.3km buffer along the edge of the outer most turbines is identified as the zone within which there is a risk of shadow flicker occurring. One unamed homestead is located within the 1.3km buffer. Of note is that this homestead is located on a property involved in this development, thereby reducing the probability of this impact occurring. It is expected that the shadow flicker experienced by motorist traveling along roads will be fleeting and not constitute a shadow flicker visual impact of concern. *Cumulative impact, on a localised scale, would be high should the Taaibos and Soutrivier WEF clusters operational timelines overlap, which is likely. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact on sensitive visual receptors.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -**	➢ *None possible.*	**MODERATE -** **MODERATE -**
WAKE EFFECT STUDY					
WAKE EFFECTS	The operational Noblesfontein WEF does lie downwind of an important wind sector, but distance	**DIRECT** **CUMULATIVE**	**NO IMPACT**	➢ *None suggested*	**NO IMPACT**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	and terrain effects are likely to mean no significant impact is experienced at that site. *Cumulative impact, on a localised scale, would be low should the Taaibos and Soutrivier WEF clusters operational timelines overlap, this is likely. However, it is important to note that the 5 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to wake effect as no WEFs would be present on these land parcels.*	**NO-GO**			
DECOMMISSIONING PHASE ****DUE TO THE FACT THAT NO WIND ENERGY FACILITY'S HAVE BEEN DECOMMISSIONED IN SOUTH AFRICA, CES BELIEVES IT RESPONSIBLE TO STIPULATE THAT FUTHER ASSESSMENT IN THE FORM OF A DECOMISSIONING ENVIRONMENTAL MANAGEMENT PROGRAMME BE DRAFTED, IN CONSULTATION WITH SPECIALISTS, WHEN THIS PHASE BECOMES RELEVANT.**					
AGRICULTURAL IMPACT ASSESSMENT					
The agricultural impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.					
AQUATIC IMPACT ASSESSMENT					
The aquatic impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.					
AVIFAUNAL IMPACT ASSESSMENT					
The avifaunal impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.					
BAT IMPACT ASSESSMENT					
The bat impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.					
HERITAGE IMPACT ASSESSMENT					
The heritage impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.					
NOISE IMPACT ASSESSMENT					

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
The noise impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.					
PALAEONTOLOGICAL IMPACT ASSESSMENT					
None identified by specialist					
RIVERINE RABBIT IMPACT ASSESSMENT					
The socio-economic impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.					
SOCIO-ECONOMIC IMPACT ASSESSMENT					
The socio-economic impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.					
TERRESTRIAL BIODIVERSITY IMPACT ASSESSMENT					
The terrestrial biodiversity impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.					
VISUAL IMPACT ASSESSMENT					
The visual impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.					
WAKE EFFECT STUDY					
None identified by specialist					

9.4 SUMMARY OF FINDINGS AND COMPARATIVE ASSESSMENT OF IMPACTS

This section includes summaries of each field, including the direct/indirect and cumulative impacts. No-go impacts have not been totalled in this section as they relate to the status quo and have been summarised in **Error! Reference source not found.** and **Error! Reference source not found.**.

9.4.1 GENERAL IMPACTS

All the general negative impacts could be mitigated to either LOW negative or MODERATE negative. Of the 55 impacts, 28 are direct and indirect impacts, while 27 are cumulative impacts. No-go impacts are not represented in this summary and can be found in Section 9.2 and Appendix H.

Table 9-7: General Impact Summary.

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Planning & Design	1	0	6	0	7	0	0	0	13	0	1	0	0	0	0	0
Construction	0	0	11	0	7	0	0	0	16	0	2	0	0	0	0	0
Operations	0	0	6	0	2	2	0	0	8	0	2	0	0	2	0	0
Decommissioning	0	2	10	0	0	0	0	0	8	2	0	0	0	0	0	0
TOTAL	**1**	**2**	**33**	**0**	**16**	**2**	**0**	**0**	**45**	**2**	**5**	**0**	**0**	**2**	**0**	**0**

9.4.2 AGRICULTURE IMPACT

The agricultural impacts are all (12 impacts) of LOW significance both pre- and post-mitigation (Table 9-8). Four (4) of the impacts are LOW positive significance and eight (8) of the impacts are LOW negative significance.

Table 9-8: Agricultural Potential Impact Summary.

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	4	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0
Operations	4	4	0	0	0	0	0	0	4	4	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**8**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**4**	**0**	**0**	**0**	**0**	**0**	**0**

9.4.3 AQUATIC IMPACT

Of the twelve (14) impacts, seven (7) are of a LOW negative significance, five (5) are of a MODERATE negative significance and two (2) are of a HIGH negative significance. Post mitigation all impacts are LOW negative (Table 9-).

Table 9-9: Aquatic Impact Summary.

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	3	0	5	0	2	0	0	0	10	0	0	0	0	0	0	0
Operations	4	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TOTAL	**7**	**0**	**5**	**0**	**2**	**0**	**0**	**0**	**14**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

9.4.4 AVIFAUNAL IMPACT

The Avifaunal Impact Assessment rated most of its impacts as MODERATE negative pre-mitigation (19 impacts). The majority of the impacts can be mitigated to LOW negative post-mitigation impacts, with six (6) remaining at a MODERATE significance (Table 9-).

Table 9-10: Avifaunal Impact Summary.

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	4	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0
Operations	4	0	8	0	0	0	0	0	6	0	6	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**8**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**10**	**0**	**6**	**0**	**0**	**0**	**0**	**0**

9.4.5 BAT IMPACT

The Bat Impact Assessment identified four (4) operational impacts and rated three (3) as HIGH negative pre-mitigation, this includes both direct and cumulative impacts related to barotrauma. All impacts can be mitigated to LOW or MODERATE post-mitigation significance (Table 9-).

Table 9-11: Bat Impact Summary.

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	0	0	1	0	1	0	0	0	0	0	2	0	0	0	0	0
Operations	1	0	0	0	3	0	0	0	1	0	3	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**1**	**0**	**1**	**0**	**4**	**0**	**0**	**0**	**1**	**0**	**5**	**0**	**0**	**0**	**0**	**0**

9.4.6 HERITAGE IMPACT

The pre-mitigation heritage impacts are mostly rated as LOW negative significance. These relate to the occurrence of Middle Stone Age as well as Early Stone Age archaeological material and more recent historical remains such as stone walling and building ruins on the site as well as the greater surrounds of the area. The impacts can be all be mitigated to LOW negative significance post-mitigation Table 9-12).

Table 9-42: Heritage Impact Summary.

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	3	0	1	0	0	0	0	0	4	0	0	0	0	0	0	0
Operations	4	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**7**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

9.4.7 NOISE IMPACT

The noise impacts based on the current layout are all LOW negative significance both pre- and post-mitigation (9-13).

Table 9-53: Noise Impact Summary.

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	4	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0
Operations	4	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

9.4.8 PALAEONTOLOGY IMPACT

The pre-mitigation impacts are both LOW negative significance pre- and post-mitigation (Table 9-6).

Table 9-6: Palaeontology Impact Summary.

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
Operations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

9.4.9 RIVERINE RABBIT IMPACT

All impacts identified in the Riverine Rabbit Assessment and can be mitigated to LOW negative post-mitigation (Table 9-75).

Table 9-75: Traffic Impact Summary

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	0	0	2	0	4	0	0	0	6	0	0	0	0	0	0	0
Operations	0	0	2	0	4	0	0	0	6	0	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**4**	**0**	**8**	**0**	**0**	**0**	**12**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

9.4.10 SOCIO-ECONOMIC IMPACT

The social study identified 38 impacts, comprising 18 negative impacts and 20 positive impacts related to the proposed development. The negative impacts are mostly of a MODERATE negative significance (56%) and a LOW negative significance (44%), with no HIGH negative pre-mitigation significance. There are no high negative post-mitigation impacts and the majority of the remaining negative impacts are of a LOW negative significance (61%) post-mitigation. Of the 20 positive impacts identified the majority are of a MODERATE OR LOW positive significance (90%) pre-mitigation, with 2 HIGH positive pre-mitigation impacts. Post-mitigation, 16 (80%) of the impacts are MODERATE positive. It is clear that with mitigation measures in place the positive impacts can be enhanced (Table 9-8).

Table 9-8: Social Impact Summary

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+

Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	2	5	6	3	0	2	0	0	5	2	3	6	0	2	0	0
Operations	6	4	4	6	0	0	0	0	6	0	4	10	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**8**	**9**	**10**	**9**	**0**	**2**	**0**	**0**	**11**	**2**	**7**	**16**	**0**	**2**	**0**	**0**

9.4.11 TERRESTRIAL BIODIVERSITY IMPACT

Of the 54 ecological impacts identified 50% of the impacts are of a MODERATE and 50% are LOW negative pre-mitigation significance. These impacts can be mitigated to 100% LOW negative significance. No high were identified in the pre- or post-mitigation phases.

Table 9-9: Terrestrial Biodiversity Impact Summary.

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	14	0	14	0	0	0	0	0	28	0	0	0	0	0	0	0
Operations	14	0	14	0	0	0	0	0	28	0	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**28**	**0**	**28**	**0**	**0**	**0**	**0**	**0**	**56**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

9.4.12 VISUAL IMPACT

The Visual Assessment identified a total of 14 impacts. The majority of these impacts related to the visual impact of the proposed WEF on sensitive receptors during the operation of the WEF. There are two (2) HIGH and two (2) VERY HIGH negative significance impacts that cannot be mitigated due to the fact that they are perception-based (Table 9-8).

Table 9-18: Visual Impact Summary

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0
Operations	2	0	4	0	4	0	2	0	2	0	6	0	2	0	2	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**2**	**0**	**4**	**0**	**6**	**0**	**2**	**0**	**2**	**0**	**8**	**0**	**2**	**0**	**2**	**0**

9.4.13 WAKE EFFECT

The Wake Effect Study concluded that there are no impacts worth rating and that the overall impact is negligible (Table 9-9).

Table 9-19: Wake Effect Study Summary

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

9.4.14 CUMULATIVE IMPACT

Overall, the cumulative impact of the proposed Taaibos South WEF, when neighbouring existing and authorised WEFs are considered is HIGH negative. Cumulative impacts, as previous stated, are notoriously difficult to mitigate since environmental legislation, related to monitoring, construction and operation, changes over time. Developers are therefore not always prescribed the same standards of environmental care. In addition to this, cumulative impacts can only be assessed using available data and in some cases older EIAs did not assess impacts to the same level of detail, e.g. specialist studies can vary drastically, which means that data is often limited.

It is concluded that majority of the post-mitigation cumulative impacts are MODERATE in nature and although the many of the cumulative impacts of the proposed Soutrivier and Taaibos WEF clusters in the area will be HIGH, the fact that the same developer is developing a the cluster of WEFs, resulting in the standard of the EMPr and ECOs being consistent means that this can be mitigated to MODERATE.

9.4.15 NO-GO ALTERNATIVE

The no-go alternatives of the remainder of the impacts mean that the site and its surrounding remain as is (status quo). This means that the negative impacts described in this report would not transpire and nor would the positive impacts.

DRAFT

10 SENSITIVITY ANALYSIS

A site development sensitivity map (Figure 10-1) were developed based on specialist and general site information gathered, and the site was classified into areas of low and conditional sensitivity and NO-GO no development).

- NO-GO areas included areas of high sensitivity indicated by the bird and bat specialists (specific to turbines, rather than roads), identified heritage sites and buffers around existing infrastructure (including a 500m buffer around all noise sensitive areas).
- **Conditional Sensitivity** areas are areas where construction is conditional on the fulfilment of one or another aspect-specific requirement. For example, all construction in the Heritage conditional sensitivity areas will require sign-off by a palaeontologist to ensure that no fossils (if found) are damaged or destroyed. Other conditional sensitivity areas include areas of moderate sensitivity identified by the bird and bat specialist and ecologically sensitive areas such as watercourses, wetlands, and thicket vegetation.
- **Low Sensitivity** areas are areas where construction may take place without hindrance.

The main objective of the sensitivity analysis is to guide development away from sensitive areas and have development footprints located in areas of lower sensitivity. We have previously used the terms go area; do-but area; and no-go area.

The limitation of the above is that a no-go area is just that – one cannot ever do anything in this area, because its **no-go.** But in certain cases, development is required. A road crossing over a stream, or some other linear infrastructure, which can be developed, provided there is sound mitigation and other constraints are applied. So, it is not no-go but developmentally constrained.

It is therefore preferable to use and map the following categories:
LOW CONSTRAINT/NONE IDENTIFIED - These areas can be easily developed, as there are only minor constraints, and little mitigation and management is required (aside from normal building design and construction restrictions outlined in the EMPr).
LOW-MODERATE CONSTRAINT – These areas can be developed but require mitigation and management as per the general management conditions of the EMPr.
MODERATE CONSTRAINT - These areas can accommodate development, but there are constraints. Mitigation and management will be required to reduce significant environmental impacts to acceptable levels, and appropriate technology (sewage, waste etc.) and design will be required to reduce impacts and ensure sustainability. Sound arguments as to why the development cannot be located in less sensitive areas will be required to justify locating development in moderately constrained areas.
MODERATE-HIGH CONSTRAINT – These areas can accommodate development, but there are strict constraints. Mitigation and management will be required to reduce significant environmental impacts to acceptable levels. Sound arguments as to why the development cannot be located in less sensitive areas will be required to justify locating development in moderately-high constrained areas.
HIGH CONSTRAINT - If development takes place in these areas, considerable effort (and most likely expense) will be required to design out, mitigate or manage negative environmental impacts. In many cases this will not be possible and in general no development should take place in these areas. Only facilities that are location dependent should be permitted in these areas. For example, a road crossing a sensitive riparian area, or a mine pit that must be located where the resources are.
NO-GO CONSTRAINT – areas included areas of high sensitivity indicated by the bird and bat specialists (specific to turbines, rather than roads), identified heritage sites and buffers around existing infrastructure (including a 500m buffer around all noise sensitive areas).

The proposed Taaibos South WEF has avoided all **NO-GO** areas identified by the various specialists. Figure 10-1 overlays all sensitive areas identified by these specialists. The following sensitivities are relevant to the proposed WEF site:

- All specialist constraints (including **NO-GO**, **HIGH**, **MODERATE-HIGH**, **LOW-MODERATE** and **LOW/NONE**
- Northern Cape CBA:
  - CBA 1 **HIGH**
  - CBA 2 **MODERATE-HIGH**
  - ESAs **LOW-MODERATE**
- Updated SAPAD (Q1, 2021)
  - Protected Areas **NO-GO**
- NBA (2018) Threatened Ecosystems:
  - Critical **NO-GO**
  - Endangered **HIGH**
  - Vulnerable **MODERATE-HIGH**
- NPAES (2011)
  - Focus Areas **MODERATE-HIGH**
- NBA (2018) and NFEPA (2011/14) Wetlands **HIGH**
  - Wetlands 500m buffer **MODERATE**
- Rivers and drainage lines **HIGH**
  - River 100m Buffer **MODERATE**

The following table illustrate the placement of turbines within sensitive areas based on the current layout, this table also includes the current proposed turbine coordinates. All proposed turbines for the Taaibos South WEF are situated within LOW/NO IDENTIFIED SENSITIVITY areas.

