RIETKLOOF WIND FARM (PTY) LTD

PROPOSED RIETKLOOF WIND ENERGY FACILITY, WESTERN CAPE, SOUTH AFRICA (REF: 14/12/16/3/3/1/1977/AM1)

AMENDED ENVIRONMENTAL MANAGEMENT PROGRAMME

09 DECEMBER 2021

DFFE REFERENCE NUMBER:14/12/16/3/3/1/1977/AM1

PROPOSED RIETKLOOF WIND ENERGY FACILITY, WESTERN CAPE, SOUTH AFRICA (REF: 14/12/16/3/3/1/1977/AM1)

AMENDED ENVIRONMENTAL MANAGEMENT PROGRAMME

RIETKLOOF WIND FARM (PTY) LTD

TYPE OF DOCUMENT (VERSION)
PUBLIC

PROJECT NO.: 41103473
DATE: DECEMBER 2021

WSP
BUILDING C, KNIGHTSBRIDGE
33 SLOANE STREET
BRYANSTON, 2191
SOUTH AFRICA

T: +27 11 361 1380
F: +086 606 7121
WSP.COM

QUALITY MANAGEMENT[1]

ISSUE/REVISION	FIRST ISSUE	REVISION 1	REVISION 2	REVISION 3
Remarks	Draft EMPr	EMPr for submission to DEA	Amended EMPr – Public Review	
Date	September 2018	February 2019	November 2021	
Prepared by	Bronwyn Fisher	Bronwyn Fisher	Babalwa Mqokeli	
Signature	-	-	 Mqokeli, Babalwa (ZABM04722) 2021.12.06 19:55:16 +02'00'	
Checked by	Ashlea Strong	Ashlea Strong	Ashlea Strong	
Signature	-	-	 Digitally signed by Strong, Ashlea (ZAAS02685) DN: cn=Strong, Ashlea (ZAAS02685), ou=Active, email=Ashlea.Strong@wsp.com Date: 2021.12.07 06:02:27 +02'00'	
Authorised by	Ashlea Strong	Ashlea Strong	Ashlea Strong	
Signature	-	-	 Digitally signed by Strong, Ashlea (ZAAS02685) DN: cn=Strong, Ashlea (ZAAS02685), ou=Active, email=Ashlea.Strong@wsp.com Date: 2021.12.07 06:03:23 +02'00'	
Project number	41101022	41101022	41103473	
Report number	1	2	3	
File reference	file:///W:\000 NEW Projects\41101022 - Rietkloof 147MW WEF BAR\42 ES\2-REPORTS\03-EMPr\		Y:\Projects\41100xxx\41103473 - G7 energy - Euronotus Cluster\41 ES\01-Reports\04-EMPr	

[1] Please note that this is an internal quality control mechanism where reports are internally reviewed by at least one other senior staff member and then authorised for release to external sources.

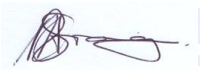
SIGNATURES

PREPARED BY

Mqokeli, Babalwa (ZABM04722) 2021.12.06 19:57:00 +02'00'

Babalwa Mqokeli
Senior Consultant

REVIEWED BY



Digitally signed by Strong, Ashlea (ZAAS02685)
DN: cn=Strong, Ashlea (ZAAS02685), ou=Active, email=Ashlea.Strong@wsp.com
Date: 2021.12.07 06:03:36 +02'00'

Ashlea Strong
Principal Consultant

This Amended Environmental Management Programme report (Report) has been prepared by WSP Group Africa Proprietary Limited (WSP) on behalf and at the request of Rietkloof Wind Farm (Pty) Ltd (Client), to provide the Client with an understanding of the mitigation measures required for the proposed project.

Unless otherwise agreed by us in writing, we do not accept responsibility or legal liability to any person other than the Client for the contents of, or any omissions from, this Report.

To prepare this Report, we have reviewed only the documents and information provided to us by the Client or any third parties directed to provide information and documents to us by the Client. We have not reviewed any other documents in relation to this Report, except where otherwise indicated in the Report.

PRODUCTION TEAM

CLIENT – RIETKLOOF WIND FARM (RF) (PTY) LTD

Head of Environmental, Social & Governance	Magdalena Logan
Environmental & Social Developer	Janine Brasington

WSP

Principal Consultant	Ashlea Strong
Senior Environmental Consultant	Babalwa Mqokeli

SUBCONSULTANTS (2019)

Agricultural and Soil Specialist	EOH Coastal and Environmental Services, Mr Roy de Kock
Aquatic Specialist	Sherman Colloty & Associates, Mr Brian Colloty
Biodiversity Specialist	3Foxes Biodiversity Solutions, Mr Simon Todd
Avifaunal Specialist	Mr Vincent Ward and Dr Tony Williams from African Insights
Bat Specialist	Animalia, Mr Werner Marais
Heritage Specialist	Booth Heritage Consulting, Ms Celeste Booth
Noise Specialist	SafeTech, Dr Brett Williams
Palaeontology Specialist	Natura Viva, Dr John Almond
Social Specialist	Mr Tony Barbour
Traffic Specialist	Aurecon South Africa, Mr Hermanus Steyn
Visual Specialist	EOH Coastal and Environmental Services, Mr Michael Johnson

SUBCONSULTANTS (2021)

Agricultural and Soil Specialist	Johan Lanz
Terrestrial Ecology & Biodiversity	Trusted Partners, Janie Pote and Malcome Logie
Aquatic Specialist	Freshwater Ecologist Network (FEN) Consulting (Pty) Ltd, Christel du Preez
Avifaunal Specialist	Birds and Bats Unlimited, Dr Rob Simmons
Bat Specialist	Animalia Consultants, Werner Marais
Heritage Specialist	CTS Heritage, Nicholas Wiltshire

Noise Specialist	SafeTech, Dr Brett Williams
Palaeontology Specialist	Natura Viva, Dr John Almond
Social Specialist	Mr Tony Barbour and Schalk van der Merwe
Traffic Specialist	JG Afrika, Avheani Ramawa
Visual Specialist	SiVEST SA, Kerry Schwartz

ABRREVIATIONS

BA	Basic Assessment
BAR	Basic Assessment Report
BSP	Biodiversity Spatial Plan
CMP	Conservation Management Plan[2]
DEA	Department of Environmental Affairs
DoE	Department of Energy
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMF	Environmental Management Frameworks
EMPr	Environmental Management Programme
EO	Environmental Officer
ESMS	Environmental and Social Management System
GHG	Greenhouse Gases
GNR	Government Notice Regulation
GNR	Government Notice Regulation
I&APs	Interested and Affected Parties
IDP	Integrated Development Plans

[2] It must be noted that the Part 2 Amendment Application recently submitted for the Rietkloof WEF (Ref: 14/12/16/3/3/1/1977/AM1) requests the removal of this requirement from the EA and subsequently the EMPr.

IFC	International Finance Corporation
IPP	Independent Power Producer
IRP	Integrated Resource Plan
MW	Megawatt
NDP	National Development Plan
NEMA	National Environmental Management Act (No. 107 of 1998)
NPAES	National Protected Areas Expansion Strategy
PS	Performance Standards
REDZ	Renewable Energy Development Zone
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
S&EIA	Scoping and Environmental Impact Assessment
SDF	Spatial Development Frameworks
SEA	Strategic Environmental Assessments
SIP	Strategic Infrastructure Plan
UNFCCC	United Nations Framework Convention on Climate Change
WEF	Wind Energy Facility

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1 INTRODUCTION

1.1 BACKGROUND

Rietkloof Wind Farm (RF) (Pty) Ltd (Rietkloof) proposes to develop the 183 megawatt (MW) Rietkloof Wind Energy Facility (WEF), located near Laingsburg, in the Western Cape Province, South Africa. The proposed project formed part of the Fifth Bid Window submissions under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP). **The Rietkloof WEF has been confirmed a Round 5 Preferred Bidder Project and is a confirmed Strategic Infrastructure Project in terms of the Infrastructure Development Act 9 (Act No.23 of 2014).**

Rietkloof initiated project planning in 2009 commencing with monitoring of wind in the area and securing land rights. In 2016 Rietkloof appointed EOH Coastal and Environmental Services (Pty) Ltd (EOH) to facilitate the Scoping and Environmental Impact Assessment (S&EIA) process for the construction and operation of the Rietkloof WEF, including 70 wind turbines. During the EIA phase it was identified that a number of turbines were located in ecologically sensitive areas and the layout was revised and the number of turbines reduced to 60. The Final Environmental Impact Assessment Report (EIAR) was submitted to the Department of Environmental Affairs (DEA – now known as the Department of Forestry, Fisheries and the Environment - DFFE) in September 2016. In November 2016 the DEA (now known as the DFFE) issued the Environmental Authorisation (EA) (Ref: 15/12/16/3/3/2/899), however, the authorisation only authorised 9 of the proposed 60 turbines. As per the reasons for decision outlined in Annexure 1, Section 3(f) of the EA, the DEA did not support the development within the Western Karoo National Protected Areas Expansion Strategy (NPAES) and the impacts to critical biodiversity areas were deemed to be high. As such only 9 of the 60 turbines were authorised, amounting to an output capacity of 36MW. An appeal of the EA decision was submitted by the applicant, and a final decision was issued by the DFFE on 11 November 2017 and the appeal was dismissed and the issued EA upheld.

Subsequently, SANBI amended and reduced the critical biodiversity areas (SANBI, 2017) and the South African government furthermore gazetted[3] eight areas earmarked for renewable energy development in South Africa. These areas are known as Renewable Energy Development Zones (REDZ) and the proposed Rietkloof WEF falls within the Komsberg REDZ. Rietkloof furthermore relooked at alternative ways to reduce the ecological impact to an acceptable level through the agricultural conservation area of a minimum of 4000 ha., The remaining Rietkloof WEF (51 turbines) were approved by the issuance of an EA dated 10 April 2019 (Ref: 14/12/16/3/3/1/1977). The EA authorised up to 51 turbines of a maximum generating capacity of 174MW in total, with a hub height of 125m and the rotor diameter of 160m. A subsequent administrative amendment to the EA was issued on 09 May 2019.

The Appeals Directorate received an appeal on behalf of six appellants, against the decision of the Department to grant the 2019 EA to the applicant. An appeal decision was issued on 16 July 2019, which dismissed the appeal by the appellants, and the granting of the 2019 EA was confirmed.

However, as part of the appeal response, the Department was directed to merge the 2016 and 2019 EAs, in order to remove specific conditions that did not allow for the positioning of the now authorised 51 turbines (section 2.4.5 of the decision). Subsequent to the appeal decision issued in July 2019, the two EAs (issued on 23 November 2016 and 10 April 2019) were successfully merged on 16 September 2019 and assigned a combined Reference 14/12/16/3/3/1/1977/AM1. This EA authorises up to 60 (sixty) wind turbines of a maximum generating capacity of 183MW in total, with a hub height of up to120m (original 09 turbines) and 125m (additional 51 turbines); and the rotor diameter of up to 140m (original 09 turbines) and 160m (additional 51 turbines).

In terms of the merged EA issued in September 2019. the Environmental Management Programme (EMPr) for the proposed Rietkloof WEF requires approval from the DFFE prior to Financial Close and commencement of construction, to ensure compliance with the EA. Condition 12 of the EA for the proposed Rietkloof WEF requires that:

[3] Government Notice 114 of 16 February 2018.

"*The Environmental Management Programme submitted as part of the Application for EA must be amended and submitted to the Department for written approval prior to commencement of the activity. The recommendations and mitigation measures recorded in the BAR dated 11 February 2019 must be incorporated as part of the EMPr. The EMPr must be inclusive of the final Conservation Management Plan*[4]*. Once approved, the EMPr must be implemented and adhered to.*"

Therefore, this EMPr (this Report) is an update of the February 2019 EMPr. This EMPr is updated to include, but not limited to, requirements as contained in the conditions of the EA, the final development layout and the required final Conservation Management Plan. This EMPr is being made available to Organs of State and Interested and Affected Parties (I&APs) for a 30-day comment period from **9 December 2021 to 31 January 2022**. Thereafter, this EMPr, inclusive of Stakeholder comments, final development layout and final Conservation Management Plan will be submitted to the DFFE as per the requirements of Condition 12 of the EA.

It must be noted that subsequent to the merged EA issued and during the final layout development and preliminary design and micro-siting, several amendments have been proposed for the Rietkloof WEF project. This includes reducing the number of turbine positions from the authorised 60 to 47, the increase of the rotor diameter to 180m and the hub height to 125m for all turbines, as well as some administrative amendments. The Amendment Application was submitted to the DFFE on **9 December 2021** and will run in parallel with the EMPr and layout approval process. It must be noted that this amended EMPr has taken the new proposed amendments into account.