Table 10-1: Turbine Sensitivities and Coordinates

TURBINE NUMBER	TURBINE SENSITIVITY	TURBINE COORDINATES	
		East	South
T01	LOW/NO IDENTIFIED SENSITIVITY	22.51733	-31.6686
T02	LOW/NO IDENTIFIED SENSITIVITY	22.50353	-31.6647
T03	LOW/NO IDENTIFIED SENSITIVITY	22.52247	-31.6623
T04	LOW/NO IDENTIFIED SENSITIVITY	22.52306	-31.6537
T05	LOW/NO IDENTIFIED SENSITIVITY	22.51187	-31.6563
T06	LOW/NO IDENTIFIED SENSITIVITY	22.48375	-31.6552
T07	LOW/NO IDENTIFIED SENSITIVITY	22.46137	-31.6487
T08	LOW/NO IDENTIFIED SENSITIVITY	22.47432	-31.6427
T09	LOW/NO IDENTIFIED SENSITIVITY	22.49370	-31.6437
T10	LOW/NO IDENTIFIED SENSITIVITY	22.50405	-31.6404
T11	LOW/NO IDENTIFIED SENSITIVITY	22.52693	-31.6441
T12	LOW/NO IDENTIFIED SENSITIVITY	22.52426	-31.6354
T13	LOW/NO IDENTIFIED SENSITIVITY	22.55141	-31.6324
T14	LOW/NO IDENTIFIED SENSITIVITY	22.54055	-31.6266
T15	LOW/NO IDENTIFIED SENSITIVITY	22.53300	-31.6314
T16	LOW/NO IDENTIFIED SENSITIVITY	22.51325	-31.6366
T17	LOW/NO IDENTIFIED SENSITIVITY	22.50177	-31.6315
T18	LOW/NO IDENTIFIED SENSITIVITY	22.49255	-31.6347
T19	LOW/NO IDENTIFIED SENSITIVITY	22.47604	-31.6353
T20	LOW/NO IDENTIFIED SENSITIVITY	22.46847	-31.6251
T21	LOW/NO IDENTIFIED SENSITIVITY	22.47955	-31.625
T22	LOW/NO IDENTIFIED SENSITIVITY	22.49100	-31.6256

T23	LOW/NO IDENTIFIED SENSITIVITY	22.50109	-31.6205
T24	LOW/NO IDENTIFIED SENSITIVITY	22.48213	-31.6156
T25	LOW/NO IDENTIFIED SENSITIVITY	22.50078	-31.6563
T26	LOW/NO IDENTIFIED SENSITIVITY	22.48831	-31.6100
T27	LOW/NO IDENTIFIED SENSITIVITY	22.51048	-31.6067
T28	LOW/NO IDENTIFIED SENSITIVITY	22.51287	-31.6154
T29	LOW/NO IDENTIFIED SENSITIVITY	22.52205	-31.6111
T30	LOW/NO IDENTIFIED SENSITIVITY	22.53311	-31.6164
T31	LOW/NO IDENTIFIED SENSITIVITY	22.51636	-31.6456
T32	LOW/NO IDENTIFIED SENSITIVITY	22.48555	-31.6477
T33	LOW/NO IDENTIFIED SENSITIVITY	22.53772	-31.6422
T34	LOW/NO IDENTIFIED SENSITIVITY	22.49129	-31.6632
T35	LOW/NO IDENTIFIED SENSITIVITY	22.50023	-31.6122
T36	LOW/NO IDENTIFIED SENSITIVITY	22.54536	-31.6380
SUMMARY	TURBINE SENSITIVITY		
NO-GO			
HIGH SENSITIVITY			
HIGH/MODERATE SENSITIVITY			
MODERATE SENSITIVITY			
LOW/MODERATE SENSITIVITY			
LOW/NO IDENTIFIED SENSITIVITY	36		

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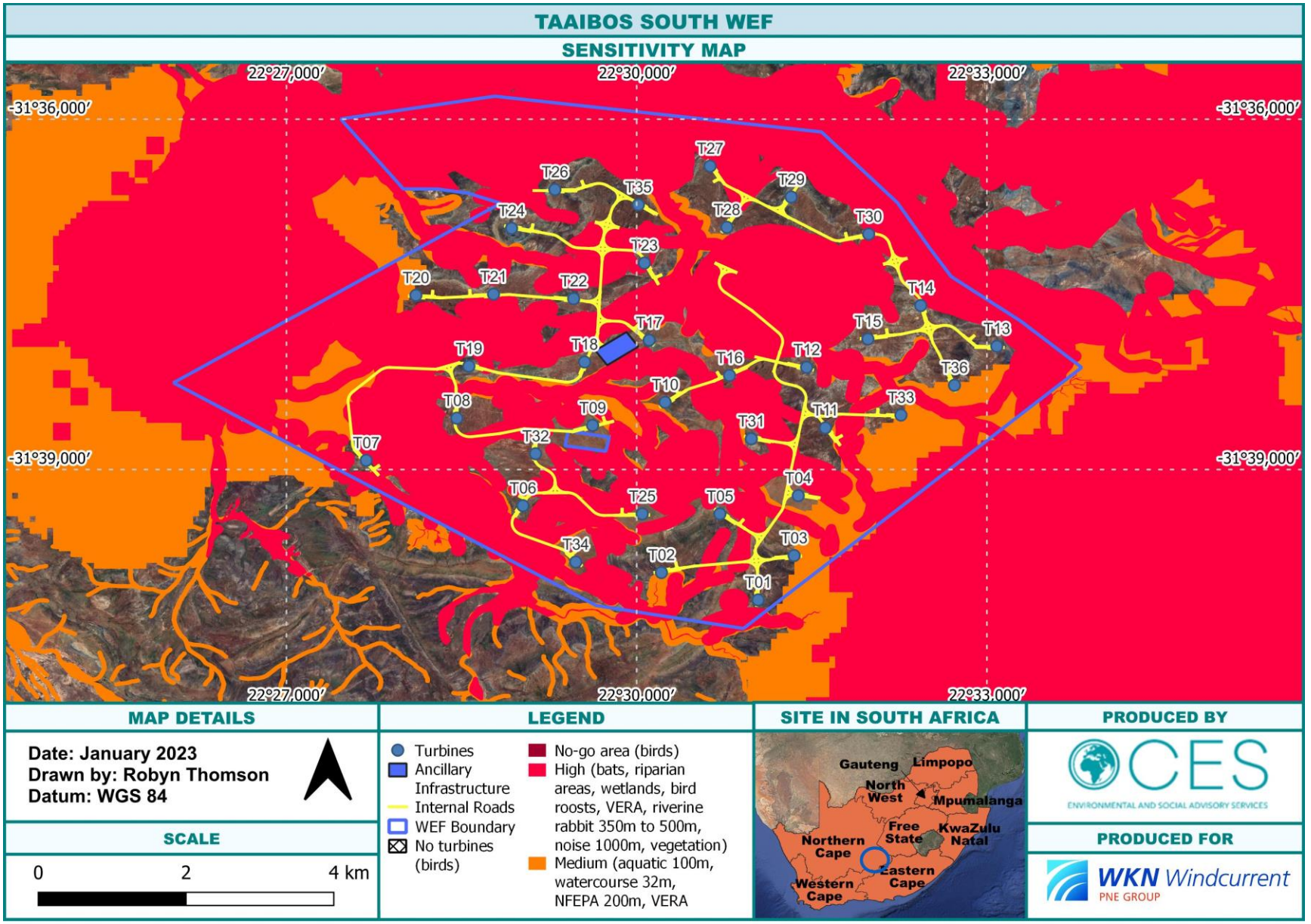

Figure 10-1: Taaibos South WEF Site Sensitivity

11 PUBLIC PARTICIPATION

11.1 NOTIFICATION OF INTERESTED AND AFFECTED PARTIES

Public consultation is a legal requirement throughout the EIA process. Developers are required to conduct public consultation throughout the Scoping and EIR phase. Formal EIA documents are required to be made available for public review and comment by the proponent, these include the Project Brief, Scoping Report and Terms of Reference for the EIA, the draft and final EIA reports and the decision of the Competent Authority (DEA). The method of public consultation to be used depends largely on the location of the development and the level of education of those being impacted on by the project. Required means of public consultation include:

- Site notice(s);
- Newspaper advertisement(s);
- Letter of Notification and information to affected landowner(s), stakeholders and registered I&APs;
- Background Information Document (BID) distribution;
- Public meeting (Attendance register and meeting minutes); and
- Authority and Stakeholder engagement (DFFE, DWS, SAHRA, DMRE, etc.).

Please note that all proof of public notification has been attached as APPENDIX C.

11.1.1 NEWSPAPER ADVERTISEMENT

- Scoping Phase: Volksblad, 29th of July 2022, please see APPENDIX C.
- EIA Phase: Volksblad, January 2023, proof to be added to APPENDIX C.

11.1.2 ONSITE NOTICES

- An onsite notice board has been erected: See APPENDIX C.

11.1.3 INTERESTED AND AFFECTED PARTIES (I&APS) IDENTIFICATION AND NOTIFICATION

In addition to the above notification, certain I&APs were identified based on their potential interest in the project. In Table 10-1, all relevant organisations will be invited to comment on the reports as and when available. This list is considered a live document and names will be added and/removed based on the consultation process. Proof of correspondence has been added to APPENDIX C.

PLEASE NOTE THAT DUE TO THE POPIA ACT, AND THE LIST BEING POPULATED BY THE EAP, ONLY FARM NAMES AND STAKEHOLDER NAMES ARE VISIBLE, NO PERSONAL INFORMATION WILL BE SHARED UNTIL CORRESPONDENCE HAS BEEN CIRULATED DURING PPP.

Table 11-1: Stakeholder and Organisational Database

Stakeholders
Department of Forestry, Fisheries and the Environment (DFFE)
Department of Forestry, Fisheries and the Environment (DFFE): Biodiversity & Conservation
Department of Nature Conservation and Environmental Affairs (Northern Cape)
Department of Water & Sanitation DWS (Northern Cape)
Department of Mineral Resources (DMR)
Northern Cape Tourism

Department of Energy
Eskom
Eskom: Renewable Energy
Pixley Ka Seme District Municipality: Environmental Officer
Ubuntu Local Municipality: Acting Municipal Manager
Ubuntu LM Ward 5 Councillor
Ubuntu LM Ward 6 Councillor
SALGA Northern Cape
South African Heritage Resources Agency (SAHRA)
Telkom
Sentech
Vodacom
MTN
Cell C
Civil Aviation Authority (CAA)
Air Traffic and Navigation Services (ATNS)
Roads (SANRAL/Public Works)
BirdLife South Africa
BirdLife South Africa: Birds and Renewable Energy Manager
BirdLife South Africa: Policy & Advocacy Manager
Endangered Wildlife Trust: CEO
Endangered Wildlife Trust: EIA
Endangered Wildlife Trust: Head of Conservation Science
Endangered Wildlife Trust: Wildlife & Energy Programme
WEF LANDOWNERS
RE/261
RE/250
RE/209
RE/208
RE/199
RE/199
RE/197
RE/196
RE/195
RE/148
RE/147
RE/145
6/158
4/158
4/145
3/200
3/158
2/212
2/208
2/200
2/199
1/250

1/211
1/201
1/200
1/197
GRID CONNECTION LANDOWNERS
RE/3
RE/265
RE/265
RE/249
RE/248
RE/232
RE/231
RE/229
RE/228
RE/222
RE/220
RE/213
RE/2
RE/199
RE/197
RE/195
RE/1
7/222
7/220
5/222
4/222
3/248
3/158
2/212
10/248
1/265
1/222
1/221
1/219
1/211
1/200
SURROUNDING LANDOWNERS
RE/8
RE/6
RE/273
RE/269
RE/262
RE/249
RE/213
RE/212
RE/205
RE/194

RE/158
RE/152
RE/148
RE/147
7/151
6/151
5/207
4/208
4/207
4/158
4/151
3/212
3/205
3/200
3/145
3/134
2/212
2/211
2/208
2/205
2/204
2/200
1/208
1/207
1/200
1/153
REGISTERED INTERESTED AND AFFECTED PARTIES
To be added as requests are received

11.1.4 SURROUNDING AND AFFECTED LANDOWNERS

The residents of the surrounding areas were provided with an initial letter of introduction to the project during the site meetings. These documents included the contact details of the EAP for the landowners to register themselves and/or submit their comments on the proposed development.

11.1.5 REGISTERED I&APS

Other than I&APs initially identified and any persons requesting to be registered as I&APs have been and will continue to be included in the I&AP database (Table 10-1).

11.1.6 THE PUBLIC PARTICIPATION PROCESS FOLLOWED AND TO BE FOLLOWED INCLUDES:

Release of the Draft Scoping Report for Authority, Stakeholder and Public review.

The Draft Scoping Report was made available for public review from the 29th of July 2022 to 10th of September 2022 (30 days, inclusive of one public holiday).

(a) Hard copies of the Draft Scoping Report were made available at:
- Loxton Library, Margaretha Prinsloo St, Loxton
- Victoria West Library, 5 Queen Victoria Street, Victoria West

(b) Soft copies were made available on the CES website (www.cesnet.co.za)

Release of the Draft Environmental Impact Assessment Report for Authority, Stakeholder and Public review

The Draft EIR will be made available for public review from the 24th of January until the 23rd of February 2023 (30 days)

(a) Hard copies of the Draft Environmental Impact Assessment Report will be available at:
- Loxton Library, Margaretha Prinsloo St, Loxton
- Victoria West Library, 5 Queen Victoria Street, Victoria West

(b) Electronic copies will be made available on the CES website (www.cesnet.co.za)

11.2 COMMENTS AND RESPONSE REPORT

The comments and response report will be a live and continuously updated report which details all comments received and the responses there to. This report has been included as Appendix D of the Final Scoping Report.

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12 CONCLUSIONS AND RECOMMENDATIONS

12.1 CONCLUSION

Taaibos South Wind Energy Facility RF (Pty) Ltd., plans to develop, construct and operate a Wind Energy Facility (WEF) between the towns of Victoria West and Loxton in Ubuntu Municipality in the Northern Cape Province. The project site is situated in within the greater Pixley Ka Seme District Municipality. According to the data in the area, this project site appears to have favourable wind conditions to operate a wind farm.

The proposed Taaibos South Wind Energy Facility (WEF) will consist of up to 36 turbines, with a total facility output of up to 270MW. The WEF will also include a powerline and switching station in order to connect the WEF to the existing Eskom Substation (this will be applied for in a separate environmental application). The WEF will also include a Battery Energy Storage System (BESS), temporary and permanent laydown areas, an IPP Substation (SS), a Concrete Tower Manufacturing Facility (CTMF), access roads and a construction compound (CC) area. The construction footprint of the proposed WEF will be up to 139ha (inclusive of roads), rehabilitated to an operational footprint of up to 85ha (inclusive of roads).

The nature of the proposed site for the establishment of the WEF is suitably-placed on land currently used for livestock grazing. However, the establishment of the proposed Taaibos South WEF raises various issues pertaining to:

- Visual intrusion on the landscape.
- Noise impacts on surrounding land inhabitants.
- Ecological sensitivity (flora and fauna, particularly riverine rabbits).
- Avifaunal and bat sensitivity.
- Heritage sites and resources.
- Paleontological sites in terms of potential fossil deposits.
- Socio-economic impacts and benefits.