It must be noted that the layout included in the final EMPr is considered a worst-case final layout with 47 turbines. It is however likely that once the turbine manufacturer has been confirmed, the layout will drop to a maximum of 34 turbines which will also allow for the micro-siting / removal of the turbines identified by the Bat specialist (i.e. R27, R37 and R49).

1.2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

WSP Environmental (Pty) Ltd (now WSP Group Africa (Pty) Ltd) (WSP) was the appointed Independent Environmental Assessment Practitioner (EAP) to undertake the BA Process, including the original EMPr compiled in 2019, for the proposed Rietkloof WEF. The updates to the EMPr (this Report) have been compiled by the EAP, Babalwa Mqokeli, under the employ of WSP. **Table 1-1** outlines the details of the EAP and their expertise. The CV's of the project director and project manager are available in **Appendix A**.

Table 1-1: Details and Expertise of the EAP

EAP: WSP GROUP AFRICA (PTY) LTD	
Contact Person:	Babalwa Mqokeli
Physical Address	1st Floor, Pharos House, 70 Buckingham Terrace, Westville Durban, 3629
Telephone:	031 240 8804
Fax:	031 240 8804
E-mail:	Babalwa.mqokeli@wsp.com
Years' Experience	6
Qualifications	MSc Ecological Science, University of KwaZulu-Natal
Professional Registration	SACNASP (Pr. Sci. Nat. – Reg. No. 009863 - Environmental Science)

[4] It must be noted that the Part 2 Amendment Application recently submitted for the Rietkloof WEF (Ref: 14/12/16/3/3/1/1977/AM1) requests the removal of this requirement from the EA and subsequently the EMPr.

EAP: WSP GROUP AFRICA (PTY) LTD	
EAP Expertise	Babalwa has 6 years of experience in environmental assessment and management, and over 1 years of experience as an ecological scientist intern. She is a registered Professional Natural Scientist (Pr. Sci. Nat.) in Environmental Science (Reg. No: 009863) with the South African Council of Natural Scientific Professions. Babalwa has experience in the management and integration of various types of environmental assessments, including the mining, industrial, agricultural and renewable energy sector. Her experience includes environmental screening mapping using ArcGIS. She has also been part of the team undertaking the National Wind and Solar Strategic Environmental Assessment work.

1.3 ENVIRONMENTAL MANAGEMENT PROGRAMME STRUCTURE

Table 1-2 cross-references the sections within the Environmental Management Programme (EMPr) with the legislated requirements as per Appendix 4 of Government Notice Regulation (GNR) 982 (as amended).

Table 1-2: Legislation Requirements as detailed in Appendix 4 of GNR 982 (as amended)

APPENDIX 4	LEGISLATED REQUIREMENTS AS PER THE NEMA GNR 982 (AS AMENDED)	RELEVANT REPORT SECTION
(a)	details of-	
	(i) the EAP who prepared the EMPr; and	Section 1.1
	(ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	**Appendix A**
(b)	a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 3.3
(c)	a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Section 3 and **Appendix B**
(d)	A description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-	Section **Error! Reference source not found.**
	(i) planning and design;	
	(ii) pre-construction activities;	
	(iii) construction activities;	
	(iv) rehabilitation of the environment after construction and where applicable post closure; and	
	(v) where relevant, operation activities;	

APPENDIX 4	LEGISLATED REQUIREMENTS AS PER THE NEMA GNR 982 (AS AMENDED)	RELEVANT REPORT SECTION
(f)	a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to -	Section 8
	(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	
	(ii) comply with any prescribed environmental management standards or practices;	
	(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and	
	(iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable	
(g)	the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 8
(h)	the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 8
(i)	an indication of the persons who will be responsible for the implementation of the impact management actions;	Section 8
(j)	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 8
(k)	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 7, Section 8, Section 9
(l)	a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations	Section 7.5
(m)	an environmental awareness plan describing the manner in which-	Section 7.2
	(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and	
	(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	
(n)	any specific information that may be required by the competent authority	Information requested by the DEA in comments dated 16 January 2019 has been included in throughout this report. all amendments to this report have been underlined for ease of reference.

1.4 CONDITIONS OUTLINED IN ENVIRONMENTAL AUTHORISATION

For the purposes of demonstrating adherence to the requirements of the EA for the proposed Rietkloof WEF, **Table 1-3** cross references the sections within this updated EMPr Report as per the applicable EA conditions and DFFE requirements.

Table 1-3: Requirements as detailed in the Conditions of the EA (Ref Number: 14/12/16/3/3/1/1977)

NO.	CONDITION [PARAPHRASED]	ACTION
11	A copy of the final development layout map must be made available for comments by registered Interested and Affected Parties and the holder of this environmental authorisation must consider such comments. Once amended, the final development layout map must be submitted to the Department for written approval prior to commencement of the activity. 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 : 14.1 Cable routes (where they are not along internal roads) 14.2 Position of wind turbines and associated infrastructure 14.3 The location of the turbines that were removed as per condition 36, 37, and 42 of this EA 14.4 Internal roads indicating width 14.5 Wetlands, drainage lines, rivers, stream and water crossing of roads and cables 14.6 All sensitive features e.g. Critical Biodiversity Areas, Ecological Support Areas, heritage sites, wetlands, pans and drainage channels that will be affected by the facility and associated infrastructure 14.7 Substation(s) inverters and/or transformer(s) sites including their entire footprint 14.8 Connection routes (including pylon positions) to the distribution/transmission network 14.9 All existing infrastructure on the site, such as roads 14.10 Soil heaps (temporary for topsoil and subsoil and permanetly for excess material 14.11 Building, including accommodation; and 14.12 All “no-go” and buffer areas	As part of the finalisation of the EMPr a final development layout (compliant with the requirements of this condition) has been compiled and is included in Chapter 3 (**Figure 3-4**) and **Appendix B** of this EMPr. This EMPr and final development layout map is being released for a 30-day comment period (**9 December 2021 to 31 January 2022**), and comments received from I&APs will be incorporated into the Final EMPr for submission to the Department in order to comply with this condition.
12	Furthermore, a shapefile of the approved development layout/footprint must be submitted to this Department within two months from the date of this decision. The shapefile must be created using the Hartebeesthoek 94 Datum and the data should be in Decimal Degree Format using the W63 84 Spheroid. The shapefile must include at a minimum the following extensions i.e. .shp; .shx;	A shapefile of the approved final development layout, developed as part of this EMPr update, will be submitted to the Department as required post approval of this EMPr and final layout.

NO.	CONDITION [PARAPHRASED]	ACTION
	.dbf; .prj; and, .xml (Metadata file). If specific symbology was assigned to the file, then the .avl and/or the .lyr file must also be included. Data must be mapped at a scale of 1:10 000 (please specify if an alternative scale was used). The metadata must include a description of the base data used for digitizing. The shapefile must be submitted in a zip file using the EIA application reference number as the title. The shape file must be submitted to: Postal Address: Department of Environmental Affairs Private Bag X447 Pretoria 0001 Physical address: Department of Environmental Affairs Environment House 473 Steve Biko Arcadia Pretoria For Attention: Mr Muhammad Essop Integrated Environmental Authorisations Strategic Infrastructure Developments Telephone Number: (012) 399 9406 Email Address: MEssop@environment.gov.za	
13	The Environmental Management Programme (EMPr) submitted as part of the EIAr and BAR is not approved and must be amended to include measures as dictated by the final site lay-out map and micro-siting, and the provisions of this environmental authorisation. Registered interested and Affected Parties and the holder of this environmental authorisation must consider such comments. Once amended, the final EMPr must be submitted to the Department for written approval prior to commencement of the activity. Once approved the EMPr must be implemented and adhered to.	WSP has been commissioned to update the EMPr (compliant with the requirements of this condition) which will also be subject to review by I&APs for a period of 30 days (**9 December 2021 to 31 January 2022**) prior to being submitted to the DFFE for approval. Relevant specialists were commissioned, where recommendation measures proposed by the specialists have been included accordingly in the relevant sections.
14	The EMPr amendment must include the following :	
14.1.	The final site layout map.	This EMPr has been amended to include the final layout (**Figure 3-4**) and **Appendix B**. The environmental sensitivities identified during the BA phase, informed by specialist assessments, as well as those identified during the specialist walkdown, were used to inform the final site layout developed in this EMPr.

NO.	CONDITION [PARAPHRASED]	ACTION
14.2.	The Final Conservation Management Plan.[5]	Section 8.6.4 contains the conservation management plan compiled for this project. The removal of this condition is subject to the Part 2 Amendment Application Process which is running parallel with the approval of this final EMPr.
14.3.	An Alien Invasive Management Plan.	An alien and invasive management plan is included in Section 9.1 of this EMPr.
14.4.	A Plant Rescue and Protection Plan.	A Plant Rescue and Protection Plan is included in Section 9.2 of this EMPr.
14.5.	A Re-vegetation and Habitat Rehabilitation Plan.	A re-vegetation and habitat rehabilitation plan is included in Section 9.3 of this EMPr.
14.6.	A Traffic Management Plan.	**Appendix C** contains the traffic and transport management plans.
14.7.	A construction and operational avifauna and bat monitoring plan.	The construction and operational avifauna and bat monitoring plans are contained in **Appendix D** and **Appendix E** respectively.
14.8.	A Conservation Management Plan.	It is assumed that this is in reference to a Heritage Conservation Management Plan and not a duplicate of the Final Conservation Management Plan required in Condition 14.2 above, **Appendix F** contains the Heritage Conservation Management Plan compiled for this project.
14.9.	A Storm Water Management Plan.	A conceptual stormwater management plan (SWMP) is outlined in Section 9.5 of this EMPr and will be updated and/or built into the detailed engineering design SWMP.
14.10.	An Erosion Management Plan.	An erosion management plan is included in Section 9.6 of this EMPr.
14.11.	A Rehabilitation Management Plan.	This plan forms part of the re-vegetation and habitat rehabilitation plan included in Section 9.3 of this EMPr.
14.12.	A fire management plan.	A fire management plan is included in Section 9.7 of this EMPr.
14.13.	Measures to protect hydrological features.	Measures to protect hydrological features and sensitive areas is included are contained in the relevant aspects in section 8, as well as Section 9.8 of this EMPr.

[5] It must be noted that the Part 2 Amendment Application recently submitted for the Rietkloof WEF (Ref: 14/12/16/3/3/1/1977/AM1) requests the removal of this requirement from the EA and subsequently the EMPr.

NO.	CONDITION [PARAPHRASED]	ACTION
14.14.	A Health and Safety Programme.	Consideration of a Health and safety Programme is included in Section 9.9.
14.16.	An effective monitoring system to detect any leakage or spillage of all hazardous substances during their transportation, handling, use and storage.	A hazardous substances leakage or spillage monitoring system is included in Section 9.10 of this EMPr.
14.17.	A map combining the final layout map superimposed (overlain) on the environmental sensitivity map.	Refer to **Figure 5-2** and **Figure 5-3** and **Appendix B** of this EMPr for an environmental sensitivity map compiled during the BA process. Refer to Figure 5-2 (Section 5) of this EMPr for a map combining the final layout map overlain onto the environmental sensitivity map. This map reflects amended turbine positions amended post the EA in developing the final layout map.
32	The remaining approved turbines must avoid all areas designated as "no-go" areas as well as their buffers	These are noted and have been complied with. Compliance is demonstrated within the final layout plan, overlain over an environmental sensitivities map. Refer to **Figure 5-2** and **Figure 5-3** and **Appendix B** of this EMPr.
33	The final placement of turbines must follow a micro siting procedure involving a walk-through and identification of any sensitive areas by botanical, avifaunal and bats specialists	
34	Exclusion of sensitive ecological, heritage and paleontological areas from construction activities must inform micro siting of all development activities.	
35	Should any occupied farm buildings be affected by shadow flicker, the holder of this Environmental Authorisation must provide mitigation measures to reduce the impact to an acceptable level as advised by a suitably qualified specialist.	
36	The location of the construction camp, as well as the internal substation must be relocated and placed in proximity to turbine 31 and turbine 32.	
37	A 1.5km buffer must be applied to the Verreaux's Eagle nest and the Dassie colony.	
38	The farm track that runs between the Verreaux's Eagle nest and the Dassie colony must be avoided.	
39	A construction and operational avifauna and bat monitoring plan must be developed and implemented 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.	Birds and Bats Unlimited (Avifauna Specialist) and Animalia Consultants (Bat Specialist) were commissioned to design a construction and operational avifauna and bat monitoring plan in line with this condition (see **Appendix D** and **Appendix E** respectively).
40	As an absolute minimum, bird and bat monitoring, must occur at least 6 months pre-construction, continue during	This is noted and has been complied with.