12.2 NEED AND DESIRABILITY

The need to reduce greenhouse gas emissions and the importance of a secure and diversified energy supply has resulted in a national shift towards the use of renewable energy technologies. In support of this, the national and provincial government has encouraged the utilisation of renewable energy through policy and strategic planning.

12.3 ASSUMPTIONS, LIMITATIONS AND GAPS IN KNOWLEDGE

This report is based on currently available information and, as a result, the following limitations and assumptions are implicit–

- This report is based on a project description and site plan, provided to CES by the applicant, which has not been approved by DFFE at this stage of the project. The project description and site plan may undergo iterations and refinements before being regarded as final. A project description based on the final design will be concluded once DFFE has provided feedback on the layout provided in this report.
- Descriptions of the natural and social environments are based on limited fieldwork and available literature.

- It should be emphasised that information, as presented in this document, only has reference to the study area as indicated on the accompanying maps. Therefore, this information cannot be applied to any other area without a detailed investigation being undertaken.

12.4 Environmental Cost-Benefit Analysis

241 impacts were identified during the EIA process. Of the identified impacts 213 are NEGATIVE and 28 are POSITIVE pre- and post-mitigation. The purpose of the EIA process is to ensure that a site and proposed activity are assessed and then mitigated in terms of the mitigation hierarchy.

In terms of the mitigation hierarchy the Figures below illustrate the following application.

1) Avoid: Sensitive areas have been avoided as per Chapter 10 of this report (sensitivity analysis) and no critical un-mitigatable impacts remain. No turbines are situated within areas rated above LOW sensitivity.
2) Minimise: Most of the impacts are LOW post-mitigation (71%), having been reduced from predominantly MODERATE pre-mitigation.
3) Offset: N/A as no VERY HIGH biodiversity impacts remain post mitigation.

Given the reduction in impact significance (negative impacts) through the mitigation hierarchy and the number of positive impacts associated with the development, the EAP is of the opinion that the environmental, social and economic cost does not outweigh the environmental, social and economic benefit of the proposed Taaibos South WEF.

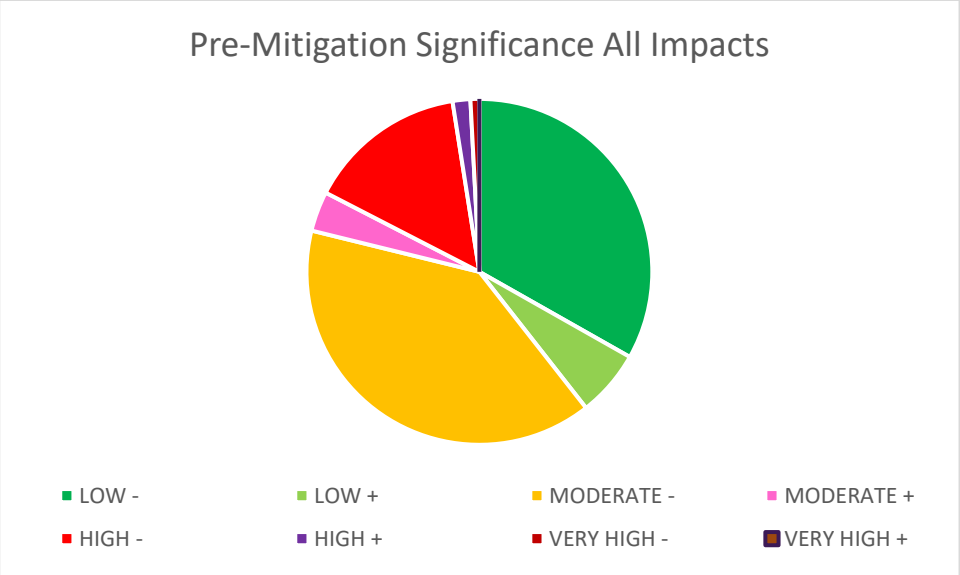

Figure 122-1: Taaibos South WEF Full Impact Comparison, Pre-Mitigation

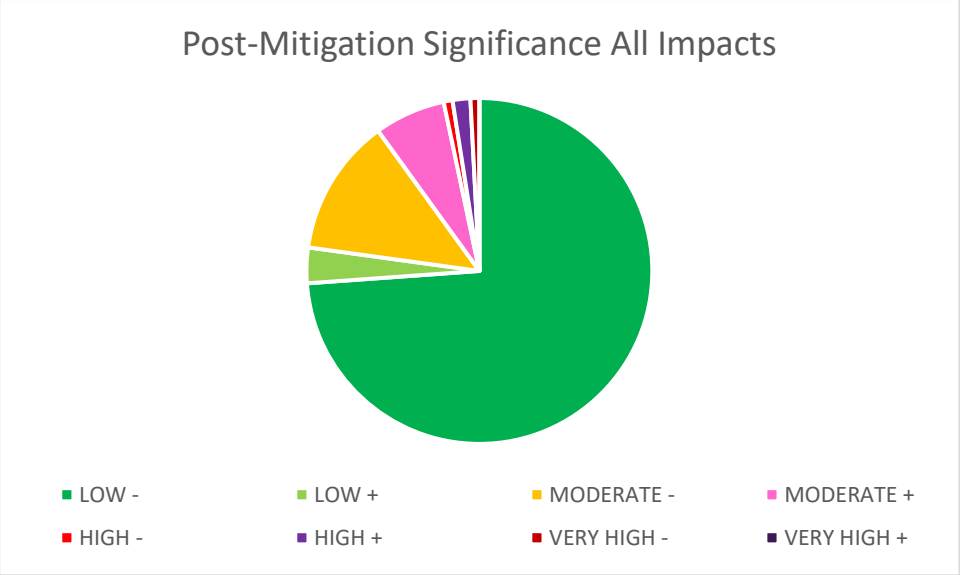

Figure 122-2: Taaibos South WEF Full Impact Comparison, Post-Mitigation

12.5 Fatal Flaws

It is the opinion of the EAP that based on the information gathered during the course of the EIA process, including specialist studies and PPP, the impacts described do not represent any fatal flaws regarding the proposed Taaibos South WEF.

12.6 Opinion of the EAP

Based on the contents of this report, and all associated documentation, it is the opinion of the EAP that the proposed Taaibos South WEF be authorised on condition that all conditions stipulated in Section 12.7 of this report be contained within the EA. The ecological, economic and social trade-offs must be factored in by the department during the decision-making process. It is the opinion of the EAP that site is sensitive from a visual perspective (social), suitable from an ecological perspective (high sensitive areas have been avoided and can be suitably mitigated) and both sensitive and suitable from an economic perspective.

12.7 Recommendations of the EAP

Please note that this this list is limited to general recommendations. The specialist recommendations have been included in the EMPr, which must be implemented and adhered to.

12.7.1 Planning and Design Recommendations

The following mitigation measures must be implemented as part of the planning and design phase:

- Project planning must include a plan for traffic control that will be implemented, especially during the construction phase of the development. Consultation with the local Road Traffic Unit in this regard must be done early in the planning phase. The necessary road traffic permits must be obtained for transporting parts, containers, materials and construction equipment to the site.
- Careful planning of the routes taken by heavy vehicles must highlight areas of road that may need to be upgraded in order to accommodate these vehicles. Once identified, these areas must be upgraded if necessary.

- All hazardous substances such as paints, diesel and cement must be stored in a bunded area with an impermeable surface beneath them.
- Cement mixing must be conducted at a single location which must be centrally located, where practical. This mixing must take place on an impermeable surface, and dried waste cement must be disposed of with building rubble.
- The applicant must ensure that all relevant legislation and policy is consulted and further ensure that the project is compliant with such legislation and policy. These must include (but not restricted to):
  - Local and District Spatial Development Frameworks
  - Local Municipal bylaws
- In addition, planning for the construction and operation of the proposed energy facility must consider available best practice guidelines, up to date at the proposed time of construction.
- Structures must be located at least 32m away from identified drainage lines.
- A Stormwater Management Plan must be designed and implemented to ensure maximum water seepage at the source of water flow.
- The Stormwater Management Plan must also include management mitigation measures for water pollution, wastewater management and the management of surface erosion e.g. by considering the applicability of contouring, etc.
- A Waste Management Plan must be developed for handling onsite waste. This plan must designate an appropriate area where waste can be stored before disposal.
- All general waste must be disposed of at a registered landfill site.
- Wherever possible, construction activities must be undertaken during the driest part of the year to minimize downstream sedimentation due to excavation, etc. When not possible, suitable stream diversions structures must be used to ensure that rivers/streams are not negatively impacted by construction activity.

12.7.2 CONSTRUCTION RECOMMENDATIONS

The following mitigation measures must be implemented during the construction phase:

- Fugitive/nuisance dust must be reduced by implementing one of or a combination of the following
  - Damping down of un-surfaced and un-vegetated areas;
  - Retention of vegetation where possible;
  - Excavations and other clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas;
  - A speed limit of 40km/h must not be exceeded on dirt roads;
- Any complaints or claims emanating from the lack of dust control must be attended to immediately by the Contractor.
- There must be no burning of construction waste or debris onsite. Cooking is not permitted on site. Smoking on site must be confined to a designated area in the vicinity of the site office which must be equipped with the necessary fire extinguishers.
- The Stormwater Management Plan must be implemented. There must be no earthworks within 32m of the drainage lines to avoid contamination of water sources.
- The Waste Management Plan, incorporating recycling and waste minimisation, must be implemented. The plan must be explained to all employees as part of the environmental induction training. All waste must be disposed of at an appropriately licensed landfill site.
- The storage of fuels and hazardous materials must be located away from sensitive water resources. All hazardous substances (e.g. diesel, oil drums, etc.) must be stored in a bunded area.
- All construction materials must be stored in a central and secure location with controlled access with an appropriate impermeable surface.
- The recommendations of the Stormwater Management Plan must be implemented to mitigate the impacts of run-off water on pollution.
- The concrete batching plant must be clearly demarcated, and no sprawl must be tolerated.

- Stockpiled excavated material must not be stored within 32m of a watercourse.
- Stockpile areas must be suitably bunded to prevent waterborne erosion of exposed soils where there is a likelihood that the soils will be washed into a watercourse.
- Materials used for infilling must be suitably stabilized to ensure that scour and erosion of the existing bed/banks is exacerbated.
- Subsoil cannot be disposed of onsite without the appropriate Waste License in terms of the NEMA: Waste Act. This must be stipulated in the Waste Management Plan.
- Spoil could be used to rehabilitate open borrow pits or erosion features. Disposal of spoil material to a registered landfill must be the last option. No spoil stockpiles will be allowed to remain onsite once construction activities have ceased.

12.7.3 OPERATIONAL RECOMMENDATIONS

The following mitigation measures must be implemented during the operational phase:

- All project structures and buildings must be maintained.
- All hazardous substances must be stored in appropriately bunded locations.
- Recommendations of the Stormwater Management Plan must be implemented throughout the lifespan of the project.
- Recommendation of the Waste Management Plan, incorporating recycling and waste minimisation, must be implemented throughout the lifespan of the project.

12.7.4 DECOMMISSIONING RECOMMENDATIONS

The following mitigation measures must be implemented during the operational phase:

- This section of mitigation measures must be reassessed by a suitably qualified EAP and specialists prior to decommissioning.
- Littering must be avoided, and litter bins must be made available at various strategic points on site. Refuse from the construction site must be collected on a regular basis and deposited at an appropriate landfill.
- Fugitive/nuisance dust must be reduced by implementing one of or a combination of the following
  - Damping down of un-surfaced and un-vegetated areas;
  - Retention of vegetation where possible;
  - Excavations and other clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas;
  - A speed limit of 40km/h must not be exceeded on dirt roads;
- Any complaints or claims emanating from the lack of dust control must be attended to immediately by the Contractor.
- Construction vehicles and machinery must make use of existing infrastructure such as roads as far as possible to minimise disturbance on the receiving environment.
- After the removal of all wind turbine-related structures, the disturbed soils must be re-vegetated to avoid unnecessary soil erosion.

Based on current available information the turbines will be removed as per the above specifications. It is recommended that a new and up-to-date impact assessment is undertaken prior to this process to ensure that the latest relevant guidelines and policy on wind farm decommissioning are factored into the process. Should new technology be available to replace the structures then, depending on the legislation relevant at the time, the EAP recommends a new impact assessment process prior to being able to do so. The DFFE would be required to approve any decommissioning or replacement process.

12.7.5 MONITORING RECOMMENDATIONS

- Avifaunal Monitoring:
  - The duration and scope of post-construction monitoring must be informed by the outcomes of the previous year's monitoring and must be reviewed annually. Post-construction monitoring of bird abundance and movements should span a minimum of one year and monitoring for fatalities should take place over a minimum of two to three years and repeated at year five and every five years thereafter. The duration of monitoring must be increased should significant impacts be observed.
  - A contingency mitigation budget must be planned for in the operational phase to allow adaptive management of impacts that arise. If such a situation arises possible necessary mitigation measures could include: further research into the problem (including possibly bird tracking studies); human based turbine shutdown on demand; habitat alteration; bird deterrence from site; and any others identified as feasible at the time.
- Bat Monitoring
  - Post-construction/ operational bat monitoring must be performed according to the South African Good Practise Guidelines for Operational Monitoring for Bats at Wind Energy Facilities (Aronson et al 2014) or later version valid at the time of monitoring. IWS recommends the initial 2 years and then every third year for the remainder of the project.
  - Should operational monitoring show that adjusted annual bat fatalities (adjusted for biases such as searcher efficiency and carcass persistence) ever equal or exceed the threshold level of fatalities guided by SABAAP then mitigation actions will only be required at specific turbines that have killed 2 or more bats of the particular bat species that has exceeded the fatality threshold for the previous year of monitoring.
  - Such actions at the individual turbines include increasing the cut-in wind speed to 6m/s (only exposing 40% of bat activity to spinning blades).
  - When dealing with living animals that can respond in different and unpredictable ways to changing environmental, climatic and developmental parameters, it is very difficult to make guaranteed predictions. Lintott et al. (2016) state that the nightly and seasonal activity data collected during pre-construction surveys may provide an indication of the extent of curtailment that is required and therefore the economic viability of the project, however, they highlight the need for a feedback mechanism for practitioners to share the success or failure of mitigation strategies, i.e. adaptive mitigation. The bat specialist conducting the operational monitoring has the right to make further recommendations should they see fit.
  - Given the magnitude and extent of wind-turbine related bat fatalities worldwide, the conservation implications are critically important and bat fatalities must be avoided, minimised or mitigated proactively.