NO.	CONDITION [PARAPHRASED]	ACTION
	the construction period, and continue for at least three years during the operation of the facility. The results of this monitoring must be made available to the DEA, Birdlife South Africa (BLSA) and the South African Bat Assessment Advisory Panel (SABAAP) and must further advise the EMPr where necessary.	6 months pre-construction monitoring has been undertaken with site visits in July and November 2021. A walkdown of the WEF was also undertaken, a summary of the findings is included in section 5.4 of this EMPr. The results of the walkdown and the pre-construction monitoring are included in **Appendix G**. Recommendations and measures of the of the 2016 study and 2021 specialist walkdown and pre-construction monitoring have been incorporated into this EMPr (Section 8). Compliance has also been demonstrated within the final layout plan, overlain over an environmental sensitivities map, contained in **Figure 5-2**of this EMPr.
41	The results of the pre-construction bird monitoring assessment including all recommendations proposed by the report dated September 2016, must inform the final layout and the construction schedule of the facility.	
46	A pre-construction walk through of the approved powerline alignment and turbine positions by a bat specialist, avifaunal specialist and ecologist, must be conducted to ensure that the micro-siting of the turbines, pylons and powerline alignments have the least possible impact, there are no nest sites of priority species on or close to the construction corridor and all protected plant species impacted are identified.	An avifauna specialist, Birds and Bats Unlimited; bat specialist (**Appendix G**), Animalia Consultants (**Appendix H**); and ecology specialist, Trusted Partners (**Appendix I**) were commissioned to complete the required pre-construction walk throughs. A summary of the findings of these specialist walkdowns is included in Section 5 of this EMPr.
47	The areas identified as 'very high' and 'no-go' sensitivity by the final mitigated biodiversity layout must be regarded as 'no-go' areas.	This is noted and has been complied with. Compliance is demonstrated within the final layout plan, overlain over an environmental sensitivities map (**Figure 5-2** and **Figure 5.3**).
48	No wind turbines are allowed in the NPAES priority areas.	This is noted and will be complied with. Compliance is demonstrated within the final layout plan, overlain over an environmental sensitivities map (**Figure 5-2** and **Figure 5.3**). It should be noted that the EA includes authorisation for listed activities 4, 12, 14 and 18 of Listing Notice 3 (GN 985, as amended)
49	All watercourses are regarded as sensitive. All developments within 500m of watercourses must comply with the National Water Act. Wetlands, rivers and river riparian areas must be treated as "no-go" areas and demarcated as such.	This is noted and will be complied with. A WULA application has been lodged with the DWS in order to comply with the National Water Act.
50	Relevant permits must be obtained from relevant authorities for any removal or destruction of Threatened or Protected Species (TOPs).	Where such permits are required, the EA holder commits to completing this in line with the condition requirements. The ecology walkdown recommended that a flora and fauna search and rescue (relocation) must be undertaken before commencement of vegetation clearing and should preferable be undertaken in the Spring season. . A comprehensive list of species for which permits will be required is provided in Appendix 1: Plant Species of Conservation Concern (Red listed) and Appendix 2: Flora Protected in Terms of Provincial of the Ordinance(s) of the Ecology & Biodiversity Walkdown Report (**Appendix I**).
51	Before the clearing of the site, the appropriate permits must be obtained from the Department of Agriculture, Forestry and Fisheries (DAFF) for the removal of plants listed in the National Forest Act and from the relevant provincial department for the destruction of species protected in terms of the Specific provincial legislation.	

NO.	CONDITION [PARAPHRASED]	ACTION
55	No activities will be allowed to encroach into a water resource without a Water Use License being in place from the Department of Water and Sanitation.	This is noted and will be complied with. A WULA application has been lodged with the DWS in order to comply with the National Water Act.
59	Where roads pass right next to major water bodies, provisions must be made for fauna such as toads to pass under the roads by using culverts or similar structures.	In the event that such an event occurs, the EA holder commits to completing this (in line with the condition requirements) pre-construction.
61	The final development area should be surveyed for species suitable for search and rescue, which should be trans-located prior to the commencement of construction.	Trusted Partners was commissioned to complete the required pre-construction walk through (see **Appendix I**).
69	A plant rescue and protection plan which allows for the maximum transplant of conservation important species from areas to be transformed must be compiled.	A plant rescue and protection plan has been compiled, and is informed by the findings and identified listed and protected species and recommendations included in the Ecology & Biodiversity Walkdown undertaken for this project. Refer to Section 9.2 of this EMPr for this information..
71	A storm water management plan to be implemented during the construction and operation of the facility must be compiled.	A conceptual stormwater management plan (SWMP) is outlined in Section 9.5 of this EMPr and will be updated and/or built into the detailed engineering design SWMP.
72	An erosion management plan for monitoring and rehabilitating erosion events associated with the facility must be compiled.	An erosion management plan is included in Section 9.6 of this EMPr.
74	The southern access road to the site is not approved.	This is noted and will be complied with. Compliance will be demonstrated within the final layout plan, overlain over an environmental sensitivities map (**Figure 5-2** and **Figure 5.3**)
75	Existing road infrastructure must be used as far as possible for providing access to the proposed turbine positions. Where no road infrastructure exists, new roads must be placed within existing disturbed areas or environmental conditions must be taken into account to ensure that minimum amount of damage is caused to natural habitats.	This is noted and included as a measure in this EMPr for consideration and/or implementation.
76	Internal access roads must be located to minimize stream crossings. All structures crossing streams must be located and constructed such that they do not decrease channel stability or increase water velocity.	This is noted and included as a measure in this EMPr for implementation. A WULA application has been lodged with the DWS in order to comply with the National Water Act.
82	A traffic management plan for the site access roads must be compiled.	**Appendix C** contains the traffic and transport management plans compiled as part of the EMPr update.
83	The potential noise impact must be re-evaluated should the layout be changed such that any wind turbines are located closer than 1,000m from a confirmed noise sensitive area.	This is noted and will be complied with. Compliance will be demonstrated within the final layout plan (**Figure 3-4**)

NO.	CONDITION [PARAPHRASED]	ACTION
88	Positions of turbines jeopardizing compliance with accepted noise levels must be revised during the micro-siting of the units in question and predicted noise levels re-modelled by the noise specialist, in order to ensure that the predicted noise levels are less than 45dB(A).	
94	The South African Astronomical Observatory, Southern African Largest Telescope, and the South African Civil Aviation Authority must be provided an opportunity to review and provide comment on the use of lighting on the development footprint. The comments must be incorporated into the EMPr.	These stakeholders will be provided an opportunity to review and comment upon the updated EMPr in this regard. All comments received will be incorporated into the final EMPr.
115	An integrated waste management approach must be implemented that is based on waste minimisation and must incorporate reduction, recycling and re-use options where appropriate.	This is noted. An integrated waste management plan forms part of the updated EMPr (Section 9.11).
117	Underground cables and internal access roads must be aligned as much as possible along existing infrastructure to limit damage to vegetation and watercourses.	This is noted and will be complied with. Compliance will be demonstrated within the final layout plan, overlain over an environmental sensitivities map (**Figure 5-2** and **Figure 5.3**).
124	A 60m buffer must be applied around all identified archaeological sites.	The heritage walkdown report (**Appendix J**) states that the final layout for the Rietkloof WEF avoids impact to all known significant heritage resources present within the development area.
125	Pre-construction archaeological monitoring is required. The appointed archaeologist must keep a list documenting all identified farm infrastructure.	A more detailed archaeological assessment of the final layout of the proposed Rietkloof WEF project was conducted by CTS Heritage (Cultural Heritage Specialist) (**Appendix J**). The heritage report compile documents a list of archaeological and built environment observations noted during the walk down for the WEF and associated infrastructure.
127	Construction managers/foremen must be informed before construction starts of the possible types of heritage sites and cultural material that may be encountered and the procedures to follow when they find sites.	The EA holder commits to such education, which will be completed in full compliance with recommendations from the specialist reports and EMPr.
128	All buffers and no-go areas stipulated in the EIAr must be adhered to for both the facilities and all roads and powerlines.	This is noted and will be complied with. Compliance is demonstrated within the final layout plan, overlain over an environmental sensitivities map (**Figure 5-2** and **Figure 5.3**).
131	The final layout must be shown to the appointed archaeologist before implementation to confirm that all significant heritage resources have been adequately protected.	A more detailed archaeological assessment of the final layout of the proposed WEF project was conducted by CTS Heritage (**Appendix J**).
132	A conservation management plan must be drafted and submitted to SAHRA for review and comment.	A heritage conservation management plan (**Appendix F)** was compiled as part of the EMPr update and will be submitted to SAHRA as required.

NO.	CONDITION [PARAPHRASED]	ACTION
133	All wind turbines must avoid all areas designated as "no-go" areas as well as their buffers.	This is noted and will be complied with. Compliance is demonstrated within the final layout plan, overlain over an environmental sensitivities map (**Figure 5-2** and **Figure 5.3**).
134	No transmission line towers, substations and construction camps must be placed within the delineated water courses as well as their respective buffers without obtaining the required approvals.	This is noted and will be complied with. Compliance is demonstrated within the final layout plan, overlain over an environmental sensitivities map (**Figure 5-2** and **Figure 5.3**).
135	Rietkloof must engage with Cape Nature and provide them with the opportunity to provide input to the final Conservation Management Plan, which must be submitted to the DEA along with the final EMPr for approval, prior to the commencement of construction.	Cape Nature will be provided an opportunity to review and comment upon the updated EMPr (including Conservation Management Plan). All comments received will be incorporated into the final EMPr. The removal of this condition is subject to the Part 2 Amendment Application Process which is running parallel with the approval of this final EMPr.
137	The final placement of turbines must follow a micro siting procedure involving a walk-through and identification of any sensitive areas by ecological, avifaunal, bat, surface water and heritage specialists.	This is noted and will be complied with. Compliance will be demonstrated within the final layout plan, overlain over an environmental sensitivities map (**Figure 5-2** and **Figure 5.3**). The final layout map was assessed by the relevant specialists to determine sensitivities associated with the turbine positions (see Section 5).

1.5 APPLICABLE DOCUMENTATION

The following documents are to be read in conjunction with the EMPr:

- Draft and final Basic Assessment Report (BAR) for the proposed Rietkloof WEF;
- Merged EA date 16 September 2019 (Ref: 14/12/16/3/3/1/1977/AM1) in terms of the National Environmental Management Act (Act No. 107 of 1998) (NEMA);
- The Rietkloof Environmental and Social Management System (ESMS) (to be compiled prior to project commencement);
- Management Plans included in **Appendices C to F**; and
- Specialist walkdown input included in **Appendices G to O.**

2 ENVIRONMENTAL LEGAL FRAMEWORK

2.1 SOUTH AFRICAN REGULATORY FRAMEWORK

The national environmental legislation applicable to the proposed Rietkloof WEF includes, but is not limited, to the following:

- The Constitution of the Republic of South Africa (No. 108 of 1996);
- National Environmental Management Act (No. 107 of 1998) (as amended);
- National Environmental Management, Waste Act (No 59 of 2008);
- National Environmental Management, Air Quality Act (No 39 of 2004);
- National Environmental Management Biodiversity Act (No. 10 of 2004);
- Renewable Energy Development Zones (GN 114);
- The National Water Act, (No 36 of 1998);
- Occupational Health and Safety Act, (No 85 of 1993);
- National Heritage Resource Act (No. 25 of 1999);
- Civil Aviation Act (No 13 of 2009);
- Astronomy Geographic Act, 2007 (No. 21 of 2007);
- The Conservation of Agricultural Resources Act, (No 43 of 1983) (CARA); and
- Hazardous Substances Act (No. 15 of 1973).

2.2 INTERNATIONAL REGULATORY FRAMEWORK

The objectives and applicability of the eight International Finance Corporation (IFC) Performance Standards (PS) are detailed in **Table 2-1**.

Table 2-1: Objectives and Applicability of the IFC PS's

Reference	Requirements	Project Specific Applicability
Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts		
Performance Standard 1 underscores the importance of managing environmental and social performance throughout the life of a project. An effective Environmental and Social Management System (ESMS) is a dynamic and continuous process initiated and supported by management, and involves engagement between the client, its workers, local communities directly affected by the project (the Affected Communities) and, where appropriate, other stakeholders. **Objectives:** – To identify and evaluate environmental and social risks and impacts of the project. – To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, 5 and, where residual impacts remain, compensate/offset for risks and impacts to workers, Affected Communities, and the environment. – To promote improved environmental and social performance of clients through the effective use of management systems. – To ensure that grievances from Affected Communities and external communications from other stakeholders are responded to and managed appropriately. – To promote and provide means for adequate engagement with Affected Communities throughout the project cycle on issues that could potentially affect them and to ensure that relevant environmental and social information is disclosed and disseminated.		

Reference	Requirements	Project Specific Applicability
1.1	Policy	A formal ESMS will be compiled for the project prior to its commencement.
1.2	Identification of Risks and Impacts	
1.3	Management Programmes	
1.4	Organisational Capacity and Competency	
1.5	Emergency Preparedness and Response	
1.6	Monitoring and Review	
1.7	Stakeholder Engagement	
1.8	External Communication and Grievance Mechanism	
1.9	Ongoing Reporting to Affected Communities	
Performance Standard 2: Labour and Working Conditions;		
Performance Standard 2 recognises that the pursuit of economic growth through employment creation and income generation should be accompanied by protection of the fundamental rights of workers **Objectives:** – To promote the fair treatment, non-discrimination, and equal opportunity of workers. – To establish, maintain, and improve the worker-management relationship. – To promote compliance with national employment and labour laws. – To protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the client's supply chain. – To promote safe and healthy working conditions, and the health of workers. – To avoid the use of forced labour.		
2.1	– Working Conditions and Management of Worker Relationship – Human Resources Policy and Management – Working Conditions and terms of Engagement – Workers organisation – Non- Discrimination and Equal Opportunity – Retrenchment – Grievance Mechanism	A formal ESMS will be compiled for the project prior to its commencement. Human resource and labour policies will be included in the ESMS.
2.2	– Protecting the Workforce – Child Labour – Forced Labour	
2.3	Occupational health and Safety	
2.4	Workers Engaged by Third Parties	

Reference	Requirements	Project Specific Applicability
2.5	Supply Chain	
Performance Standard 3: Resource Efficiency and Pollution Prevention		
Performance Standard 3 recognises that increased economic activity and urbanisation often generate increased levels of pollution to air, water, and land, and consume finite resources in a manner that may threaten people and the environment at the local, regional, and global levels. There is also a growing global consensus that the current and projected atmospheric concentration of greenhouse gases (GHG) threatens the public health and welfare of current and future generations. At the same time, more efficient and effective resource use and pollution prevention and GHG emission avoidance and mitigation technologies and practices have become more accessible and achievable in virtually all parts of the world. **Objectives:** – To avoid or minimise adverse impacts on human health and the environment by avoiding or minimising pollution from project activities. – To promote more sustainable use of resources, including energy and water. – To reduce project-related GHG emissions.		
3.1	– Resource Efficiency – Greenhouse Gases – Water Consumption	The only applicable and material resource efficiency issue is water consumption due to the arid nature of the region and general propensity for drought conditions in the country. The project is not greenhouse gas (GHG) emissions intensive and the detailed assessment and reporting of emissions is not required. This project, however, seeks to facilitate resource efficiency and pollution prevention by contributing to the South African green economy.
3.2	– Pollution Prevention – Air Emissions – Stormwater – Waste Management – Hazardous Materials Management – Pesticide use and Management	Dust air pollution in the construction phase has been adequately addressed in the EMPr. The project will not result in the release of industrial effluents. Potential pollution associated with sanitary wastewater is low and mitigation measures have been included in the EMPr. Land contamination of the site from historical land use (i.e. low intensity agricultural / grazing) is not considered to be a cause for concern. The waste generation profile of the project is not complex. Waste mitigation and management measures have been included in EMPr. Hazardous materials are not a key issue; small quantities of construction materials (oil, grease, diesel fuel, cement etc.) and stored sanitary sewage in the operational phase are the only wastes expected to be associated with the project. The EMPr and emergency preparedness and response plan identifies these anticipated hazardous materials and recommends relevant mitigation and management measures.
Performance Standard 4: Community Health, Safety, and Security		
Performance Standard 4 recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. **Objectives:** – To anticipate and avoid adverse impacts on the health and safety of the Affected Community during the project life from both routine and non-routine circumstances. – To ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the Affected Communities		
4.1	– Community Health and Safety – Infrastructure and Equipment Design and Safety	The requirements included in PS 4 have been addressed in the BAR process and the development of the EMPr. The following plans have been included in the EMPr:

Reference	Requirements	Project Specific Applicability
	– Hazardous Materials Management and Safety – Ecosystem Services – Community Exposure to Disease – Emergency Preparedness and Response	– Emergency Response Plan (Section 9.12); – A Community health Safety and Security Plan must be drafted for the project and adhered to and implemented by the Holder of the EA as well as any principal Contractors and sub-contractors – Transport Management Plan (**Appendix C**); – HIV Management Plan (Section 9.14); and – Security Policy (Section 9.16).
4.2	Security Personnel	
Performance Standard 5: Land Acquisition and Involuntary Resettlement		
Performance Standard 5 recognises that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons that use this land. Involuntary resettlement refers both to physical displacement (relocation or loss of shelter) and to economic displacement (loss of assets or access to assets that leads to loss of income sources or other means of livelihood) as a result of project-related land acquisition and/or restrictions on land use. **Objectives:** – To avoid, and when avoidance is not possible, minimise displacement by exploring alternative project designs. – To avoid forced eviction. – To anticipate and avoid, or where avoidance is not possible, minimise adverse social and economic impacts from land acquisition or restrictions on land use by (i) providing compensation for loss of assets at replacement cost and (ii) ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation, and the informed participation of those affected. – To improve, or restore, the livelihoods and standards of living of displaced persons. – To improve living conditions among physically displaced persons through the provision of adequate housing with security of tenure at resettlement sites.		
5.1	– Displacement – Physical Displacement – Economic Displacement – Private Sector Responsibilities under Government Managed Resettlement	In terms of the land acquisition and involuntary settlement provisions in IFC PS 5, the development site is located on privately owned land that is utilised for the sole commercial agricultural use by the landowner. The project will restrict the future use of the land by the landowner through a lease agreement between the project SPV and the landowner. There is no involuntary physical or economic displacement or resettlement involved with this project.
Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources		
Performance Standard 6 recognizes that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable development. **Objectives:** – To protect and conserve biodiversity. – To maintain the benefits from ecosystem services. – To promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.		
6.1	Protection and Conservation of Biodiversity	PS 6 is not deemed applicable. However, all aspects of biodiversity will be managed through the recommendations outlined by the specialists and the EMPr.
Performance Standard 7: Indigenous People		
Performance Standard 7 recognizes that Indigenous Peoples, as social groups with identities that are distinct from mainstream groups in national societies, are often among the most marginalized and vulnerable segments of the population. In many cases, their economic, social, and legal status limits their capacity to defend their rights to, and interests in, lands and natural and cultural resources, and may restrict their ability to participate in and benefit from development. Indigenous Peoples are particularly vulnerable if their lands and resources are transformed, encroached upon, or significantly degraded.		

Reference	Requirements	Project Specific Applicability
Objectives: — To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples. — To anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts. — To promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner. — To establish and maintain an ongoing relationship based on Informed Consultation and Participation (ICP) with the Indigenous Peoples affected by a project throughout the project's life-cycle. — To ensure the Free, Prior, and Informed Consent (FPIC) of the Affected Communities of Indigenous Peoples when the circumstances described in this Performance Standard are present. — To respect and preserve the culture, knowledge, and practices of Indigenous Peoples.		
5.1	General — Avoidance of Adverse Impacts — Participation and Consent	There are no identified indigenous people in South Africa. PS 7 is therefore not applicable.
5.2	Circumstances Requiring Free, Prior, and Informed Consent — Impacts on Lands and Natural Resources Subject to Traditional Ownership or Under Customary Use — Critical Cultural Heritage — Relocation of Indigenous Peoples from Lands and Natural Resources Subject to Traditional Ownership or Under Customary Use	
5.3	Mitigation and Development Benefits	
5.4	Private Sector Responsibilities Where Government is Responsible for Managing Indigenous Peoples Issues	
Performance Standard 8: Cultural Heritage		
Performance Standard 8 recognizes the importance of cultural heritage for current and future generations **Objectives:** — To protect cultural heritage from the adverse impacts of project activities and support its preservation. — To promote the equitable sharing of benefits from the use of cultural heritage.		
8.1	Protection of Cultural Heritage in Project Design and Execution	A cultural heritage study has been undertaken (Ms Celeste Booth – Booth Heritage Consulting) and the potential impacts resulting from the installation of a WEF on the heritage resources of the sites are considered to be of low significance. A detailed cultural heritage walkdown was undertaken by CTS Heritage, the results of which have informed the development of the Final Layout Plan. A summary of the walkdown results is included in Section 5.7 and the full walkdown report is included in Appendix J.

Reference	Requirements	Project Specific Applicability
		Chance find provisions have been included in the EMPr in Section 9.15. In term of the projects ESMS's requirements a Chance Find procedure will be implemented on site. A Heritage Conservation Management Plan is included in **Appendix F**. The office of the regional land claims commissioner confirmed the absence of land claims against the property in terms of the Restitution of Land Rights Act (1994) during 2018.

2.2.1 *RIETKLOOF ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM*

An environmental and social management system (ESMS) shall be implemented by the project. The system is founded on the requirements of the Equator Principles, International Finance Corporation (IFC) Performance Standards, IFC EHS Guidelines, IFC Sector Guidelines and Good International Industry Practices which are applicable at the Project, as well as ensuring compliance with:

- The social safeguards of the European Investment Bank covering population movement, including involuntary resettlement.
- The International Labour Organization's Core Labour Standards and Basic Terms and Conditions of Work.
- The International Bill of Human Rights in line with the United Nations' Guiding Principles on Business and Human Rights safeguards.

Project policies include the following, but are not limited to these, in terms of environmental and social management:

- Environmental, Health, Safety and Social Policy
- Labour Policy
- Drug and Alcohol Policy
- Smoking Policy
- Code of Conduct

An environmental, health, safety, security and social specification outlines the expectations applicable to contractors, to ensure IFC PS benchmarks are met.

A project-specific stakeholder engagement plan shall be developed in terms of IFC PS 1. Internal and external grievance mechanisms shall be implemented, as per the project ESMS, throughout the lifecycle of the project.

The Community Health and Safety Plan shall be implemented as a component of the ESMS, as per IFC PS 1 and IFC PS 4, and shall prescribe mitigation measures for potential community impacts that may be associated with project activities. These mitigation measures would include measures identified by certain parties that have previously raised concerns in terms of security issues during construction and further into operation.

Independent monitoring of the effective implementation of the ESMS shall be undertaken in terms of an independent monitoring schedule as per the requirements of the projects' s ESMS. Both internal and external audits on the ESMS will be undertaken during the lifecycle of the project and as prescribed by the projects ESMS.

All the ESMS documents with the EA, EMPr and any other legislated permits will become the management system/tool for the project.

3 PROJECT DETAILS

3.1 PROJECT LOCATION

The proposed project is to be developed approximately 30km east of Matjiesfontein, along the N1 in the Western Cape and will comprise a single site located on the farms outlined in **Table 3-1**.

Table 3-1: Farm portions on which the proposed developed is located

FARM NAME AND NUMBER	21 DIGIT SG CODE	MUNICIPALITY/PROVINCE	FARM SIZE (HA)
Portion 1 of Barendskraal 76	C04300000000007600001	Laingsburg LM / Central Karoo DM / Western Cape	2,828.6
The Remainder of Fortuin 74	C04300000000007400000	Laingsburg LM / Central Karoo DM / Western Cape	2,454.89
Portion 3 Fortuin 74	C04300000000007400003	Laingsburg LM / Central Karoo DM / Western Cape	1,868.4
Portion 1 of Hartjieskraal 77	C04300000000007700001	Laingsburg LM / Central Karoo DM / Western Cape	2,241.6
The Remainder of Hartjieskraal 77	C04300000000007700000	Laingsburg LM / Central Karoo DM / Western Cape	2,241.63
The Remainder of Nuwerus 284	C04300000000028400000	Laingsburg LM / Central Karoo DM / Western Cape	2,521.1
Portion 1 of Rietkloof Annexe 88	C04300000000008800001	Laingsburg LM / Central Karoo DM / Western Cape	1,428.6
The Remainder of Snyders Kloof 80	C04300000000008000000	Laingsburg LM / Central Karoo DM / Western Cape	1,678.8
Portion 1 of Snyders Kloof 80	C04300000000008000001	Laingsburg LM / Central Karoo DM / Western Cape	1,627,3
Vogelstruisfontein 81	C04300000000008100000	Laingsburg LM / Central Karoo DM / Western Cape	4,040.1
Remainder of Wilgehout Fontein 87	C04300000000008700000	Laingsburg LM / Central Karoo DM / Western Cape	4,269.5
Portion 1 of Ou Mure 74	C04300000000007400001	Laingsburg LM / Central Karoo DM / Western Cape	407,57
		Total hectares	**27,608,09**

The Rietkloof WEF falls within the Laingsburg Local Municipality under the jurisdiction of the Central Karoo District Municipality. The locality map for the Rietkloof WEF is shown in **Figure 3-1.**

The turbine layout for the Rietkloof WEF assessed during the BA process in 2018 is illustrated in **Figure 3-2**. The 60 turbine layout relevant to the merged EA is included in **Figure 3-3**. **Figure 3-4** shows the final layout map of 47 turbine positions determined during the finalisation of this EMPr.