13 APPENDIX A | EAP DECLARATION

PLEASE FIND SIGNED EAP DECLARATION HERE WITHIN

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14 APPENDIX B | EAP CVs

PLEASE FIND EAP TEAM CVs HERE WITHIN

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15 APPENDIX C | PPP PROOFS

15.1 PROOF OF ADVERTISEMENT


Vrydag 29 Julie 2022 Volksblad
Nuus 13
PRINS WILLIAM, MINISTER BRING HULDE
Veldwagter se vrou nog kritiek
Man is glo voorheen met dood gedreig
Anton het sy lewe gewy aan bewaring en het die verhoudings tussen bewaringsgroepe en owerhede bevorder.
210 vetplante nou op rooidatalys
nre auctioneers
LIKWIDASIE VEILING
WOENSDAG 10 AUGUSTUS'22
11H00 OP MERIBA, SOUTPAN
Jorrie 082 575 1732
www.nreauctioneers.co.za
www.volksblad.com
OM TE ADVERTEER SKAKEL
Geklassifiseerd
KENNISGEWINGS
CES
Volksblad
REGSKENNISGEWINGS
VOLKSBLAD GEKLASSIFISEERDE ADVERTENSIES

Volksblad Vrydag 29 Julie 2022

CES

KENNISGEWING VAN AANSOEK VIR OMGEWINGS MAGTIGING VIR DIE TAAIBOS SUID WINDENERGIE FASILITEIT (WEF), UBUNTU PLAASLIKE MUNISIPALITEIT, NOORD KAAP PROVINSIE

Kennis geskied hiermee ingevolge Regulasie 41(2) gepubliseer in Staatskennisgewing No. 982 kragtens Hoofstuk 6 van die Nasionale Omgewingsbestuurswet (WNOB) (Wet No. 107 van 1998, soos gewysig) Omgewingsimpakstudie (OIB) Regulasies (2014, soos gewysig) van die voorneme om 'n Aansoek om Omgewingsmagtiging (OM) in te dien vir die voorgestelde ontwikkeling van die Taaibos Suid Suid Windenergiefasiliteit (WEF) binne die Ubuntu Plaaslike Munisipaliteit van die Noord-Kaap Provinsie. Die aktiwiteit sal op die volgende plaasgedeeltes plaasvind: Plaas 145, Gedeelte 4; Plaas 250; Oorblewende gedeelte (OG); en Plaas 250, Gedeelte 1.

Die voorgestelde Taaibos Suid Windenergiefasiliteit (WEF) sal uit tot 36 turbines bestaan, met 'n totale fasiliteitsuitset van tot 270MW. Die WEF sal ook 'n kraglyn en skakelstasie insluit om die WEF aan die bestaande Eskom Substasie te koppel (daaroor sal in 'n aparte omgewingsaansoek aansoek gedoen word). Die WEF sal ook 'n battery-energie-bergingstelsel (BEBS), tydelike en permanente lêgebiede, 'n Onafhanklike Krag Produsent-substasie, 'n betontoring-vervaardigingsfasiliteit (BTVF), toegangspaaie en 'n konstruksieverbinding (KV)-area insluit. Die konstruksie-voetspoor van die voorgestelde WEF sal tot 139ha (paaie ingesluit), gerehabiliteer tot 'n operasionele voetspoor van tot 85ha (insluitend paaie).

Die ontwikkeling van die voorgestelde Taaibos Suid WEF aktiveer NEMA (Wet No. 107 van 1998, soos gewysig) OIB-regulasies (2014, soos gewysig) Noteringskennisgewing 1, 2 en 3 aktiwiteite, insluitend Noteringskennisgewing 2 Aktiwiteit 1 vir die ontwikkeling van fasiliteite of infrastruktuur vir die opwekking van grootskaalse hernubare energie; en vereis dus 'n Omvangbepaling en OIB-proses. Coastal and Environmental Services (Edms) Bpk., wat handel dryf as "CES", is aangestel om die vereiste Bestekopname en OIB-proses te onderneem. Die bevoegde owerheid vir hierdie aansoek om Omgewings Magtiging (OM) is die nasionale departement van bosbou, visserye en die omgewing (DBVO).

Vir verdere informasie, registrasie as 'n Belanghebbende en/of Geaffekteerde Party (B&AP) of indiening van skriftelike kommentaar, kontak asseblief vir Me Caroline Evans via pos, telefoon of epos: Posbus 934, Makhanda (Grahamstad), 6140 | Tel: +27 (0)46 622 2364 | Epos: reppp@cesnet.co.za
* Sluit asseblief die projek verwysing in by alle korrespondensie: ***Taaibos Suid WEF.***

KENNISGEWING: POPIA ("Protection of Personal Information Act" – Beskerming van Persoonlike Informasie Wet) Vrywaring. Alle Belanghebbende- en B&GP-databasisse moet vanaf 1 Julie 2021 aan die Wet voldoen. Indien u as 'n B&GP op die Belanghebbende- en B&GP-databasis wil registreer, benodig ons as die administrateurs van die Taaibos Suid WEF Belanghebbende en B&GP-databasis u toestemming om deel te wees van hierdie databasis. As sodanig word u hiermee in kennis gestel dat u geregtig is om sodanige toestemming te weier en u kan so 'n reg uitoefen deur in enige stadium van die proses skriftelik van hierdie databasis te onttrek. Sou u kies om in hierdie groep aan te bly, sal dit aanvaar word dat u ingestem het om deel te wees van hierdie databasis en dat u persoonlike inligting (synde jou naam, affiliasie, kontakbesonderhede en skriftelike kommentaar) sigbaar is vir enige persoon wat in die projek belang stel sowel as in die publieke domein. In hierdie verband doen ons 'n beroep op alle lede van hierdie databasis om NIE van sodanige persoonlike inligting gebruik te maak vir watter rede ook al sonder om die toestemming van die betrokke persoon(e) te verkry nie.

15.2 PROOF OF SIGNAGE

Signage has been erected on the western access road to the site. Please see proof below.


CES
NOTICE OF APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE TAAIBOS SOUTH WIND ENERGY FACILITY (WEF), UBUNTU LOCAL MUNICIPALITY, NORTHERN CAPE PROVINCE
Notice is hereby given in terms of Regulation 41(2) published in Government Notice No. 982 under Chapter 6 of the National Environmental Management Act (NEMA) (Act No. 107 of 1998, as amended) Environmental Impact Assessment (EIA) Regulations (2014, as amended) of the intention to submit an Application for Environmental Authorisation (EA) for the proposed development of the Taaibos South Wind Energy Facility (WEF) within the Ubuntu Local Municipality of the Northern Cape Province. The activity will take place on the following farm portions: Farm 145, Portion 4; Farm 250; Remaining Extent (RE); and Farm 250, Portion 1.
The proposed Taaibos South Wind Energy Facility (WEF) will consist of up to 38 turbines, with a total facility output of up to 270MW. The WEF will also include a powerline and switching station in order to connect the WEF to the existing Eskom Substation (this will be applied for in a separate environmental application). The WEF will also include a Battery Energy Storage System (BESS), temporary and permanent laydown areas, an IPP Substation (SS), a Concrete Tower Manufacturing Facility (CTMF), access roads and a construction compound (CC) area. The construction footprint of the proposed WEF will be up to 125ha (inclusive of roads), rehabilitated to an operational footprint of up to 77ha (inclusive of roads).
The development of the proposed Taaibos South WEF triggers NEMA (Act No. 107 of 1998, as amended) EIA Regulations (2014, as amended) Listing Notice 1, 2 and 3 activities, including Listing Notice 2 Activity 1 for the development of facilities or infrastructure for the generation of large-scale renewable energy; and therefore requires a Scoping and EIA Process. Coastal and Environmental Services (Pty) Ltd, trading as "CES", have been appointed to undertake the required Scoping and EIA Process. The Competent Authority for this Application for EA is the national Department of Forestry, Fisheries and the Environment (DFFE).
For more information, registration as an Interested and/or Affected Party (I&AP) or submission of written comments, please contact
Ms Caroline Evans via post, phone or email: P.O. Box 934, Makhanda (Grahamstown), 6140 | Tel: +27 (0)46 622 2364 | Email: wepp@cesnet.co.za
* Please include the project reference in all correspondence: Taaibos South WEF
21/07/2022 14:26


21/07/2022 14:25

15.3 PROOF OF DOCUMENT DISTRIBUTION

Caroline Evans

From:	Caroline Evans
Sent:	Friday, 29 July 2022 16:46
To:	Alan Carter
Cc:	reppp@cesnet.co.za
Subject:	NOTIFICATION | Taaibos South WEF | Draft Scoping Report PPP, 29/07/2022 - 29/08/2022
Bcc:	vdbsc@mweb.co.za; peteandbevwilliams@outlook.com; MotsisL@eskom.co.za; pietsch@mweb.co.za; brett@wilbrink.co.za; hugofin@absamail.co.za; jdpotgieter@vodamail.co.za; jdpotgieter@vodamail.co.za; jsch@telkomsa.net; hfhugo@yahoo.com; moediehiventer@hotmail.com; davidlrx@gmail.com; dawidlrx@gmail.com; francois@nustatecp.com; hfhugo@yahoo.com; murrayhugo@yahoo.com; vermeulen.charl@gmail.com; vermeulen.charl@gmail.com; walter.andrag@agrico.co.za; vaalbult@lando.co.za; wollie04@gmail.com; perdjielubbe@gmail.com; janwiese@mweb.co.za; adminjfvanwyk@webafrica.org.za; moediehiventer@hotmail.com; SHANATRIEG@GMAIL.COM; wollie04@gmail.com; stoeifontein@gmail.com; chris.devlei@gmail.com; info@meltonwold.co.za; rick@westwoods.co.za; taaiboschfonteinguestlodge@gmail.com; agt.schoevers@gmail.com; francois@nustatecp.com; andre@nustatecp.com; bookings@kraalbaailhb.com; JMPELANE@dffe.gov.za; BCAdmin@environment.gov.za; smunzhedzi@environment.gov.za; smalete@environment.gov.za; dmartin@ncpg.gov.za; tmakaudi@ncpg.gov.za; bfisher@ncpg.gov.za; d.moleko@ncpg.gov.za; loctober@ncpg.gov.za; lfarmer@ncpg.gov.za; adaniels@ncpg.gov.za; atawana@ncpg.gov.za; abrahamsa@dws.gov.za; fenin2 @dws.gov.za; mokhoantlel@dws.gov.za; kgapholam@dws.gov.za; hlengania@dws.gov.za; VanDykG@dws.gov.za; CloeteS@dws.gov.za; NgidiZ@dws.gov.za; MoalosiK2@dws.gov.za; MoalosiK2@dws.gov.za; Sunday.mabaso@mr.go.za; nwabisa.qwanyashe@dmr.gov.za; thokob@daff.gov.za; MashuduMa@daff.gov.za; mokgadi.mathekgana@energy.gov.za; eddie.leach@eskom.co.za; GeerinJH@eskom.co.za; otshekela@pksdm.gov.za; nmontwana@gmail.com; nmkontwana@ubuntu.gov.za; mmaloi@gmail.com; mzeekoei@gmail.com; ithatelo@salga.org.za; fortunec@ncpg.gov.za; gmothibi@ncpg.gov.za; vmothibi@ncpg.gov.za; info@sahra.org.za; nhiggitt@sahra.org.za; CouchRA@telkom.co.za; viljoena@sentech.co.za; andre.barnard@vodacom.co.za; krishna.chetty@mtn.com; hdippenaar@cellc.co.za; RLiebenberg@cellc.co.za; wvermaak@cellc.co.za; DVanDerWalt@cellc.co.za; StrohL@caa.co.za; camu@atns.co.za; GouwsJ@nra.co.za; daniel.marnewick@birdlife.org.za; hanneline.smit-robinson@birdlife.org.za; energy@birdlife.org.za; advocacy@birdlife.org.za; yolanf@ewt.co.za; eia@ewt.org.za; harrietd@ewt.org.za; lourensl@ewt.org.za

Dear Taaibos South WEF Stakeholders and I&APs

Kindly note that a new application has been lodged for the Taaibos South WEF, proposed between Loxton and Victoria West in the Ubuntu Local Municipality of the Northern Cape Province.

The proposed Taaibos South Wind Energy Facility (WEF) will consist of up to 36 turbines, with a total facility output of up to 270MW. The WEF will also include a powerline and switching station in order to connect the WEF to the existing Eskom Substation (this will be applied for in a separate environmental application). The WEF will also include a Battery

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Energy Storage System (BESS), temporary and permanent laydown areas, an IPP Substation (SS), a Concrete Tower Manufacturing Facility (CTMF), access roads and a construction compound (CC) area. The construction footprint of the proposed WEF will be up to 139ha (inclusive of roads), rehabilitated to an operational footprint of up to 85ha (inclusive of roads).

The Draft Scoping Report is available for public review from the 29th of July until the 29th of August 2022. The documentation can be accessed at:

- *Soft Copy*: CES website at http://www.cesnet.co.za/public-documents
- *Hard Copy 1*: Loxton Public Library, Margaretha Prinsloo Street, Loxton
- *Hard Copy 2*: Victoria West Public Library, 5 Queen Victoria Street, Victoria West

Please kindly address all comments as follows:
Email: reppp@cesnet.co.za
Attention: Caroline Evans
Subject Line: Taaibos South WEF

You are also hereby reminded of the following important information:
NOTICE: POPIA (Protection of Personal Information Act) Disclaimer. All Stakeholder and I&AP Databases need to adhere to the Act from the 1st of July 2021. Should you wish to register as an I&AP on the Stakeholder and I&AP Database, as the administrators of the Taaibos South WEF Stakeholder and I&AP Database we require your consent to be part of this database. As such you are herewith notified that you are entitled to refuse such consent and you may exercise such a right by withdrawing from this database in writing at any stage of the process. Should you elect to remain in this group, it will be accepted that you have consented to being a part of this database and to your personal information (being your name, affiliation, contact details and written comments) being noticeable to any person interested in this project and in the public domain. In this regard, we implore all members of this database NOT to make use of such personal information for whatsoever reason without obtaining the consent from the relevant person(s).

Please do not hesitate to contact me should you have any queries.

Kind regards
Caroline

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Caroline Evans

From:	Caroline Evans
Sent:	Tuesday, 30 August 2022 15:16
To:	TNethononda@environment.gov.za
Subject:	NOTIFICATION | Taaibos South WEF | Draft Scoping Report PPP, 29/07/2022 - 29/08/2022

Dear Taaibos South WEF Stakeholders and I&APs

DFFE Biodiversity and Conservation Directorate has made us aware of your Directorate and has requested that we notify you of this project. Kindly note that PPP ends on the 10th of September for the Draft Scoping Report. You have been registered on the Stakeholder and I&AP Database and will receive all notifications going forward

Kindly note that a new application has been lodged for the Taaibos South WEF, proposed between Loxton and Victoria West in the Ubuntu Local Municipality of the Northern Cape Province.

The proposed Taaibos South Wind Energy Facility (WEF) will consist of up to 36 turbines, with a total facility output of up to 270MW. The WEF will also include a powerline and switching station in order to connect the WEF to the existing Eskom Substation (this will be applied for in a separate environmental application). The WEF will also include a Battery Energy Storage System (BESS), temporary and permanent laydown areas, an IPP Substation (SS), a Concrete Tower Manufacturing Facility (CTMF), access roads and a construction compound (CC) area. The construction footprint of the proposed WEF will be up to 139ha (inclusive of roads), rehabilitated to an operational footprint of up to 85ha (inclusive of roads).

The Draft Scoping Report is available for public review from the 10th of August until the 10th of September 2022. The documentation can be accessed at:

- *Soft Copy*: CES website at http://www.cesnet.co.za/public-documents
- *Hard Copy 1*: Loxton Public Library, Margaretha Prinsloo Street, Loxton
- *Hard Copy 2*: Victoria West Public Library, 5 Queen Victoria Street, Victoria West

Please kindly address all comments as follows:
Email: reppp@cesnet.co.za
Attention: Caroline Evans
Subject Line: Taaibos South WEF

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NOTICE: POPIA (Protection of Personal Information Act) Disclaimer. All Stakeholder and I&AP Databases need to adhere to the Act from the 1st of July 2021. Should you wish to register as an I&AP on the Stakeholder and I&AP Database, as the administrators of the Taaibos South WEF Stakeholder and I&AP Database we require your consent to be part of this database. As such you are herewith notified that you are entitled to refuse such consent and you may exercise such a right by withdrawing from this database in writing at any stage of the process. Should you elect to remain in this group, it will be accepted that you have consented to being a part of this database and to your personal information (being your name, affiliation, contact details and written comments) being noticeable to any person interested in this project and in the public domain. In this regard, we implore all members of this database NOT to make use of such personal information for whatsoever reason without obtaining the consent from the relevant person(s).

Please do not hesitate to contact me should you have any queries.

Kind regards
Caroline

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Caroline Evans

From: Caroline Evans
Sent: Thursday, 22 September 2022 08:22
To: John Geeringh
Subject: RE: NOTIFICATION | Soutrivier Central WEF | Draft Scoping Report PPP, 29/07/2022 - 29/08/2022

Dear John

Thank you for your comments. I will be sharing the full infrastructure layout with you once it's available in more details (EIA phase). This will include:

- Taaibos North WEF
- Taaibos North WEF OHL
- Taaibos South WEF
- Taaibos South WEF OHL
- Taaibos 400kV Main OHL
- Soutrivier North WEF
- Soutrivier North WEF OHL
- Soutrivier Central WEF
- Soutrivier Central WEF OHL
- Soutrivier South WEF
- Soutrivier South WEF OHL
- Soutrivier 400kV Main OHL

Kind regards
Caroline

From: John Geeringh <GeerinJH@eskom.co.za>
Sent: Monday, 08 August 2022 12:56
To: Caroline Evans <c.evans@cesnet.co.za>
Subject: RE: NOTIFICATION | Soutrivier Central WEF | Draft Scoping Report PPP, 29/07/2022 - 29/08/2022

Please find attached Eskom requirements for works at or near Eskom infrastructure and servitudes, as well as the RE setbacks guideline. Please note that any infrastructure within a 2km radius from a Tx MTS must be discussed with Eskom to ensure our Transmission substations are not boxed in. Please send me a KMZ file of the affected properties, proposed development area and Grid connection.

Kind regards

John Geeringh (Pr Sci Nat) Reg. EAP (EAPASA)
Senior Consultant Environmental Management
Grid Planning: Land and Rights
Eskom Transmission Division
Megawatt Park, D1Y42, Maxwell Drive, Sunninghill, Sandton.
P O Box 1091, Johannesburg, 2000.
Tel: 011 516 7233
Cell: 083 632 7663
Fax: 086 661 4064
E-mail: john.geeringh@eskom.co.za

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15.4 COMMENTS RECEIVED

15.4.1 SAROA

WKN Windcurrent SA (Pty) Ltd
PO BOX 762
Wilderness
6560
Email: jasper@wkn-windcurrent.com
Date: 18 May 2021

Dear Jasper Dick

RE: TAAIBOS AND SOUTRIVIER PROPOSED WIND ENERGY FACILITIES: PRELIMINARY ELECTROMEGNATIC INTERFERENCE RISK ASSESSMENT.

This letter is in response to the risk assessment report for the above mentioned wind energy facilities and their possible impact on the Square Kilometre Array radio telescopes.

Based on the information provided, it is anticipated that the construction of the wind facilities will not cause radiated emissions that will negatively impact the SKA through the expected radiation of electromagnetic emissions.

Therefore, SARAO considers the project to be low risk of interference to the SKA and therefore we do not object to the development of the project, we would, however, appreciate if we can be kept informed of the project developments so that measures to control the electromagnetic emission could be put in place if necessary.

Thank you for your correspondence and our office remains open in relation to any issue relating to the above matter.

The South African Radio Astronomy Observatory (SARAO)

The South African Radio Astronomy Observatory (SARAO) spearheads South Africa's activities in the Square Kilometre Array Radio Telescope, commonly known as the SKA, in engineering, science and construction. SARAO is a National Facility managed by the National Research Foundation and incorporates radio astronomy instruments and programmes such as the MeerKAT and KAT-7 telescopes in the Karoo, the Hartebeesthoek Radio Astronomy Observatory (HartRAO) in Gauteng, the African Very Long Baseline Interferometry (AVN) programme in nine African countries as well as the associated human capital development and commercialisation endeavours.

South African Radio Astronomy Observatory (SARAO)

www.ska.ac.za

Regards,

Mr Selaelo Matlhane
Spectrum & Telecommunication Manager
South African Radio Astronomy Observatory (SARAO)
Tel: 011 442 2434
Email: smatlhane@ska.ac.za

The South African Radio Astronomy Observatory (SARAO)

The South African Radio Astronomy Observatory (SARAO) spearheads South Africa's activities in the Square Kilometre Array Radio Telescope, commonly known as the SKA, in engineering, science and construction. SARAO is a National Facility managed by the National Research Foundation and incorporates

15.4.2 SAHRA

Taaibos South WEF

Our Ref:

an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

Enquiries: Natasha Higgitt
Tel: 021 462 4502
Email: nhiggitt@sahra.org.za
CaseID: 19168

Date: Thursday August 18, 2022
Page No: 1

Interim Comment

In terms of Section 38(3), 38(8) of the National Heritage Resources Act (Act 25 of 1999)

Attention: WKN Windcurrent SA (Pty) Ltd

P.O. Box 762
Wilderness
6560

WKN-Windcurrent SA (Pty) Ltd. plans to develop, construct and operate a Wind Energy Facility (WEF) approximately 20km southeast of Loxton in the Northern Cape Province. The project site is situated in the Ubuntu Local Municipality (LM) which forms part of the Pixley ka Seme District Municipality (DM). The proposed Taaibos South Wind Energy Facility (WEF) will consist of up to 36 turbines, with a total facility output of up to 270MW. The WEF will also include a powerline and switching station in order to connect the WEF to the existing Eskom Substation (this will be applied for in a separate environmental application). The WEF will also include a Battery Energy Storage System (BESS), temporary and permanent laydown areas, an IPP Substation (SS), a Concrete Tower Manufacturing Facility (CTMF), access roads and a construction compound (CC) area. The construction footprint of the proposed WEF will be up to 139ha (inclusive of roads), rehabilitated to an operational footprint of up to 85ha (inclusive of roads).

CES Environmental and Social Advisory Services has been appointed by Taaibos South Wind Energy Facility RF (Pty) Ltd to conduct an Environmental Authorisation (EA) Application for the proposed Taaibos South Wind Energy Facility (WEF), near Loxton, Northern Cape Province.

A draft Basic Scoping Report (DSR) has been submitted in terms of the National Environmental Management Act, 1998 (NEMA) and the 2017 NEMA Environmental Impact Assessment (EIA) Regulations. The proposed development will include the construction of up to 36 turbines, permanent and temporary laydown areas adjacent to each turbine, foundations of each turbine, IPP Substation of up to 3 ha, collector substation, temporary laydown area, concrete tower manufacturing facility (CTMF) and construction compound (CC) up to 10 ha, battery energy storage system of up to 10 ha (in same area as temporary laydown, CTMF and CC), medium voltage cabling between turbines and switching stations to be laid underground where technically feasible, and internal access roads up to 36 km at up to 14 m wide.

It is noted that a field-based Heritage Impact Assessment (HIA) and field-based Palaeontological Impact

Our Ref:

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Department of Arts and Culture

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South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

Enquiries: Natasha Higgitt
Tel: 021 462 4502
Email: nhiggitt@sahra.org.za
CaseID: 19168

Date: Thursday August 18, 2022
Page No: 2

Assessment (PIA) will be undertaken as part of the EIA phase of the EA application.

Interim Comment

The SAHRA Archaeology, Palaeontology and Meteorites (APM) Unit requests that the pending assessment of the impact to heritage resources comply with section 38(3) of the NHRA as required by section 38(8) of the NHRA. The report should also comply with SAHRA 2007 Minimum Standards: Archaeological and Palaeontological Components of Impact Assessment Reports (see www.asapa.co.za or www.aphp.org.za for a list of qualified archaeologists), while the PIA should comply with the 2012 Minimum Standards: Palaeontological Component of Heritage Impact Assessments.

Any other heritage resources as defined in section 3 of the NHRA that may be impacted, such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict, and cultural landscapes or viewscapes must also be assessed.

Further comments will be issued upon receipt of the above pending reports and the draft EIA inclusive of appendices.

Should you have any further queries, please contact the designated official using the case number quoted above in the case header.

Yours faithfully

Natasha Higgitt
Heritage Officer
South African Heritage Resources Agency

Our Ref:

an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
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Enquiries: Natasha Higgitt
Tel: 021 462 4502
Email: nhiggitt@sahra.org.za
CaseID: 19168

Date: Thursday August 18, 2022
Page No: 3

Phillip Hine
Manager: Archaeology, Palaeontology and Meteorites Unit
South African Heritage Resources Agency

ADMIN:
Direct URL to case: https://sahris.sahra.org.za/node/602346
(DFFE, Ref: TBA)

15.4.3 DFFE BIODIVERSITY CONSERVATION

forestry, fisheries & the environment

Department:
Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

Private Bag X447, Pretoria, 0001, Environment House, 473 Steve Biko Road, Pretoria, 0002 Tel: +27 12 399 9000, Fax: + 27 86 625 1042

Reference: Taaibos South WEF
Enquiries: Ms M Rabothata/Ms. T Sekonko
Telephone: (012) 399 9174 **E-mail:** MRabothata@environment.gov.za

Mr. Alan Carter
CES
25 Tecoma Street
Berea
EAST LONDON
5214

Telephone Number: (+ 27) 46 622 2364
Email Address: a.carter@cesnet.co.za

PER E-MAIL

Dear Mr. Alan Carter

COMMENTS ON THE DRAFT SCOPING REPORT FOR THE PROPOSED TAAIBOS SOUTH WIND ENERGY FACILITY (WEF), UBUNTU LOCAL MUNICIPALITY, NORTHERN CAPE PROVINCE

The Directorate: Biodiversity Conservation reviewed and evaluated the aforementioned draft report.

Based on the information provided in the report, the proposed WEF is situated within the Upper Karoo Primary Focus Area and within the Conservancies in the Upper Karoo facilitated by Endangered Wildlife Trust (EWT).

Notwithstanding the above, the following recommendations must be considered in the final report:

- The Critical Biodiversity Map shows few turbines that falls within the NCPAES primary focus area. Therefore, comments must be obtained from Department of Forestry, Fisheries and the Environment Directorate: Protected Areas Planning and Management Effectiveness at Email TNethononda@environment.gov.za for attention of **Mr Thivhulawi Nethononda.**
- The detailed Biodiversity Specialist studies must be conducted, updated and submitted in your final report.
- Sensitive habitats in close proximity to the development footprint must be avoided or demarcated as No-Go area (i.e. wetlands and watercourses).
- Appropriate buffers around the sensitive habitat must be established (e.g. Drainage lines and nests)
- Permits from relevant authorities must be obtained for the removal or disturbance of any TOPS, Red Data listed or provincially protected species.

2030 NDP

Batho pele- putting people first

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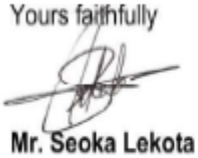
COMMENTS ON THE DRAFT SCOPING REPORT FOR THE PROPOSED TAAIBOS SOUTH WIND ENERGY FACILITY, UBUNTU LOCAL MUNICIPALITY, NORTHERN CAPE PROVINCE

The final report must comply with all the requirements as outlined in the Environmental Impact Assessment (EIA) guideline for renewable energy projects and the Best Practice Guideline for Birds & Solar Energy for assessing and monitoring the impact of solar energy facilities on birds in Southern Africa.

In conclusion, please note that all Public Participation Process documents related to Biodiversity EIA review and any other Biodiversity EIA queries must be submitted to the Directorate: Biodiversity Conservation at Email: BCAdmin@environment.gov.za for attention of **Mr Seoka Lekota.**

Yours faithfully



Mr. Seoka Lekota
Control Biodiversity Officer Grade B: Biodiversity Conservation
Department of Forestry, Fisheries & the Environment
Date: 29/08/2022

15.4.4 DFFE PROTECTED AREAS

Caroline Evans

From: Rofhiwa Magodi <RMagodi@dffe.gov.za>
Sent: Friday, 09 September 2022 21:43
To: Caroline Evans
Cc: Thivhulawi Nethononda; Lindokuhle Vilakati
Subject: RE: NOTIFICATION | Soutrivier North WEF | Draft Scoping Report PPP, 29/07/2022 - 29/08/2022

Dear Evans

The Directorate: Protected Areas Planning and Management Effectiveness, would like to thank you for the opportunity to review the Draft Scoping Report for the above-mentioned project.

After conducting the review of the submitted documents, we have noted that the proposed developments will not take place within any kind of protected areas in terms of Section 9 of the National Environmental Management: Protected Areas Act (NEMPAA), Act No. 57 of 2003. The closest protected area to the site is Victoria West Nature Reserve which is situated approximately 48.5km west of the study area. Subsequently, this directorate provides comments or input on the projects which are affecting the **national protected areas**.

However, you need to obtain comments from the provincial department in the northern cape and other I&APs.

Kind regards,
Magodi Rofhiwa

forestry, fisheries & the environment
Department:
Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

Protected Areas Planning and Management Effectiveness
Private Bag X447, Pretoria, 0001
Environment House, Steve Biko Street, Arcadia, 0002
Tel. 012 399 8801 E-mail: rmagodi@environment.gov.za
Website: www.environment.gov.za

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From: Caroline Evans <c.evans@cesnet.co.za>
Sent: Tuesday, August 30, 2022 3:15:59 PM
To: Thivhulawi Nethononda <TNETHONONDA@dffe.gov.za>
Subject: NOTIFICATION | Soutrivier North WEF | Draft Scoping Report PPP, 29/07/2022 - 29/08/2022

Dear Soutrivier North WEF Stakeholders and I&APs

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15.4.5 ESKOM

Caroline Evans

From: John Geeringh <GeerinJH@eskom.co.za>
Sent: Monday, 08 August 2022 13:00
To: Caroline Evans
Subject: RE: NOTIFICATION | Taaibos South WEF | Draft Scoping Report PPP, 29/07/2022 - 29/08/2022
Attachments: Eskom requirements for work in or near Eskom servitudes.doc; Renewable Energy Generation Plant Setbacks to Eskom Infrastructure Rev2 - signed.pdf

Please find attached Eskom requirements for works at or near Eskom infrastructure and servitudes, as well as the RE setbacks guideline. Please note that any infrastructure within a 2km radius from a Tx MTS must be discussed with Eskom to ensure our Transmission substations are not boxed in. Please send me a KMZ file of the affected properties, proposed development area and Grid connection.