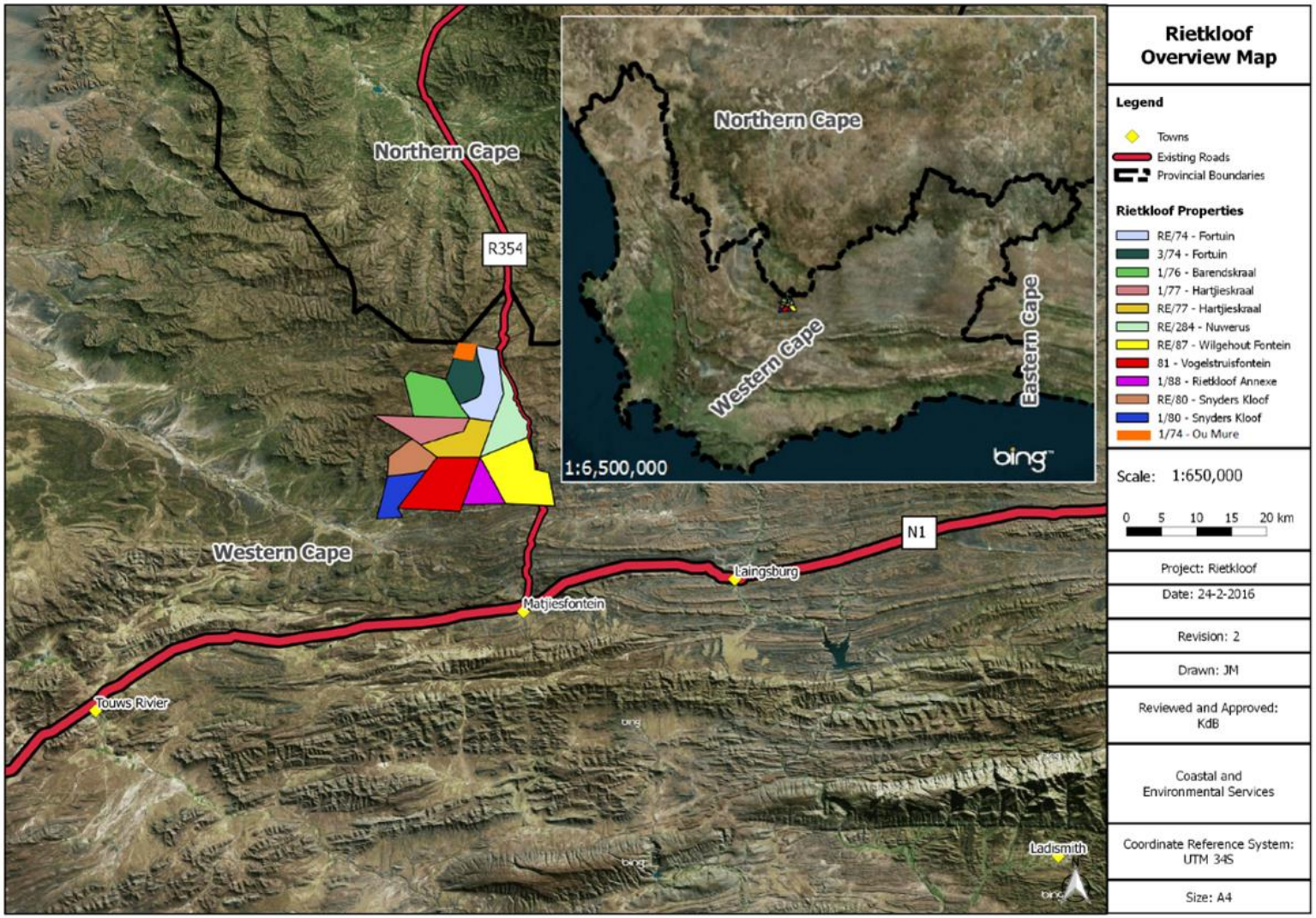


Figure 3-1: Location of the Rietkloof WEF

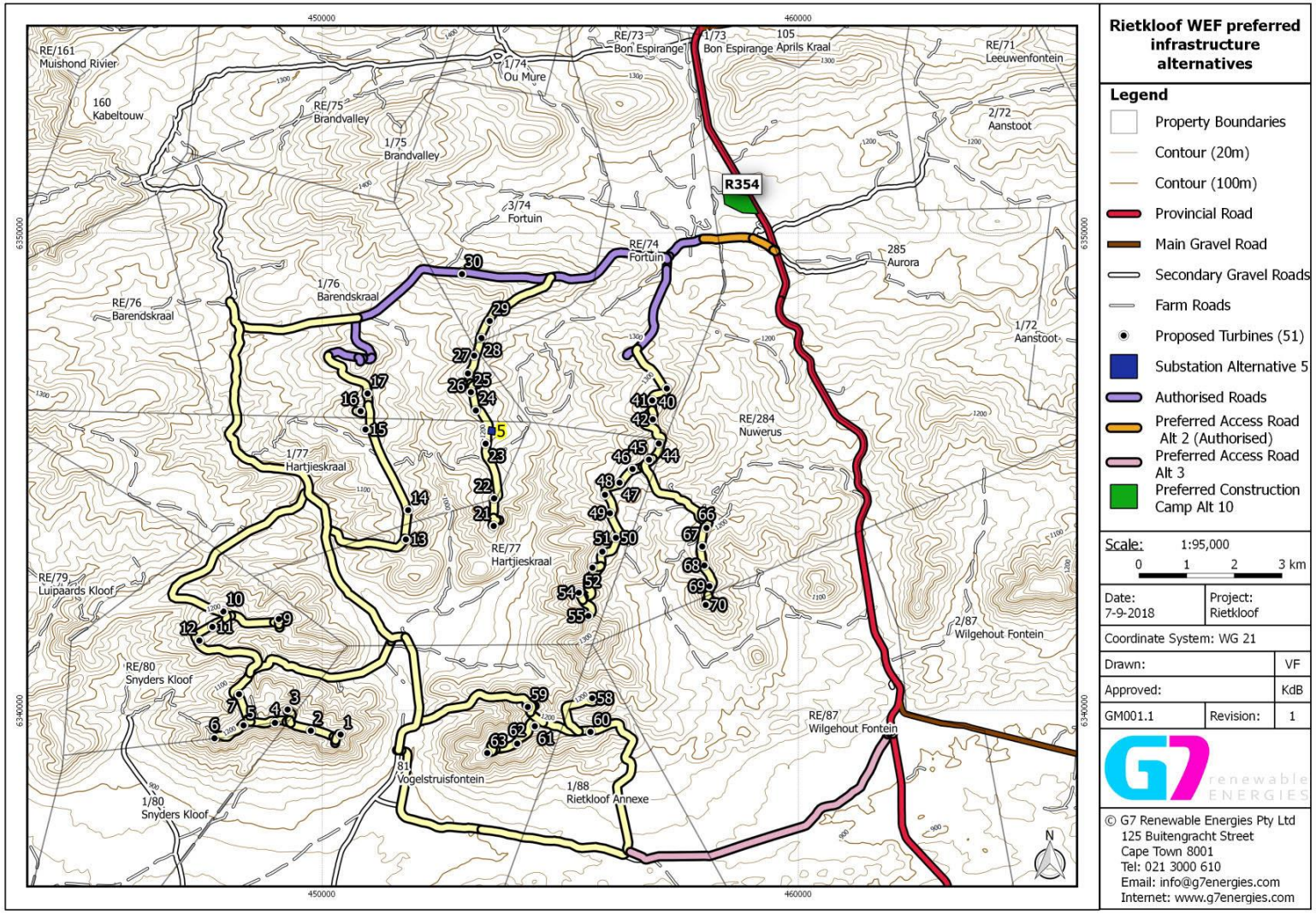


Figure 3-2: Turbine layout for the 51 turbine positions authorised for the Rietkloof WEF

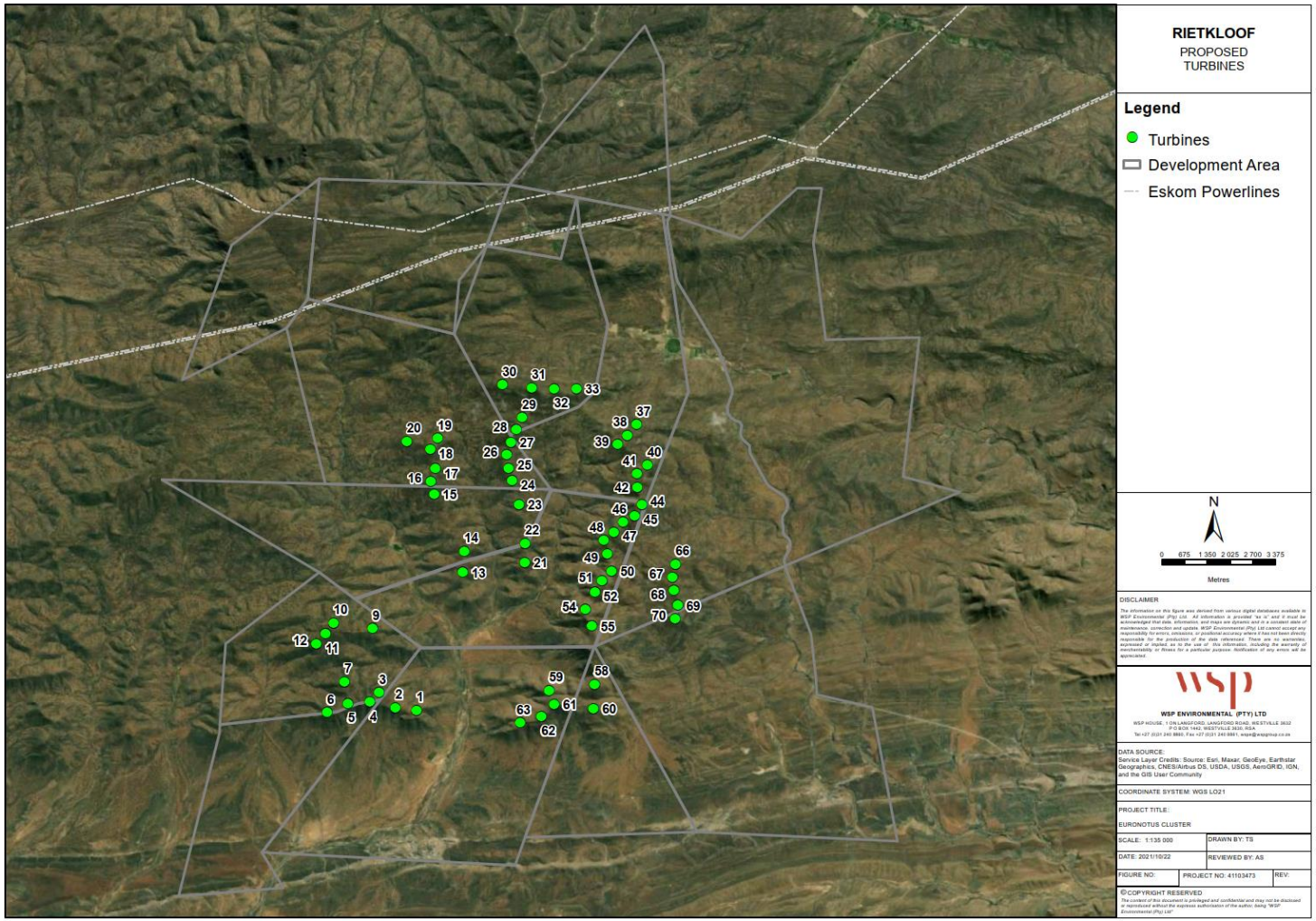


Figure 3-3: Position of the 60 Turbines which formed the Original Layout relevant to the September 2019 EA