Kind regards

John Geeringh (Pr Sci Nat) Reg. EAP (EAPASA)
Senior Consultant Environmental Management
Grid Planning: Land and Rights
Eskom Transmission Division
Megawatt Park, D1Y42, Maxwell Drive, Sunninghill, Sandton.
P O Box 1091, Johannesburg, 2000.
Tel: 011 516 7233
Cell: 083 632 7663
Fax: 086 661 4064
E-mail: john.geeringh@eskom.co.za

From: Caroline Evans <c.evans@cesnet.co.za>
Sent: Friday, 29 July 2022 16:46
To: Alan Carter <a.carter@cesnet.co.za>
Cc: reppp <reppp@cesnet.co.za>
Subject: [CAUTION:EXTERNAL EMAIL] - NOTIFICATION | Taaibos South WEF | Draft Scoping Report PPP, 29/07/2022 - 29/08/2022

Dear Taaibos South WEF Stakeholders and I&APs

Kindly note that a new application has been lodged for the Taaibos South WEF, proposed between Loxton and Victoria West in the Ubuntu Local Municipality of the Northern Cape Province.

The proposed Taaibos South Wind Energy Facility (WEF) will consist of up to 36 turbines, with a total facility output of up to 270MW. The WEF will also include a powerline and switching station in order to connect the WEF to the existing Eskom Substation (this will be applied for in a separate environmental application). The WEF will also include a Battery Energy Storage System (BESS), temporary and permanent laydown areas, an IPP Substation (SS), a Concrete Tower Manufacturing Facility (CTMF), access roads and a construction compound (CC) area. The construction footprint of the proposed WEF will be up to 139ha (inclusive of roads), rehabilitated to an operational footprint of up to 85ha (inclusive of roads).

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15.4.6 DFFE (COMPETENT AUTHORITY)

forestry, fisheries & the environment

Department:
Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

Private Bag X 447· PRETORIA 0001· Environment House 473 Steve Biko Road, Arcadia,· PRETORIA

DFFE Reference: 14/12/16/3/3/2/2187
Enquiries: Mr J Mpelane
Telephone: (012) 399 9404, **E-mail:** Jmpelane@dffe.gov.za

Dr Alan Carter
Coastal and Environmental Services (Pty) Ltd. t/a CES
PO Box 8145
Berea
EAST LONDON
5214

Telephone Number: (043) 726 7809
Email Address: a.carter@cesnet.co.za

PER MAIL / E-MAIL

Dear Dr Carter

COMMENTS ON THE DRAFT SR FOR THE PROPOSED TAAIBOS SOUTH WIND ENERGY FACILITY, UBUNTU LOCAL MUNICIPALITY, NORTHERN CAPE PROVINCE

The Application for Environmental Authorisation and Draft SR (SR) dated July 2022 and received by the Department on 10 August 2022, refer.

This letter serves to inform you that the following information must be included to the Final SR:

1. Application form:
   a) Please clarify the reason this Department is the Competent Authority. State clearly if the applicant intends to bid the project in terms of the Integrated Resource Plan (IRP). Be advised that the reasons for this Department being the Competent Authority must be clearly presented in Section 1 –Competent Authority in the application form.
   b) Ensure that the SG codes, farm names and numbers are correct and consisted throughout the reports.

2. Listed Activities
   a) It is noted that the proposed wind energy facility does not fall within any strategic corridors or development zones, therefore the application will be considered as a normal EIA Application.
   b) Please ensure that all relevant listed activities are applied for, are specific and can be linked to the development activity or infrastructure (including thresholds) as described in the project description. Only activities (and sub-activities) applicable to the development must be applied for and assessed.
   c) Please refer to the on-site substation in the project description under Activity 11 LN1 and include the capacity of the proposed substation. Confirm whether this substation includes an IPP substation and a facility substation and whether this, does trigger this activity.
   d) It is imperative that the relevant authorities are continuously involved throughout the environmental impact assessment process, as the development property possibly falls within

wrk

geographically designated areas in terms of Listing Notice 3 Activities. Written comments must be obtained from the relevant authorities (or proof of consultation if no comments were received) and submitted to this Department. In addition, a graphical representation of the proposed development within the respective geographical areas must be provided. Please also ensure that the potential impacts on the affected Critical Biodiversity Areas and Ecological Support Areas are fully assessed in the final EIAR.

e) Activities related to BESS LN2 Activity 4 Kindly note, that BESS' are not considered to trigger Listing LN2 Activity (4) as the batteries are not considered to be containers. Their intrinsic purpose is not to store a dangerous good – but rather to store energy. This applies when the battery/BESS is already assembled, regardless of its type. However, if unassembled and the substance/ substances making up the reactants/ electrolytes are stored in containers on site, and such storage meets or exceeds the threshold indicated in the relevant listed or specified activity (and meets the definition of "dangerous goods" as per the 3 Listing Notices under the EIA Regulations, 2014, as amended), then such identified activity may still be triggered. This would also apply with respect to maintenance- if any dangerous goods are stored on site in a container/ containers where the capacity meets or exceeds the thresholds in any of the listed or specified activities related to the storage or storage and handling of a dangerous goods, then such would be triggered, requiring environmental authorisation.

f) All 3 Listing Notices must be carefully considered to identify any other listed or specified activity, which may be triggered by the proposed development of a BESS.

g) As indicated above, please ensure that all relevant listed activities are applied for, are specific and can be linked to the development activity or infrastructure (including thresholds) as described in the project description. Only activities (and sub-activities) applicable to the development must be applied for and assessed.

h) If the activities applied for in the application form differ from those mentioned in the final SR, an amended application form must be submitted. Please note that the Department's application form template has been amended and can be downloaded from the following link https://www.dffe.gov.za/documents/forms.

3. **Layout & Sensitivity Maps**

a) The final SR must provide coordinate points for the proposed development site (note that if the site has numerous bend points, at each bend point coordinates must be provided) as well as the start, middle and end point of all linear activities.

b) All preferred turbine positions must be clearly numbered. The turbine position numbers must be consistently used in all maps to be included in the final SR.

c) The final SR must provide the technical details of the proposed facility in a table format as well as their description and/or dimensions.

d) A copy of the layout map must be submitted with the final SR. All available biodiversity information must be used in the finalisation of the layout map. Existing infrastructure must be used as far as possible, e.g. roads. The layout map must indicate the following:

- The envisioned area for the wind energy facility, i.e. location of wind turbines and all associated infrastructure including BESS, should be mapped at an appropriate scale.
- All supporting onsite infrastructure such as laydown areas, guard house, control room, and buildings, including accommodation etc.
- All necessary details regarding all possible locations and sizes of the main substation and internal power lines.
- All existing infrastructure on the site, especially internal road infrastructure.

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e) Please provide an environmental sensitivity map, if possible, which indicates the following:
- The location of sensitive environmental features on site, e.g. CBAs, protected areas, heritage sites, wetlands, drainage lines etc. that will be affected by the facility and its associated infrastructure;
- Buffer areas; and
- All "no-go" areas.

f) The above layout map must be overlain with the sensitivity map and a cumulative map which shows neighbouring energy developments and existing grid infrastructure.

g) Include a map which shows this application in relation to proposed Taaibos South Wind Energy Facility, Ubuntu Local Municipality, Northern Cape Province.

h) Google maps will not be accepted for decision-making.

4. Alternatives

a) Please note that you are required to provide a full description of the process followed to reach the proposed preferred alternative within the site, in terms of Appendix 2(2)(1)(g) of the EIA Regulations 2014, as amended, including the following content:
i. details of all the 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 way the issues were incorporated, or the reasons for not including them;
iv. the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;
v. the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts—
(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 associated with the alternatives;
vii. positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;
viii. the possible mitigation measures that could be applied and level of residual risk;
ix. the outcome of the site selection matrix;
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 alternatives, including preferred location of the activity.

b) Written proof of an investigation and motivation if no reasonable or feasible alternatives exist in terms of Appendix 2.

c) It is noted that the report distinguishes between construction phase and operational or post construction phase. Please ensure this is clearly detailed in the report, especially when footprints change between components e.g., the temporary laydown area, CTMF and CC of up to 10ha will be converted into the BESS facility post-construction.

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5. **Public Participation Process**

a) Please ensure that all issues raised, and comments received on the draft SR from registered I&APs and organs of state which have jurisdiction in respect of the proposed activity are adequately addressed in the Final SR. This includes but is not limited to the Northern Cape Department of Environment and Nature Conservation, the Department of Agriculture, Forestry and Fisheries (DAFF), the provincial Department of Agriculture, the South African Civil Aviation Authority (SACAA), the Department of Transport, the Local Municipality, the District Municipality, the Department of Water and Sanitation (DWS), the South African National Roads Agency Limited (SANRAL), the South African Heritage Resources Agency (SAHRA), the Endangered Wildlife Trust (EWT), BirdLife SA, the Department of Mineral Resources, the Department of Rural Development and Land Reform, the Square Kilometre Array (SKA) and the Department of Environmental Affairs: Directorate Biodiversity and Conservation.

b) Proof of correspondence with the various stakeholders must be included in the Final SR. Should you be unable to obtain comments, proof must be submitted to the Department of the attempts that were made to obtain comments. The Public Participation Process must be conducted in terms of the approved public participation plan and Regulation 39, 40, 41, 42, 43 & 44 of the NEMA EIA Regulations 2014, as amended.

c) A comments and response trail report (C&R) must be submitted with the final SR. The C&R report must incorporate all historical comments (pre and post submission of the draft SR for this development. The C&R report must be a separate document from the main report and the format must be in the table format which reflects the details of the I&APs and date of comments received, actual comments received, and response provided. Please ensure that comments made by I&APs are comprehensively captured (copy verbatim if required) and responded to clearly and fully. Please note that a response such as "Noted" is not regarded as an adequate response to I&AP's comments.

6. **Specialist Assessments to be conducted in the EIA Phase**

a) A Wake Effect Assessment must be included as part of the specialist assessments to be conducted during the draft EIA phase.

b) Specialist studies to be conducted must provide a detailed description of their methodology, as well as indicate the locations and descriptions of turbine positions, BESS, and all other associated infrastructures that they have assessed and are recommending for authorisation.

c) The specialist studies must also provide a detailed description of all limitations to their studies. All specialist studies must be conducted in the right season and providing that as a limitation, will not be accepted.

d) Please note that the Department considers a 'no-go' area, as an area where no development of any infrastructure is allowed; therefore, no development of associated infrastructure including access roads is allowed in the 'no-go' areas. Should the specialist definition of 'no-go' area differ from the Departments definition; this must be clearly indicated. The specialist must also indicate the 'no-go' area's buffer if applicable.

e) Should the appointed specialists specify contradicting recommendations, the EAP must clearly indicate the most reasonable recommendation and substantiate this with defendable reasons; and were necessary, include further expertise advice.

f) It is brought to your attention that Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation, which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. "the Protocols"), and in Government Notice No. 1150 of 30 October 2020 (i.e. protocols for terrestrial plant and animal species), have come into effect. **Please note that specialist assessments must be**

conducted in accordance with these protocols. Please note further that the protocols require the specialists' to be registered with SACNASP in their respective field.

g) Please include a table in the report, summarising the specialist studies required by the Department's Screening Tool, a column indicating whether these studies were conducted or not, and a column with motivation for any studies not conducted. Please note that if any of the specialists' studies and requirements/protocols recommended in the Department's Screening Tool are not commissioned, motivation for such must be provided in the report per the requirements of the Protocols.

h) The avifauna and bat specialist studies must be conducted according to the latest BirdLife South Africa/Endangered Wildlife Trust: Best practice guidelines for avian monitoring and impact mitigation at proposed wind energy development sites in Southern Africa and the latest South African Bat Assessment Advisory Panel's (SABAAP) guidelines.

i) Please ensure that, all required specialist studies for the project are recommended and conducted. Finding and recommendations of the specialist studies must incorporate with final report for decision making.

7. **Cumulative Assessment to be conducted in the EIA Phase**

Should there be any other similar projects within a 30km radius of the proposed development site, the cumulative impact assessment for all identified and assessed impacts must be refined to indicate the following:

- Identified cumulative impacts must be clearly defined, and where possible the size of the identified impact must be quantified and indicated, i.e., hectares of cumulatively transformed land.
- Detailed process flow and proof must be provided, to indicate how the specialist's recommendations, mitigation measures and conclusions from the various similar developments in the area were taken into consideration in the assessment of cumulative impacts and when the conclusion and mitigation measures were drafted for this project.
- The cumulative impacts significance rating must also inform the need and desirability of the proposed development.
- A cumulative impact environmental statement on whether the proposed development must proceed.

8. **Environmental Management Programme**

The EMPr must include the following:

a) It is drawn to your attention that for substation and overhead electricity transmission and distribution infrastructure, when such facilities trigger activity 11 or 47 of the Environmental Impact Assessment Regulations Listing Notice 1 of 2014, as amended, and any other listed and specified activities necessary for the realisation of such facilities, the generic Environmental Management Programme, must be used and submitted with the final report over and above the EMPr for the facility.

b) There needs to be an EMPr for the facility, the onsite substation as well as the power line, for whichever alternative is chosen.

c) Further to the above, you are required to comply with the content of the EMPr in terms of Appendix 4 of the Environmental Impact Assessment Regulations, 2014, as amended.

d) The EMPr must consider the following, and where possible, include:

i. An alien invasive management plan to be implemented during construction and operation of the facility. The plan must include mitigation measures to reduce the invasion of alien species and ensure that the continuous monitoring and removal of alien species is undertaken.

ii. A plant rescue and protection plan which allows for the maximum transplant of conservation important species from areas to be transformed. This plan must be compiled by a vegetation

specialist familiar with the site and be implemented prior to commencement of the construction phase.

iii. An avifauna monitoring and management plan to be implemented during the construction and operation of the facility. This plan must be drafted by a suitably qualified avifauna specialist.

iv. A re-vegetation and habitat rehabilitation plan to be implemented during the construction and operation of the facility. Restoration must be undertaken as soon as possible after completion of construction activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats.

v. An open space management plan to be implemented during the construction and operation of the facility.

vi. A traffic management plan for the site access roads to ensure that no hazards would result from the increased truck traffic and that traffic flow would not be adversely impacted. This plan must include measures to minimize impacts on local commuters e.g. limiting construction vehicles travelling on public roadways during the morning and late afternoon commute time and avoid using roads through densely populated built-up areas so as not to disturb existing retail and commercial operations.

vii. A transportation plan for the transport of components, main assembly cranes and other large pieces of equipment.

viii. A storm water management plan to be implemented during the construction and operation of the facility. The plan must ensure compliance with applicable regulations and prevent off-site migration of contaminated storm water or increased soil erosion. The 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. Drainage measures must promote the dissipation of storm water run-off.

ix. A fire management plan to be implemented during the construction and operation of the facility.

x. An erosion management plan for monitoring and rehabilitating erosion events associated with the facility. Appropriate erosion mitigation must form part of this plan to prevent and reduce the risk of any potential erosion.

xi. An effective monitoring system to detect any leakage or spillage of all hazardous substances during their transportation, handling, use and storage. This must include precautionary measures to limit the possibility of oil and other toxic liquids from entering the soil or storm water systems.

xii. Measures to protect hydrological features such as streams, rivers, pans, wetlands, dams and their catchments, and other environmental sensitive areas from construction impacts including the direct or indirect spillage of pollutants.

e) The EAP must provide detailed motivation if any of the above requirements is not required by the proposed development and not included in the EMPr.

General

You are further reminded to comply with Regulation 21(1) of the NEMA EIA Regulations 2014, as amended, which states that:

"If S&EIR must be applied to an application, the applicant must, within 44 days of receipt of the application by the competent authority, submit to the competent authority a SR which has 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"

You are are further reminded that the final SR to be submitted to this Department must comply with all the requirements in terms of the scope of assessment and content of SRs in accordance with Appendix 2 and Regulation 21(1) of the EIA Regulations 2014, as amended.

Further note that in terms of Regulation 45 of the NEMA EIA Regulations 2014, as amended, this application will lapse if the applicant fails to meet any of the timeframes prescribed in terms of these Regulations, unless an extension has been granted in terms of Regulation 3(7).

You are hereby reminded of Section 24F of the National Environmental Management Act, Act No. 107 of 1998, as amended, that no activity may commence prior to an Environmental Authorisation being granted by the Department.

Yours sincerely

Ms Milicent Solomons
Acting Chief Director: Integrated Environmental Authorisations
Department of Forestry, Fisheries and the Environment
Letter signed by: Mr Wayne Hector
Designation: Deputy Director: Priority Infrastructure Projects
Date: 08/09/22

cc:	Jasper Dick	Taaibos South Central Wind Energy Facility RF (Pty) Ltd.	Email: jasper@wkn-windcurrent.com
		Taaibos South Central Wind Energy Facility RF (Pty) Ltd.	Email: mrwolf@wkn-windcurrent.com
	Mr Leon October	Northern Cape DALRRD	Email: loctober@ncpg.gov.za
	Ms Noncelea Mkontwana	Ubuntu Local Municipality	Email:; nmkontwana@ubuntu.gov.za
		Ubuntu Local Municipality	Email: nmontwana@gmail.com

16 APPENDIX D | COMMENTS AND RESPONSE REPORT

Comments	Stakeholder/I&AP	Response
COMMENTS ON THE DRAFT SCOPING REPORT FOR THE TAAIBOS SOUTH WIND ENERGY FACILITY, UBUNTU LOCAL MUNICIPALITY, NORTHERN CAPE PROVINCE The Directorate: Biodiversity Conservation has reviewed and evaluated the report. Based on the information provided in the report, the proposed WEF is situated within the Upper Karoo Primary Focus Area and within the Conservancies in the Upper Karoo facilitated by the Endangered Wildlife Trust (EWT). Notwithstanding the above, the following recommendations must be considered in the final report: • The Critical Biodiversity Map shows few turbines that fall within the NCPAES primary focus area. Therefore comments must be obtained from Department of Forestry, Fisheries and the Environment Directorate: Protected Areas Planning and Management Effectiveness at Email TNethononda@environment.gov.za for attention of **Mr Thivhulawi Nethononda**. • The detailed Biodiversity Specialist studies must be conducted, updated and submitted in your final report. • Sensitive habitats in close proximity to the development footprint must be avoided or demarcated as No-Go areas (i.e. wetlands and watercourses) • Appropriate buffers around sensitive habitat must be established (e.g. Drainage lines and nests)	**Department of Forestry, Fisheries and the Environment (DFFE): Biodiversity Conservation** **Ms Rabothata Sekonoko Makitla** **29/08/2022**	Thank you for your comments on the proposed Taaibos South WEF Draft Scoping Report. Please note that the Final Scoping Report has been updated to include the Screening Tool Results (please see section 9.3 of this report). Please kindly see responses below: • Please see Appendix C of this report, Section 14.4.4 for the comment received from Department of Forestry, Fisheries and the Environment Directorate: Protected Areas Planning and Management Effectiveness stating that they do not have further comments on this development. • Please note that this is the Scoping Phase of the EIA process. The detailed Biodiversity Specialist studies will be conducted and submitted during the EIA Phase. • Specialist studies will inform No-Go and other sensitive areas. • Specialist studies will inform No-Go and other sensitive areas. • The EAP hereby confirms that permits will be required prior to construction. Thank you for your comments as a key stakeholder on this project. We look forward to engaging with you further.

Comments	Stakeholder/I&AP	Response
• Permits from relevant authorities must be obtained for the removal or disturbance of any TOPS, Red Data listed or provincially protected species. The final report must comply with all the requirements as outlined in the Environmental Impact Assessment (EIA) guideline for renewable energy projects and the Best Practice Guideline for Birds and Solar Energy for assessing and monitoring the impact of solar energy facilities on birds in Southern Africa. In conclusion, the Public Participation Process documents related to Biodiversity EIA for review and queries should be submitted to the Directorate: Biodiversity Conservation at Email: BCAdmin@dffe.gov.za for the attention of Mr Seoka Lekota.		
COMMENTS ON THE DRAFT SCOPING REPORT FOR THE PROPOSED TAAIBOS SOUTH WIND ENERGY FACILITY (WEF), UBUNTU LOCAL MUNICIPALITY, NORTHERN CAPE PROVINCE The Application for Environmental Authorisation and Draft SR (SR) dated July 2022 and received by the Department on 10 August 2022, refer. This letter serves to inform you that the following information must be included to the Final SR: 1. Application Form: a) Please clarify the reason this Department is the Competent Authority. State clearly if the applicant intends to bid the project in terms of the IRP. Be advised that the reasons for this Department being the Competent Authority must be clearly presented in Section 1 –Competent Authority in the application form.	**Department of Forestry, Fisheries and the Environment (DFFE)** **Mr Jay-Jay Mpelane** **07/09/2022**	Thank you for your comments on the proposed Taaibos South WEF Draft Scoping Report. 1. Application Form: a) The Application Form has been updated to specifically state that the project is being prepared with the intension to bid the project in terms of the IRP. b) The EAP confirms that the SG codes, farm names and numbers are correct and consisted throughout the Application Form and the Draft Scoping Report. The EAP also confirms that this will be checked throughout the reports going forward.. 2. Listed Activities a) The EAP acknowledges that this is correct. b) The EAP confirms that the listed activities and sub-activities related to specific infrastructure of the

Comments	Stakeholder/I&AP	Response
b) Ensure that the SG codes, farm names and numbers are correct and consisted throughout the reports. 2. Listed Activities a) It is noted that the proposed wind energy facility does not fall within any strategic corridors or development zones, therefore the application will be considered as a normal EIA Application. b) Please ensure that all relevant listed activities are applied for, are specific and can be linked to the development activity or infrastructure (including thresholds) as described in the project description. Only activities (and sub-activities) applicable to the development must be applied for and assessed. c) Please refer to the on-site substation in the project description under Activity 11 LN1 and include the capacity of the proposed substation. Confirm whether this substation includes an IPP substation and a facility substation and whether this, does trigger this activity. d) It is imperative that the relevant authorities are continuously involved throughout the environmental impact assessment process, as the development property possibly falls within geographically designated areas in terms of Listing Notice 3 Activities. Written comments must be obtained from the relevant authorities (or proof of consultation if no comments were received) and submitted to this Department. In addition, a graphical representation of the proposed development within the respective geographical areas must be provided. Please also ensure that the potential impacts on the affected Critical Biodiversity Areas and Ecological Support Areas are fully assessed in the final EAIR.		proposed development. These listed activities are being assessed as part of the EIA phase. c) The EAP confirms that the capacity of the IPP SS has been included in the updated Application Form. The IPP SS has a 33/132kV capacity. d) The EAP has included the relevant biodiversity and Listing Notice 3 stakeholders as part of the Stakeholder and I&AP database. All Stakeholders and I&APs will be consulted throughout the process, please see Appendix C of this report for the PPP proofs. This document (Appendix D) will be maintained and updated throughout the Scoping and EIA process, in chronological order. The EAP also confirms that the potential impacts on the affected Critical Biodiversity Areas and Ecological Support Areas will be fully assessed in the EIA process (inclusive of specialist reports). e) The EAP confirms that LN2 Activity 4 has been applied for as it relates to the onsite storage of dangerous good related to the construction and operational phases of the WEF. LN2 Activity 4 has also been included as it relates to one of the BESS technology alternatives. These alternatives will be assessed and refined in the EIA Phase, after which, if applicable, this section of the description in LN2 Activity 4 will be removed. f) The EAP confirms that the LN3 activities have been carefully considered and applied for. g) The activities applied for in the Application Form and the Scoping Report are aligned. The EAP has, however, submitted an updated application form in response to 1.a) of the Departments comments. 3. Layout and Sensitivity Maps

Comments	Stakeholder/I&AP	Response
e) Activities related to BESS and LN1 Activity 14; LN2 Activity 4 and LN3 Activity 10: Kindly note, that BESS' are not considered to trigger Listing Notice (LN) LN1 Activity (14) and Activity (51); LN2 Activity (4) and; LN3 Activity (10) and Activity (22) as the batteries are not considered to be containers. Their intrinsic purpose is not to store a dangerous good, but rather to store energy. This applies when the battery/BESS is already assembled, regardless of its type. However, if unassembled and the substance/ substances making up the reactants/ electrolytes are stored in containers on site, and such storage meets or exceeds the threshold indicated in the relevant listed or specified activity (AND meets the definition of "dangerous goods" as per the 3 Listing Notices under the EIA Regulations, 2014, as amended), then such identified activity may still be triggered. This would also apply with respect to maintenance- if any dangerous goods are stored on site in a container / containers where the capacity meets or exceeds the thresholds in any of the listed or specified activities related to the storage or storage and handling of a dangerous goods, then such would be triggered, requiring environmental authorisation. f) All 3 Listing Notices must be carefully considered to identify any other listed or specified activity, which may be triggered by the proposed development of a BESS. g) If the activities applied for in the application form differ from those mentioned in the final SR, an amended application form must be submitted. Please note that the Department's application form template has been amended and can be downloaded from the following link https://www.dffe.gov.za/documents/forms. 3. Layout and Sensitivity Maps		a) Please see Table 2-4 and Figure 2-4 in Chapter 2 of this report for the coordinates for the site. b) The Sensitivity Maps have been included in Section 8.5 of this Report in which all turbine numbers area clearly visible. This numbering will be maintained throughout the EIA Phase for ease of reference. c) Please see Chapter 2.1, Table 2-1 for the full technical details of the WEF (inclusive of dimensions). d) The Preliminary Sensitivity Maps have been included with all available infrastructure and sensitivities. This can be found in Section 8.5 of this report. A refined layout will be provided during the EIA phase, inclusive of a full and final sensitivity assessment based on final specialist feedback. e) The Preliminary Sensitivity Maps have been included with all available infrastructure and sensitivities. This can be found in Section 8.5 of this report. A refined layout will be provided during the EIA phase, inclusive of a full and final sensitivity assessment based on final specialist feedback. f) The Preliminary Sensitivity Maps have been included with all available infrastructure and sensitivities. This can be found in Section 8.5 of this report. A refined layout will be provided during the EIA phase, inclusive of a full and final sensitivity assessment based on final specialist feedback. g) The Preliminary Sensitivity Maps have been included with all available infrastructure and sensitivities. This can be found in Section 8.5 of this report. A refined layout will be provided during the EIA phase, inclusive of a full and final sensitivity assessment based on final specialist feedback.

Comments	Stakeholder/I&AP	Response
a) The final SR must provide coordinate points for the proposed development site (note that if the site has numerous bend points, at each bend point coordinates must be provided) as well as the start, middle and end point of all linear activities. b) All preferred turbine positions must be clearly numbered. The turbine position numbers must be consistently used in all maps to be included in the final SR. c) The final SR must provide the technical details of the proposed facility in a table format as well as their description and/or dimensions. d) A copy of the layout map must be submitted with the final SR. All available biodiversity information must be used in the finalisation of the layout map. Existing infrastructure must be used as far as possible, e.g. roads. The layout map must indicate the following: o The envisioned area for the wind energy facility, i.e. location of wind turbines and all associated infrastructure including BESS, should be mapped at an appropriate scale. o All supporting onsite infrastructure such as laydown areas, guard house, control room, and buildings, including accommodation etc. o All necessary details regarding all possible locations and sizes of the main substation and internal power lines. o All existing infrastructure on the site, especially internal road infrastructure. e) Please provide an environmental sensitivity map, if possible, which indicates the following: o The location of sensitive environmental features on site, e.g. CBAs, protected areas, heritage sites,		h) The Preliminary Sensitivity Maps have been included with all available infrastructure and sensitivities. This can be found in Section 8.5 of this report. A refined layout will be provided during the EIA phase, inclusive of a full and final sensitivity assessment based on final specialist feedback. 4. Alternatives a) The EAP acknowledges the required process in terms of Alternatives. i. Please kindly see Chapter 7 of this Report, Table 7-1; ii. Please kindly see Chapter 10, Appendix C and Appendix D of this Report; iii. Please kindly see Appendix C and Appendix D of this Report; iv. Please kindly see Chapters 5, Chapter 6 and Chapter 7 of this Report, inclusive of Table 7-1; v. Please see Chapter 8 of this Report; vi. Please see Chapter 8 of this Report; vii. Please see Chapters 7 and 8 of this Report; viii. Please see Chapter 8 of this Report; ix. Please see Chapters 7 and 8 of this Report; x. Please see Chapters 7 and 8 of this Report; and xi. Please see Chapters 7, 8, 9 and 11 of this Report. b) Please see Chapter 7 (Table 7-1) and Chapter 8 (Sections 8.1, 8.2 and 8.3). c) The EIA phase will refine which aspects occur in which phases in a more detailed manner. Please

Comments	Stakeholder/I&AP	Response
wetlands, drainage lines etc. that will be affected by the facility and its associated infrastructure; o Buffer areas; and o All "no-go" areas. f) The above layout map must be overlain with the sensitivity map and a cumulative map which shows neighbouring energy developments and existing grid infrastructure. g) Include a map which shows this application in relation to Soutrivier South WEF, Central WEF and Taaibos North and South WEF i.e. current Wind applications in this area. h) Google maps will not be accepted for decision-making. 4. Alternatives a) Please note that you are required to provide a full description of the process followed to reach the proposed preferred alternative within the site, in terms of Appendix 2(2)(1)(g) of the NEMA EIA Regulations 2014, as amended, including the following content: i. details of all the 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 way the issues were incorporated, or the reasons for not including them; iv. the environmental attributes associated with the alternatives		kindly refer to Chapter 8 of this report for potential impacts, related to each phase of development, which require further assessment in the EIA Phase of this process. 5. Public Participation Process a) Please kindly refer to Chapter 10 for the Stakeholder and I&AP Database which will be maintained throughout the process. All proofs of PPP are available in Appendix C of this Report and the Comments and Response Report is available in Appendix D. b) Kindly refer to Chapter 10 (PPP process, inclusive of Stakeholder and I&AP database, Appendix C (PPP Proofs); and Appendix D (Comments and Response Report). c) Please kindly refer to this report, appended to the Final Scoping Report as Appendix D, the full Comments and Response Report. Comments have been extracted verbatim and responded to in detail. For PPP proofs kindly see Appendix C of this report. 6. The EAP acknowledges the following comments on the Specialist component of the EIA Phase a) The EAP disputes the need for a Wake Effect Assessment as the site does not have any operational WEFs within 30km of the site. This will be confirmed by the specialists during the EIA Phase. As no operational WEFs are located within the Cluster's vicinity no quantitative Wake Effect Assessment would be possible. The EAP hereby requests that the DFFE reconsider this requirement. Kindly refer to Chapter 8.4 of this