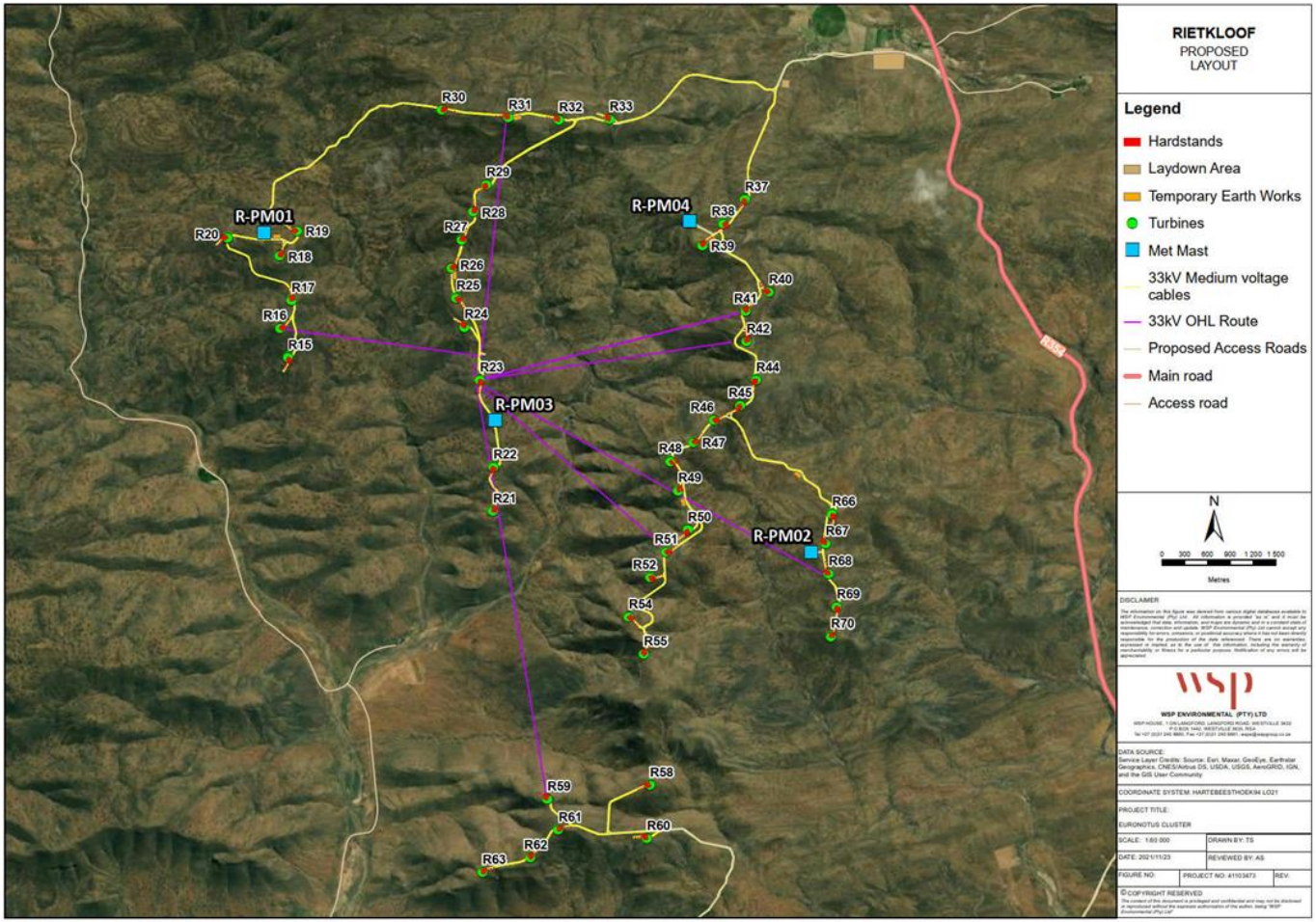


Figure 3-4: Final layout[6], including the 47 turbine positions for the Rietkloof WEF

[6] This is considered a worst-case final layout with 47 turbines. It is however likely that once the turbine manufacturer has been confirmed, the layout will drop to a maximum of 34 turbines

3.2 PROJECT DESCRIPTION

Table 3-2 provides a summary of the Rietkloof Project Details:

Table 3-2: Rietkloof WEF Project Details

TECHNICAL DETAILS OF THE PROPOSED RIETKLOOF WEF

Location of Site	The proposed project is to be developed approximately 30km North of Matjiesfontein in the Western Cape
Farm Names	• Portion 1 of Barendskraal 76 • The Remainder of Fortuin 74 • Portion 3 Fortuin 74 • Portion 1 of Hartjieskraal 77 • The Remainder of Hartjieskraal 77 • The Remainder of Nuwerus 284 • Portion 1 of Rietkloof Annexe 88 • The Remainder of Snyders Kloof 80 • Portion 1 of Snyders Kloof 80 • Vogelstruisfontein 81 • Remainder of Wilgehout Fontein 87 • Portion 1 of Ou Mure 74
SG Codes	• C04300000000007600001 • C04300000000007400000 • C04300000000007400003 • C04300000000007700001 • C04300000000007700000 • C04300000000028400000 • C04300000000008800001 • C04300000000008000000 • C04300000000008000001 • C04300000000008100000 • C04300000000008700000 • C04300000000007400001
Total area of Site	27 608,09 ha
Size of Buildable Area i.e. project infrastructure footprint (only preferred layout, inclusive of all associated infrastructure)	up to 126.6ha
Area Occupied by Each Turbine and hard standing area	Each turbine with a foundation of up to 25m in diameter and up to 4m in depth (area of 490m^2), compacted hardstanding areas of between 0.35 and 0.45ha each
Generation Capacity (at 132kV point of utility connection)	183MW generation capacity

Technology	Wind
Number of Turbines	Up to 47
Turbine Hub Height	A hub height of up to 125m
Rotor Diameter	A rotor diameter of up to 180m
Turbine Foundation Area	Each turbine foundation will be 25m diameter x 4m deep. The total foundation area of all 47 turbines will not exceed 3.75ha.
Area of Electrical Turbine Transformers	100m^2 (10m x10m) per turbine
Location of Preferred Operations and Maintenance Building Assessment Site	O&M buildings will be in proximity of the Substation.
size of Operations and Maintenance Building(s)	O&M building includes operations, on site spares storage and workshop.
Area of Preferred Construction footprint and batching plant footprint	Construction camp typical area will be approximately 10ha and onsite concrete batching plant of up to 1ha.
Width of Internal Roads	No more than 12m wide (turns will have a radius of up to 55m)
Area of Internal Roads	~50ha
Type and Height of Fencing	Approximately 4m high palisade or mesh fencing where required.
Sewage	Conservancy Tanks (with portable toilets during the construction phase).
Power Evacuation	
Area of Internal Onsite Substation	200m x 200m – 4ha
Onsite Substation Capacity	33kV and 132kV yards
Specifications of onsite switching stations, transformers, invertors, onsite cables etc	The medium voltage collector system will comprise of cables (1kV up to and including 33kV) that will be run underground, except where a technical assessment suggests that overhead lines are applicable, in the facility connecting the turbines to the onsite substation.
Closest Grid Connection Point	Bon Espirange Switching Substation

3.3 PROPOSED PROJECT DEVELOPMENT ACTIVITIES

The following activities (**Table 3-3**) are proposed to be undertaken during the life-cycle of the WEF and are likely to have positive or negative impacts on the environment.

Table 3-3: Summary of proposed activities

PHASE	DURATION	ACTIVITIES
Construction phase	18 to 24 months	**Establishment of an access road to the site Setting out of construction area**- The site is already easily accessible via the tarred R354 national road.
		Establishment of internal roads- Internal road access will be constructed onsite. These roads will be a maximum of 12m in width.
		Site preparation- Site preparation includes the clearance of vegetation (only actual footprint of the WEF) and any bulk earthworks (including blasting if required) within the footprint of each construction area that may be required in terms of the facility design.
		Transport of components and equipment to site- All construction material (soil, sand etc.), infrastructure components (i.e. masts, blades, tower sections, nacelles, electrical components and associated infrastructure), machinery and equipment (i.e. graders, excavators, trucks, cement mixers etc.) will be transported to site utilising the national, regional and local road network. Large components (such as substation transformers and turbine sections) may be defined as abnormal loads in terms of the Road Traffic Act (No. 29 of 1989). In such cases a permit may be required for the transportation of these loads on public roads in which case, will be obtained prior to transporting any abnormal loads to site.
		Establishment of a laydown/ construction camp area on site- Construction materials, machinery and equipment will be kept at relevant laydown and/or storage areas. A laydown and storage area not exceeding 10 ha has been proposed for this project. The laydown area will limit potential environmental impacts associated with the construction phase by limiting the extent of the activities to one designated area.
		Construct foundations- Concrete foundations will be constructed at each turbine location. Foundation holes will be excavated to a depth of 4m, depending on the local geology. Concrete will be batched on site. The reinforced concrete foundation will have a footprint of approximately 490m^2 per turbine.
		Construction of the turbines- A large lifting crane will be brought onto site to lift each of the tower parts into place. The hardstand area will be approximately 0.45ha per turbine.
		Construct Independent Power Producer (IPP) substation and invertors- Invertors will be installed to facilitate the connection between the wind turbines and the Eskom Grid. The turbines will be connected to the substation via underground or overhead cabling. The substation will be constructed with a maximum footprint of approximately 200m x 200m, which equates to 40 000m^2 (4ha).
		Establishment of ancillary infrastructure- Ancillary infrastructure will include a cabling, workshop, storage areas, office and a temporary laydown area for contractor's equipment.
		Undertake site rehabilitation- The site will be rehabilitated once the construction phase is complete and all construction equipment and machinery has been removed from site.

PHASE	DURATION	ACTIVITIES
		Ongoing monitoring – an Environmental Officer (EO) and independent Environmental Control Officer (ECO) will be appointed to oversee all construction activities and ensure that this is undertaken in line with this EMPr.
Operational phase	20 years	The proposed Rietkloof WEF is anticipated to have a minimum lifespan of 20 years. The facility will operate 7 days a week. While the project is considered to be self-sufficient, maintenance and monitoring activities will be required. Potable water requirements for permanent staff will be limited and provided by bottled water or other more sustainable sources of potable water. Other services such as waste and sewage removal will be provided by qualified service providers. Only major breakdowns or refurbishment would necessitate the use of cranes and trucks.
Decommissioning phase	Two years	Following the initial 20-year operational period of the WEF, the continued economic viability will be investigated. In the event that the facility is still deemed viable the life of the facility will be extended. The facility will only be decommissioned once it is no longer economically viable or the power purchase agreement ends and cannot be renewed or a new one entered into. In the event that a decision is made to completely decommission the facility, it will be subject to an environmental process in terms of NEMA to apply for environmental authorisation to decommission the facility. If granted, all the components will be disassembled, reused and recycled or disposed in line with the decommissioning plan, to be drafted during the environmental process for the decommissioning of the WEF. It is anticipated that the site would be returned to its current use i.e. agriculture (grazing).

3.4 PROJECT NEED AND DESIRABILITY

The need for and the desirability of the Rietkloof WEF, forms an integral part of the EA process. This section has been compiled in accordance with the DEA's (now known as the DFFE) guideline on need and desirability 2017. The need and desirability were determined by considering the broader community's needs and interests as reflected in the IDP and SDF's) as well as the spatial planning and policies described in **Section 4** of the BAR applicable to the study area.

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 being emitted into the atmosphere and thus to climate change.

Most of South Africa's energy comes from non-renewable sources like coal, petroleum, natural gas, propane, and uranium. Currently, fossil fuels supply ~90% of South Africa's energy needs with demands on energy supply increasing by between 1.2% and 2% in the next 20 years (draft IRP2018). According to the Independent Power Producer Procurement Programme, by April 2016, 6400 MW of the 7000 MW target for 2020 has been procured from 102 IPPs from Bidding Windows 1 to 4. By the end of October 2016, 2.8GW of the procured capacity from 53 IPPs had already started operations. The South African Government recognises the need to diversify the mix of energy generation technologies within the country and to reduce the country's reliance on fossil fuels which contribute towards climate change. Therefore, the purpose is to move towards an energy mix that gradually shifts away from energy generation technologies that are not environmentally friendly, to honour its commitments made under the Copenhagen Accord and subsequent Paris Agreement (ratified during November 2016). Under the Paris Agreement, the country committed to working towards the goal of holding the increase in global average temperature to well below 2 degrees Celsius and pursuing efforts to limit global temperature increase to 1.5 degrees Celsius.

The DFFE acknowledges the risks posed to South Africa by climate change confirming that "*South Africa has been experiencing the severe effects of drought conditions catalysed by the worst El Nino event in decades. The rising sea temperatures in the Pacific Ocean that resulted in increased temperatures and reduced rainfall in many parts of the world, was exacerbated by rising global temperatures associated with climate change. South African*

scientists and weather forecasters warn that this is what can be expected in the decades to come, if ambitious global action is not taken urgently to reduce the concentration of greenhouse gases in the atmosphere" (DEA, 2016).

3.4.1 NEED

There's a clear need to transform towards low carbon economy by reducing reliance on non-renewable sources for electricity. On an international, national and local scale, the pressing need is job creation, social opportunities coupled with clean and affordable electricity for all. The sections below provide an overview of the key needs identified.

INTERNATIONAL

In accordance with the prescriptions of the United Nations Framework Convention on Climate Change and its associated Kyoto protocol of 1997 South Africa has put in place a long-term mitigation scenario by which the country aims to develop a plan of action which is economically viable and internationally aligned to the world effort on climate change. During this period (2003-2050) South Africa will aim to take action to mitigate greenhouse gas emissions by 30% - 40% by the year 2050. This is a reduction of between 9000 and 17 500 tons of CO_2 by 2050.

The Paris Agreement, of which South Africa is a signatory, entered into force on the 4th November 2016. The Paris agreement brings all nations into a common cause to undertake the ambitious efforts of climate change and adapt to its effects, with enhanced support to assist developing countries. The main objective of the agreement is to limit the global temperature increase to well below 2ºC, while pursing efforts to limit the increase to 1.5ºC (DEA, 2016a). On the 1st January 2018 the 17 Sustainable Development Goals (SDG's) of the 2030 Agenda for Sustainable Development, came into effect. The SDG's build on the success of the Millennium Development Goals such as continued poverty alleviation but also include climate change, economic inequality, innovation, sustainable consumption, peace and justice, among other priorities. The 17 SDG's are:

1. No poverty
2. Zero Hunger
3. Good health and well-being
4. Quality Education
5. Gender equality
6. Clean water and Sanitation
7. Affordable and clean energy
8. Decent work and economic growth
9. Industry, innovation and infratsructure
10. Reduced inequalities
11. Sustainable Cities and Communities
12. Responsible Cosnumption and Production
13. Climate Action
14. Life Below Water
15. Life on Land
16. Peace, Justice and strong institutions
17. Partnerships for the goals

The development of Renewable Energy in South Africa supports SDG 1, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 and 15 through the creation of jobs, the economic development opportunities, generation of energy from wind resources and reducing the countries reliance on non-renewable energy sources.

NATIONAL

The National Development Plan (NDP) is aimed at reducing and eliminating poverty in South Africa by 2030. It promotes sustainable and inclusive development in South Africa, in favour of a decent standard of living for all. The proposed Rietkloof WEF fulfils 3 of the 12 key focus areas namely contributing to an economy that will create more jobs; improving infrastructure and transition to a low carbon economy. The NDP outlines the need for South Africa to increase production of electricity by 40,000 MW by 2030, 20,000 MW of this capacity has

been proposed for production from renewable sources (NDP 2012). The proposed project aims to be a contributor towards such target.

Rietkloof included this WEF in their Round 5 bid submission under the REIPPP programme . It has been confirmed that the Rietkloof WEF is a Round 5 Preferred Bidder Project.

As demonstrated above there is a need for renewable energy in South Africa and the proposed Rietkloof WEF aims, in part, to fulfil this need.

.

In line with the NDP and the strategic energy planning context, Rietkloof WEF has the ability to contribute to the local economy of Lainsgburg and Matjiesfontein that will create more jobs, it will improve grid infrastructure and be part of the South African plan to transition to a low carbon economy by generating electricity from a renewable source.

Furthermore, the competitive nature of the Renewable Energy Independent Power Producers Procurement Programme (REIPPPP), allows the DoE to procure electricity at the lowest tariff and the highest social contribution. The tariff is directly linked to the wind resources onsite. Rietkloof WEF is proposed in an area that has significant wind resources, as evident by the area being gazetted as a REDZ. Therefore, Rietkloof WEF has the ability to bid a project with low electricity tariff while contribute to the solution to provide all with affordable access to electricity along with other significant social benefits.

3.4.2 LOCAL

INTEGRATED DEVELOPMENT PLANS

IDPs for the Central Karoo District Municipality (2012 – 2017) is in accordance with the objectives of the NDP, which encourage the generation of electricity through renewable energy and to reduce carbon-intensive electricity production. The proposed Rietkloof WEF is thus in line with the objectives of the IDP for the municipality in which it falls, as described in **Table 3-4**.

Table 3-4: Relevance of the Local Planning Guides

LOCAL PLANNING GUIDE	RELEVANCE
Central Karoo District Municipality (CKDM) IDP (2012-2017)	*The CKDM IDP promotes sustainability through the integration of social, economic and ecological components. The planning document highlights the increasingly importance of sustainable energy, emphasising the national vision to focus on renewable energy as a movement towards less carbon-intensive electricity production. The CKDM IDP and SDF make provision for wind farms within the Central Karoo as an alternative energy source.*
Laingsburg Local Municipality (LLM) IDP (2012/2017)	*The key strategies proposed by the LLM IDP within the Strategic Infrastructure and the Environmental and Spatial Development approaches include the support and promotion of wind, solar and bio-gas developments as a source of alternative energy.*
Laingsburg Municipality SDF	*The Laingsburg Municipal SDF identifies projects of strategic importance to the Karoo basin and how the potential impacts can be managed and mitigated. Renewable energy projects are identified as strategic projects.*
Central Karoo District Municipality SDF	*The SDF outlines Spatial Development Strategies that call for the implementation of alternative energy use plans and support alternative and sustainable energy sources.*

3.4.3 *DESIRABILITY*

RENEWABLE ENERGIES

The desirability of wind energy can be explained by considering the planning context, the REDZ, the wind resource availability in South Africa and the benefits of wind energy as opposed to for instance solar energy.

As discussed in Section 6.1 of the final BAR, there is a clear need for electricity generation of renewable resources such as wind energy as the conventional sources of energy generation, such as coal, oil and fuel, produce GHS emissions directly contributing to human induced climate change. The policy and legislation as discussed in Section 4 of the final BAR supports the development and increase use of renewable sources of energy.

In 2016, the CSIR considered the ability of South Africa to produce electricity from wind turbines. The primary findings of the study included the following:

- More than 80% of South Africa's land mass has enough wind resource for economic wind farms with very high annual load factors of greater than 30%.
- The vast size of the South African power system allows for a very strong portfolio effect. Short-term fluctuations in the aggregated wind power feed-in are significantly reduced by wide spatial distribution.
- Up to a 65% energy share in electricity supply from a combined wind and solar PV fleet can be achieved without any significant excess energy meaning that if 65% of South Africa's energy were produced from wind and solar, the grid can be balanced to avoid having excess energy (CSIR, 2016).

This was based on land availability and the wide spread wind resources in South Africa.

SUSTAINABLE DEVELOPMENT

Sustainable energy is defined as "*energy which provides affordable, accessible and reliable energy services that meet economic, social and environmental needs within overall developmental context of society, while recognising equitable distribution in meeting those needs*" (DEA, 2015). Sustainable energy is an element of sustainable development, defined as development that meets the needs of the people today without compromising the ability of future generations to meet their needs, which incorporates economic development, social development and environmental development.

Renewable energy developments are considered to contribute towards sustainable development, increasing access to electricity for both the current generation and for future generations, while additionally providing energy sources to commercial and industrial sectors to promote their economic competitiveness and future prosperity. Wind energy is a naturally generated and stable source of energy, contributing to the energy security and sustainable development and is thus in accordance with the country's development goals.

SITE SUITABILITY

The vast plains, the mountainous topography, the grid proximity and expected capacity as well as the predicted and confirmed wind resources contribute to the suitability of the Karoo, and the proposed location, for the development of Rietkloof WEF for the generation of power to meet the renewable energy requirements for South Africa.

The Strategic Environmental Assessment (SEA) for wind and solar PV energy in South Africa (CSIR, 2013) supports of the Strategic Integration Project (SIP) 8 which focuses on the implementation of sustainable green energy initiatives. The SEA integrated environmental, economic and social factors to identify eight (8) Renewable Development Zones (REDZs). The identified REDZs included areas where large scale wind energy facilities can be developed in a manner that limits significant negative impacts on the environment while yielding the highest possible socio-economic benefits to the country. The SEA process and the determination of the REDZs provided an opportunity for government authorities, the private sector and the public to provide input and agree on appropriate development areas.

The SEA additionally identified priority areas for investment opportunities into the electricity grid, providing a solution to the current limitations of existing grid infrastructure and the challenges faces in expanding the grid.

The proposed Rietkloof WEF falls within the Komsberg Wind REDZ. The REDZs are considered areas of the highest development potential on land that is technically suitable for wind and solar developments. Proposed projects that fall within these areas are thus incentivised and streamlined. The REDZs were gazetted on 16 February 2018 (GN 114).

Rietkloof WEF is a confirmed Round 5 Preferred Bidder Project.

PLANNING ENVIRONMENT IN PARTICULAR THE COMPATIBILITY OF THE REDZ AND THE WESTERN KAROO NATIONAL PROTECTED AREAS EXPANSION

The proposed WEF is located in an area where the Komsberg Renewable Energy Development Zone overlaps with the Western Karoo NPAES focus area (**Figure 3-5** an**d** Error! Reference source not found.) which are both important areas identified by means of broad scale planning. The closest protected area to the proposed site is the Anysberg Nature Reserve. The goal of NPAES is to achieve cost-effective protected area expansion for ecological sustainability and increased resilience to climate change. The document does not list conflicting land uses. Whereas the strategic planning goals of the REDZ are to earmark areas where large scale wind and solar PV energy facilities can be developed in a manner that limit the potential for significant negative impact on the natural environment, while yielding the highest possible social and economic benefits to the country. These REDZs were identified to support the Strategic Infrastructure Plan (SIP) 8 of the National Infrastructure Plan.

Rietkloof propose to develop a WEF of up to 47 turbines. Part of the project includes the implementation of a Conservation Management Plan conservation of approximately 5500 hectares of agricultural land, which would assist the DFFE to achieve the objectives of both the NPAES and the REDZ[7].

Therefore, it is concluded that on a local scale the REDZ and NPAES Focus Areas are compatible.

[7] It must be noted that the Part 2 Amendment Application recently submitted for the Rietkloof WEF (Ref: 14/12/16/3/3/1/1977/AM1) requests the removal of this requirement from the EA and subsequently the EMPr.

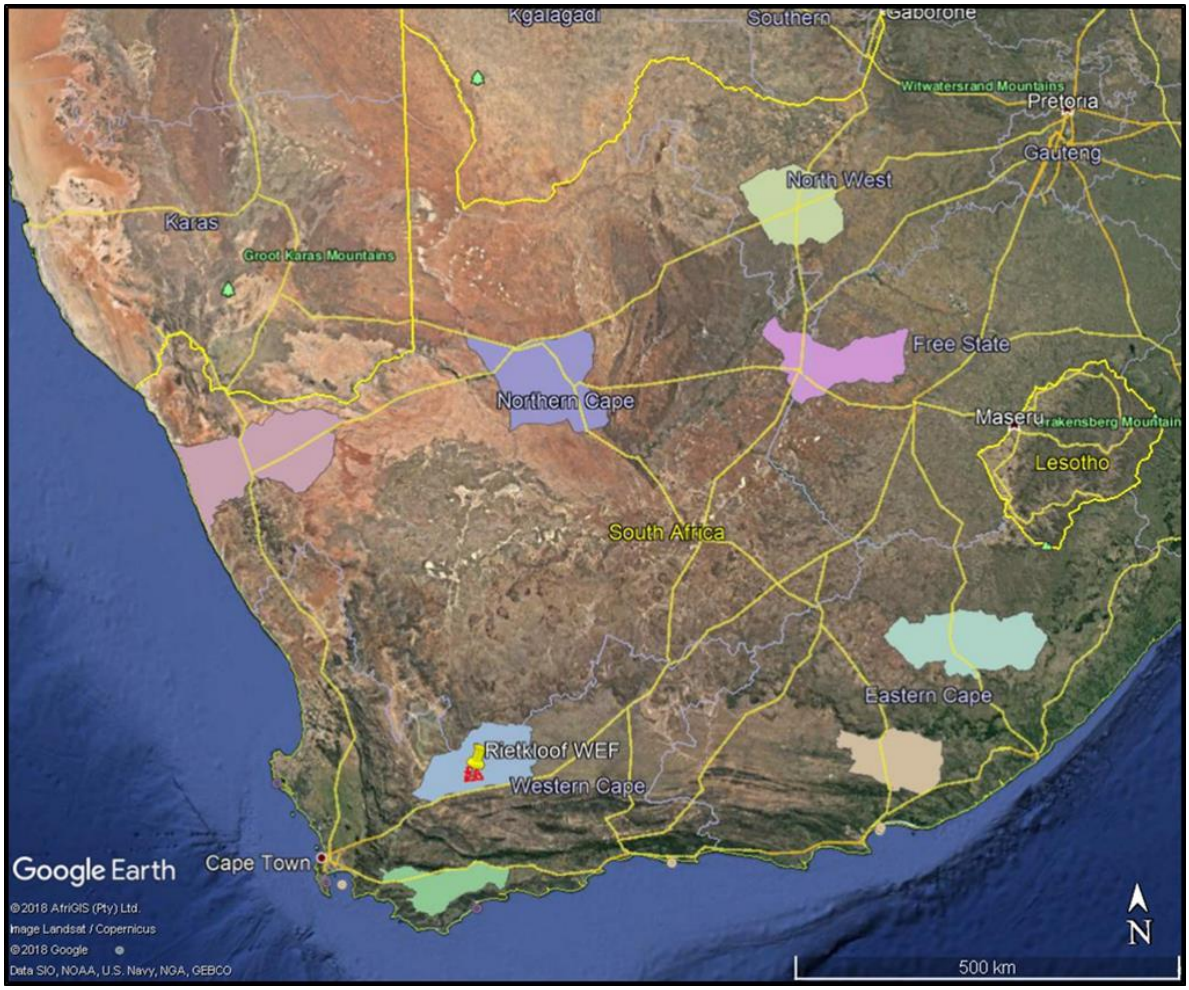


Figure 3-5: The proposed Rietkloof WEF project site in relation to the Komsberg REDZs and the seven other REDZ