Comments	Stakeholder/I&AP	Response
focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; v. the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts— (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 associated with the alternatives; vii. positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; viii. the possible mitigation measures that could be applied and level of residual risk; ix. the outcome of the site selection matrix; x. if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and		Report for the Cumulative Assessment process (which includes information regarding surrounding WEFs). b) The EAP confirms that this will be included in the specialist studies. c) The EAP confirms that this will be included in the specialist studies. No specialist assessments have been conducted outside of the appropriate season. d) The EAP confirms that no-go areas which are not aligned to the Departments definition will be clearly defined, if applicable. e) The EAP confirms that should the appointed specialists specify contradicting recommendations, the EAP will clearly indicate the most reasonable recommendation and substantiate this with defendable reasons; and were necessary, include further expertise advice. f) The EAP confirms that specialist assessments are being undertaken in accordance with the specialist protocols by suitably qualified and registered specialists. g) Please see Chapter 9.3 of this report. h) The EAP confirms that avifaunal and bat specialist assessments are being undertaken in accordance with the latest BirdLife South Africa/Endangered Wildlife Trust: Best practice guidelines for avian monitoring and impact mitigation at proposed wind energy development sites in Southern Africa and the latest South African Bat Assessment Advisory Panel's (SABAAP) guidelines. 7. Cumulative Assessment to be conducted in the EIA Phase

Comments	Stakeholder/I&AP	Response
xi. a concluding statement indicating the preferred alternatives, including preferred location of the activity. b) Written proof of an investigation and motivation if no reasonable or feasible alternatives exist in terms of Appendix 2. c) It is noted that the report distinguishes between construction phase and operational or post construction phase. Please ensure this is clearly detailed in the report, especially when footprints change between components e.g., the temporary laydown area, CTMF and CC of up to 10ha will be converted into the BESS facility post-construction. 5. Public Participation Process a) Please ensure that all issues raised, and comments received on the draft SR from registered I&APs and organs of state which have jurisdiction in respect of the proposed activity are adequately addressed in the final SR. This includes but is not limited to the Northern Cape Department of Environment and Nature Conservation, the Department of Agriculture, Forestry and Fisheries (DAFF), the provincial Department of Agriculture, the South African Civil Aviation Authority (SACAA), the Department of Transport, the Local Municipality, the District Municipality, the Department of Water and Sanitation (DWS), the South African National Roads Agency Limited (SANRAL), the South African Heritage Resources Agency (SAHRA), the Endangered Wildlife Trust (EWT), BirdLife SA, the Department of Mineral Resources, the Department of Rural Development and Land Reform, the Square Kilometre Array (SKA) and the Department of Environmental Affairs: Directorate Biodiversity and Conservation.		a) Please kindly see Chapter 8.4 of this Report for the full proposed Cumulative Impact Assessment methodology. 8. Environmental Management Programme a) The EAP hereby confirms that a generic EMPr will be completed for the SS component of this application. An Appendix 4 Standard EMPr will also be submitted for this application. These documents will form part of the EIA phase. b) The EAP hereby confirms that a generic EMPr will be completed for the SS component of this application. An Appendix 4 Standard EMPr will also be submitted for this application. These documents will form part of the EIA phase. The overhead line component will form part of a separate basic assessment application. This process will include a generic EMPr for the OHL. c) The EAP confirms that the standard EMPr will be prepared in accordance with Appendix 4 of the Environmental Impact Assessment Regulations, 2014, as amended. d) The EAP confirms that the below listed Management Plans will be included as part of the EMPr. It must be noted that detailed management plans will not be prepared as part of the EIA phase as ground truthing will have to take place prior to finalisation. However, this will take place in the EMPr and Layout finalisation process should the project be awarded preferred bidder status in years to come: i. An alien invasive management plan to be implemented during construction and operation of the facility. The plan

Comments	Stakeholder/I&AP	Response
b) Proof of correspondence with the various stakeholders must be included in the Final SR. Should you be unable to obtain comments, proof must be submitted to the Department of the attempts that were made to obtain comments. The Public Participation Process must be conducted in terms of the approved public participation plan and Regulation 39, 40, 41, 42, 43 & 44 of the EIA Regulations 2014, as amended. c) A comments and response trail report (C&R) must be submitted with the final SR. The C&R report must incorporate all historical comments (pre and post submission of the draft SR) for this development. The C&R report must be a separate document from the main report and the format must be in the table format which reflects the details of the I&APs and date of comments received, actual comments received, and response provided. Please ensure that comments made by I&APs are comprehensively captured (copy verbatim if required) and responded to clearly and fully. Please note that a response such as "Noted" is not regarded as an adequate response to I&AP's comments. 6. Specialist Assessments to be conducted in the EIA Phase a) A Wake Effect Assessment must be included as part of the specialist assessments to be conducted during the draft EIA phase. b) Specialist studies to be conducted must provide a detailed description of their methodology, as well as indicate the locations and descriptions of turbine positions, BESS, and all other associated infrastructures that they have assessed and are recommending for authorisation. c) The specialist studies must also provide a detailed description of all limitations to their studies. All		must include mitigation measures to reduce the invasion of alien species and ensure that the continuous monitoring and removal of alien species is undertaken. ii. A plant rescue and protection plan which allows for the maximum transplant of conservation important species from areas to be transformed. This plan must be compiled by a vegetation specialist familiar with the site and be implemented prior to commencement of the construction phase. iii. An avifauna monitoring and management plan to be implemented during the construction and operation of the facility. This plan must be drafted by a suitably qualified avifauna specialist. iv. A re-vegetation and habitat rehabilitation plan to be implemented during the construction and operation of the facility. Restoration must be undertaken as soon as possible after completion of construction activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats. v. An open space management plan to be implemented during the construction and operation of the facility.

Comments	Stakeholder/I&AP	Response
specialist studies must be conducted in the right season and providing that as a limitation, will not be accepted. d) Please note that the Department considers a 'no-go' area, as an area where no development of any infrastructure is allowed; therefore, no development of associated infrastructure including access roads is allowed in the 'no-go' areas. Should the specialist definition of 'no-go' area differ from the Departments definition; this must be clearly indicated. The specialist must also indicate the 'no-go' area's buffer if applicable. e) Should the appointed specialists specify contradicting recommendations, the EAP must clearly indicate the most reasonable recommendation and substantiate this with defendable reasons; and were necessary, include further expertise advice. f) It is brought to your attention that Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation, which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. "the Protocols"), and in Government Notice No. 1150 of 30 October 2020 (i.e. protocols for terrestrial plant and animal species), have come into effect. Please note that specialist assessments must be conducted in accordance with these protocols. Please note further that the protocols require the specialists' to be registered with SACNASP in their respective field. g) Please include a table in the report, summarising the specialist studies required by the Department's Screening Tool, a column indicating whether these studies were conducted or not, and a column with motivation for any studies not conducted. Please note		vi. A traffic management plan for the site access roads to ensure that no hazards would result from the increased truck traffic and that traffic flow would not be adversely impacted. This plan must include measures to minimize impacts on local commuters e.g. limiting construction vehicles travelling on public roadways during the morning and late afternoon commute time and avoid using roads through densely populated built-up areas so as not to disturb existing retail and commercial operations. vii. A transportation plan for the transport of components, main assembly cranes and other large pieces of equipment. viii. A storm water management plan must be implemented during the construction and operation of the facility. The plan must ensure compliance with applicable regulations and prevent offsite migration of contaminated storm water or increased soil erosion. The 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. Drainage measures must promote the dissipation of storm water run-off.

Comments	Stakeholder/I&AP	Response
that if any of the specialists' studies and requirements/protocols recommended in the Department's Screening Tool are not commissioned, motivation for such must be provided in the report per the requirements of the Protocols. h) The avifauna and bat specialist studies must be conducted according to the latest BirdLife South Africa/Endangered Wildlife Trust: Best practice guidelines for avian monitoring and impact mitigation at proposed wind energy development sites in Southern Africa and the latest South African Bat Assessment Advisory Panel's (SABAAP) guidelines. 7. Cumulative Assessment to be conducted in the EIA Phase a) Should there be any other similar projects within a 30km radius of the proposed development site, the cumulative impact assessment for all identified and assessed impacts must be refined to indicate the following: o Identified cumulative impacts must be clearly defined, and where possible the size of the identified impact must be quantified and indicated, i.e., hectares of cumulatively transformed land. o Detailed process flow and proof must be provided, to indicate how the specialist's recommendations, mitigation measures and conclusions from the various similar developments in the area were taken into consideration in the assessment of cumulative impacts and when the conclusion and mitigation measures were drafted for this project. o The cumulative impacts significance rating must also inform the need and desirability of the proposed development.		ix. A fire management plan must be implemented during the construction and operation of the facility. x. An erosion management plan for monitoring and rehabilitating erosion events associated with the facility. Appropriate erosion mitigation must form part of this plan to prevent and reduce the risk of any potential erosion. xi. An effective monitoring system to detect any leakage or spillage of all hazardous substances during their transportation, handling, use and storage. This must include precautionary measures to limit the possibility of oil and other toxic liquids from entering the soil or storm water systems. xii. Measures to protect hydrological features such as streams, rivers, pans, wetlands, dams and their catchments, and other environmental sensitive areas from construction impacts including the direct or indirect spillage of pollutants. e) The EAP hereby confirms that high level (based on the level of detail available at the time) management plans will form part of the standard EMPr prepared in accordance with Appendix 4 of the NEMA EIA Regulations, 2014 as amended.

Comments	Stakeholder/I&AP	Response
o A cumulative impact environmental statement on whether the proposed development must proceed. 8. Environmental Management Programme a) It is drawn to your attention that for substation and overhead electricity transmission and distribution infrastructure, when such facilities trigger activity 11 or 47 of the Environmental Impact Assessment Regulations Listing Notice 1 of 2014, as amended, and any other listed and specified activities necessary for the realisation of such facilities, the generic Environmental Management Programme, must be used and submitted with the final report over and above the EMPr for the facility. b) There needs to be an EMPr for the facility, the onsite substation as well as the power line, for whichever alternative is chosen. c) Further to the above, you are required to comply with the content of the EMPr in terms of Appendix 4 of the Environmental Impact Assessment Regulations, 2014, as amended. d) The EMPr must consider the following, and where possible, include: i. An alien invasive management plan to be implemented during construction and operation of the facility. The plan must include mitigation measures to reduce the invasion of alien species and ensure that the continuous monitoring and removal of alien species is undertaken. ii. A plant rescue and protection plan which allows for the maximum transplant of conservation important		We appreciate your engagement as a key stakeholder on this project and look forward to further engagement on this project.

Comments	Stakeholder/I&AP	Response
species from areas to be transformed. This plan must be compiled by a vegetation specialist familiar with the site and be implemented prior to commencement of the construction phase. iii. An avifauna monitoring and management plan to be implemented during the construction and operation of the facility. This plan must be drafted by a suitably qualified avifauna specialist. iv. A re-vegetation and habitat rehabilitation plan to be implemented during the construction and operation of the facility. Restoration must be undertaken as soon as possible after completion of construction activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats. v. An open space management plan to be implemented during the construction and operation of the facility. vi. A traffic management plan for the site access roads to ensure that no hazards would result from the increased truck traffic and that traffic flow would not be adversely impacted. This plan must include measures to minimize impacts on local commuters e.g. limiting		

Comments	Stakeholder/I&AP	Response
construction vehicles travelling on public roadways during the morning and late afternoon commute time and avoid using roads through densely populated built-up areas so as not to disturb existing retail and commercial operations. vii. A transportation plan for the transport of components, main assembly cranes and other large pieces of equipment. viii. A storm water management plan must be implemented during the construction and operation of the facility. The plan must ensure compliance with applicable regulations and prevent offsite migration of contaminated storm water or increased soil erosion. The 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. Drainage measures must promote the dissipation of storm water run-off. ix. A fire management plan must be implemented during the construction and operation of the facility. x. An erosion management plan for monitoring and rehabilitating erosion events associated with the facility. Appropriate erosion mitigation must		

Comments	Stakeholder/I&AP	Response
form part of this plan to prevent and reduce the risk of any potential erosion. xi. An effective monitoring system to detect any leakage or spillage of all hazardous substances during their transportation, handling, use and storage. This must include precautionary measures to limit the possibility of oil and other toxic liquids from entering the soil or storm water systems. xii. Measures to protect hydrological features such as streams, rivers, pans, wetlands, dams and their catchments, and other environmental sensitive areas from construction impacts including the direct or indirect spillage of pollutants. e) The EAP must provide detailed motivation if any of the above requirements is not required by the proposed development and not included in the EMPr. General You are further reminded to comply with Regulation 21(1) of the NEMA EIA Regulations 2014, as amended, which states that: *"If S&EIR must be applied to an application, the applicant must, within 44 days of receipt of the application by the competent authority, submit to the competent authority a SR which has 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"*		

Comments	Stakeholder/I&AP	Response
You are further reminded that the final SR to be submitted to this Department must comply with all the requirements in terms of the scope of assessment and content of SRs in accordance with Appendix 2 and Regulation 21(1) of the NEMA EIA Regulations 2014, as amended. Further note that in terms of Regulation 45 of the NEMA EIA Regulations 2014, as amended, this application will lapse if the applicant fails to meet any of the timeframes prescribed in terms of these Regulations, unless an extension has been granted in terms of Regulation 3(7). You are hereby reminded of Section 24F of the National Environmental Management Act, Act No. 107 of 1998, as amended, that no activity may commence prior to an Environmental Authorisation being granted by the Department.		

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17 APPENDIX E | SPECIALIST IMPACT ASSESSMENT REPORTS

PLEASE FIND THE SPECIALIST REPORTS HERE WITHIN

17.1 AGRICULTURAL IMPACT ASSESSMENT

17.2 AQUATIC IMPACT ASSESSMENT

17.3 AVIFAUNAL IMPACT ASSESSMENT

17.4 BAT IMPACT ASSESSMENT

17.5 HERITAGE (ARCHAEOLOGICAL) IMPACT ASSESSMENT

17.6 NOISE IMPACT ASSESSMENT

17.7 PALEONTOLOGICAL IMPACT ASSESSMENT

17.8 RIVERINE RABBIT IMPACT ASSESSMENT

17.9 SOCIO-ECONOMIC IMPACT ASSESSMENT

17.10 TERRESTRIAL BIODIVERSITY IMPACT ASSESSMENT

17.11 VISUAL IMPACT ASSESSMENT

17.12 WAKE EFFECT STUDY

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18 APPENDIX F | SPECIALIST DECLARATIONS

PLEASE FIND THE SPECIALIST DECLARATIONS HERE WITHIN

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19 APPENDIX G | ENVIRONMENTAL MANAGEMENT PROGRAMMES (EMPRS)

PLEASE FIND THE ENVIRONMENTAL MANAGEMENT PROGRAMMES HERE WITHIN

19.1 APPENDIX 4 EMPR (GENERAL WEF SITE)

19.2 GENERIC EMPR (SUBSTATIONS)

19.3 GENERIC EMPR (POWERLINES) (NOT APPLICABLE TO THIS APPLICATION)

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20 APPENDIX H | FULL IMPACTS TABLES

PLEASE FIND THE ENVIRONMENTAL MANAGEMENT PROGRAMMES HERE WITHIN

20.1 GENERAL IMPACTS TABLE

20.2 SPECIALIST IMPACTS TABLE

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