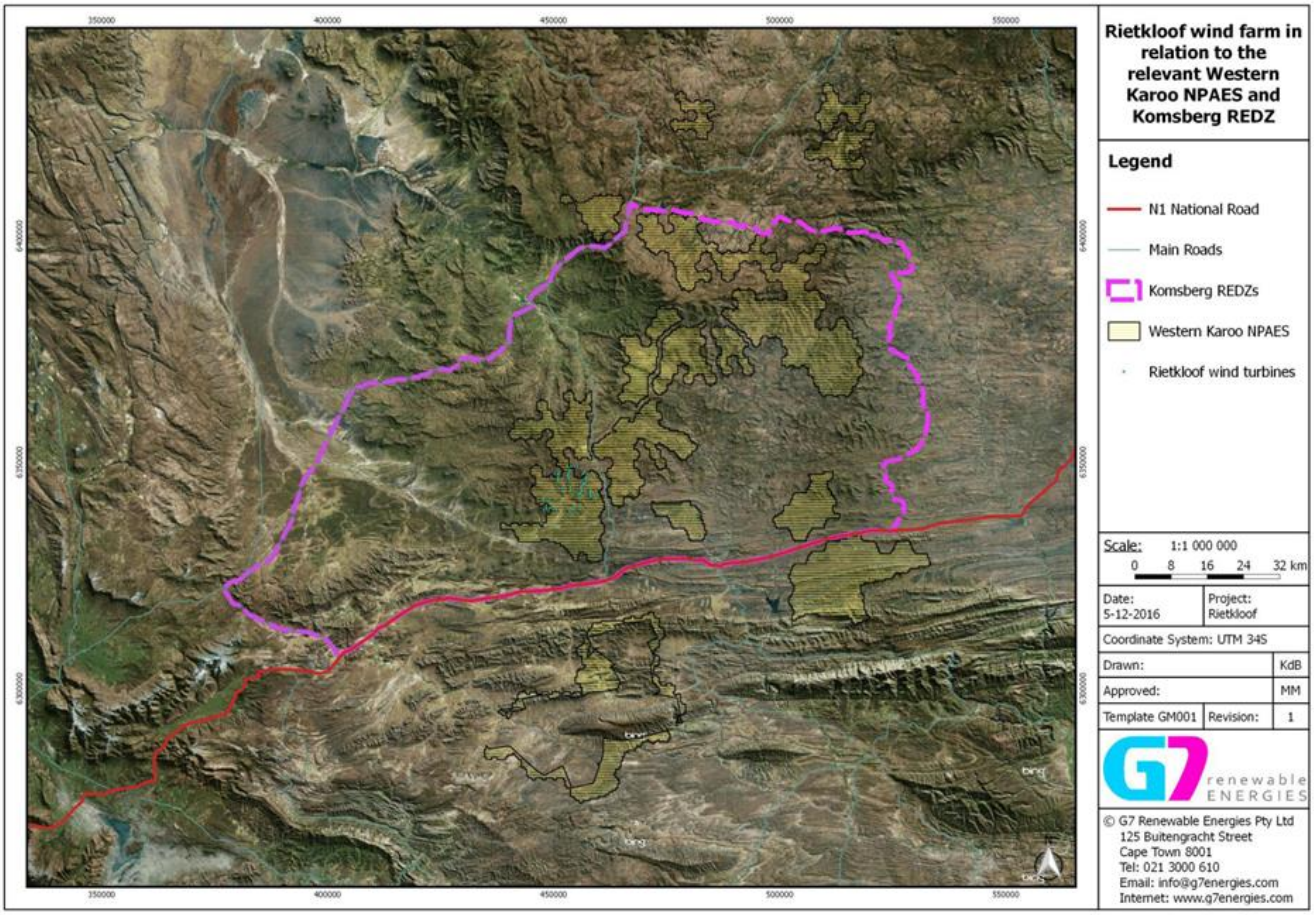


Figure 3-6: Rietkloof in relation to the Western Karoo NPAES and Komsberg REDZ

PROXIMITY TO OTHER WIND ENERGY PROJECTS AND ELECTRICAL INFRASTRUCTURE

There are other wind energy developments and electrical infrastructure proposed and existing in close proximity to the Rietkloof WEF (**Figure 3-7)**. These facilities are in various stages of development ranging from application phase to authorisation (environmental authorisation and preferred bidder). Although each location has its own wind patterns, the close proximity of wind farms in an area does have environmentally preferred advantages such as limiting certain impacts to that location as opposed to impacting a number of areas. It also confirms the region/locality as a high wind resource and a suitable area for renewable energy development. The following renewable energy projects are located within a 50km buffer around Rietkloof WEF:

- Kudusberg Wind Project;
- Konstabel Solar Project;
- Roggeveld Wind Project (**Preferred Bidder**, currently under construction);
- Karreebosch Wind Project;
- Rondekop Wind Project;
- Komsberg East and Komsberg West Wind Projects;
- Perdekraal Wind Project (**Preferred Bidder**, currently under construction);
- Witberg Wind Project;
- Sutherland Wind and Solar Project;
- Hidden Valley Wind Project (Karusa and Soetwater wind farms (**Preferred Bidders**, currently under construction);
- Gunstfontein Wind Project;

- Maralla East and West Wind Projects;
- Brandvalley Wind Project (**Preferred Bidder**, to be constructed in due course);
- Esizayo Wind Project; and
- Tooverberg Wind Project.

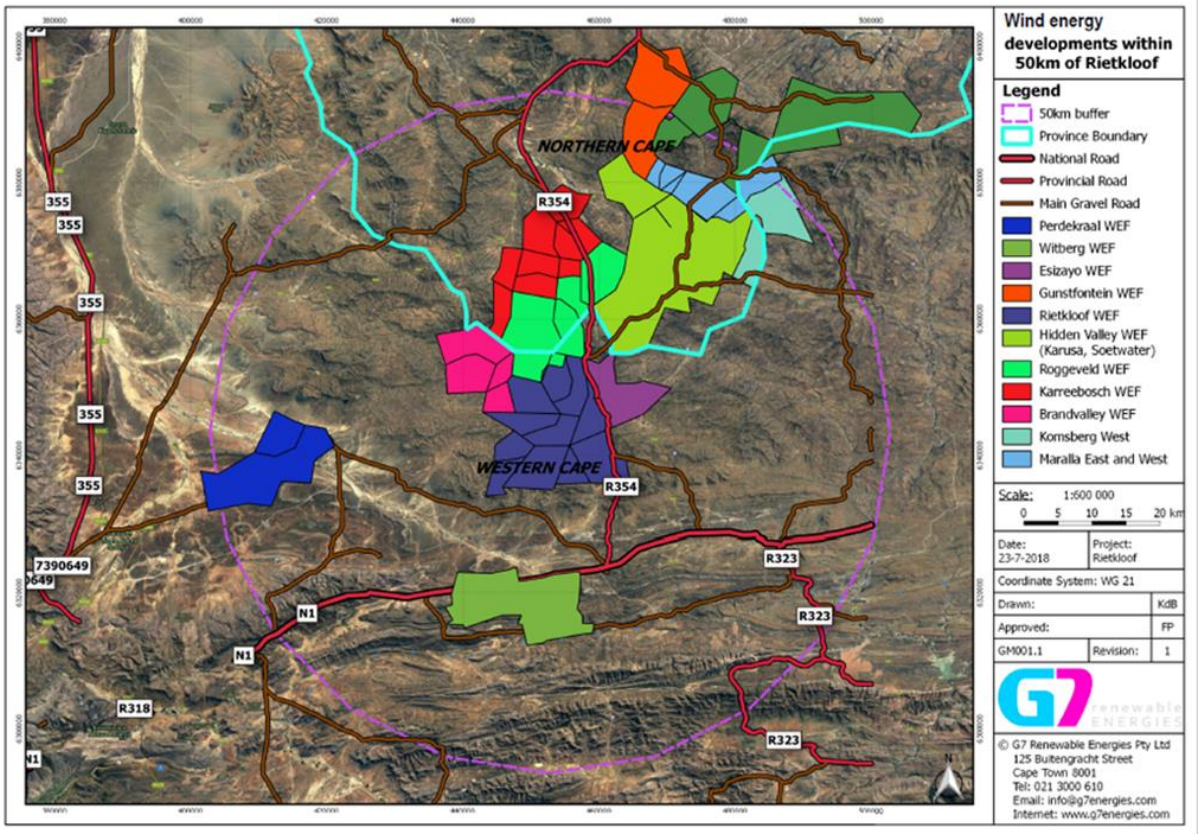


Figure 3-7: Wind Energy Facilities within a 50km radius of the Rietkloof WEF

Furthermore, there are Eskom high voltage transmission lines (one 765kV and two 400kV power lines) running immediatly north of the project area, running between the Komsberg substation and the Kappa substation. The recently built 765kV line runs from the Gamma substation near Victoria West past the Kappa substation near Touwsriver (southwest of the project site) to connect to the Omega substation near Koeberg. This is part of Eskom's grid strengthening project for power transmission and distribution in South Africa.

The Komsberg capacitor substation located northeast of the project site has two 400kV lines running through its capacitor banks from the Droerivier substation to the Bacchus and Muldersvlei substations, respectively, via the Kappa substation.

The approved renewable energy projects located in the vicinity are intended to ultimately be connected to the Komsberg or Kappa substations. The Komsberg substation will be upgraded to connect more projects to the grid (in excess of 13 x 140MW projects).

Projects located within the 50km buffer radius at the time of when specialists undertook their site assessments were considered in the cumulative impact assessment.

This clustering of developments is desirable as recommended by the SEA for REDZ and the expansion of South African grid infrastructure.

WIND RESOURCES

The Karoo, and more specifically the proposed location, is identified as a feasible area for wind energy in terms of the Wind Atlas for South Africa (WASA) for the Western Cape and parts of the Northern, Western and Eastern

Cape Provinces. WASA is a tool for identifying areas suitable for large-scale wind power generation and to provide more accurate wind resource data to identify potential off-grid wind generation location opportunities, using high climatological (30-year) annual mean wind speed (m/s) 100m above ground level. **Figure 3-8** below indicates the proposed location in relation to the WASA.

Figure 3-8: The Proposed Rietkloof WEF located within an area of high wind energy resources as identified by WASA (Source: EOH, 2016)

Rietkloof WEF is located in an area where four wind projects were selected as preferred bidders under the Round 4 REIPPPP. Roggeveld wind farm was able to bid with the lowest tariff (rand cents per kWh) ever in South Africa as a result of the very strong wind resources in the area. Rietkloof has monitored the wind resource in the greater area for a period of more than five years and has confirmed the high wind resources with certainty. The direct project area is currently being monitored by six wind monitoring masts to confirm the onsite wind resource which informed the preliminary layout of the WEF.

Figure 3-9 provides an overview of the wind resources (red= high, yellow = average, green/blue = low) measured and modelled for the Rietkloof development site.

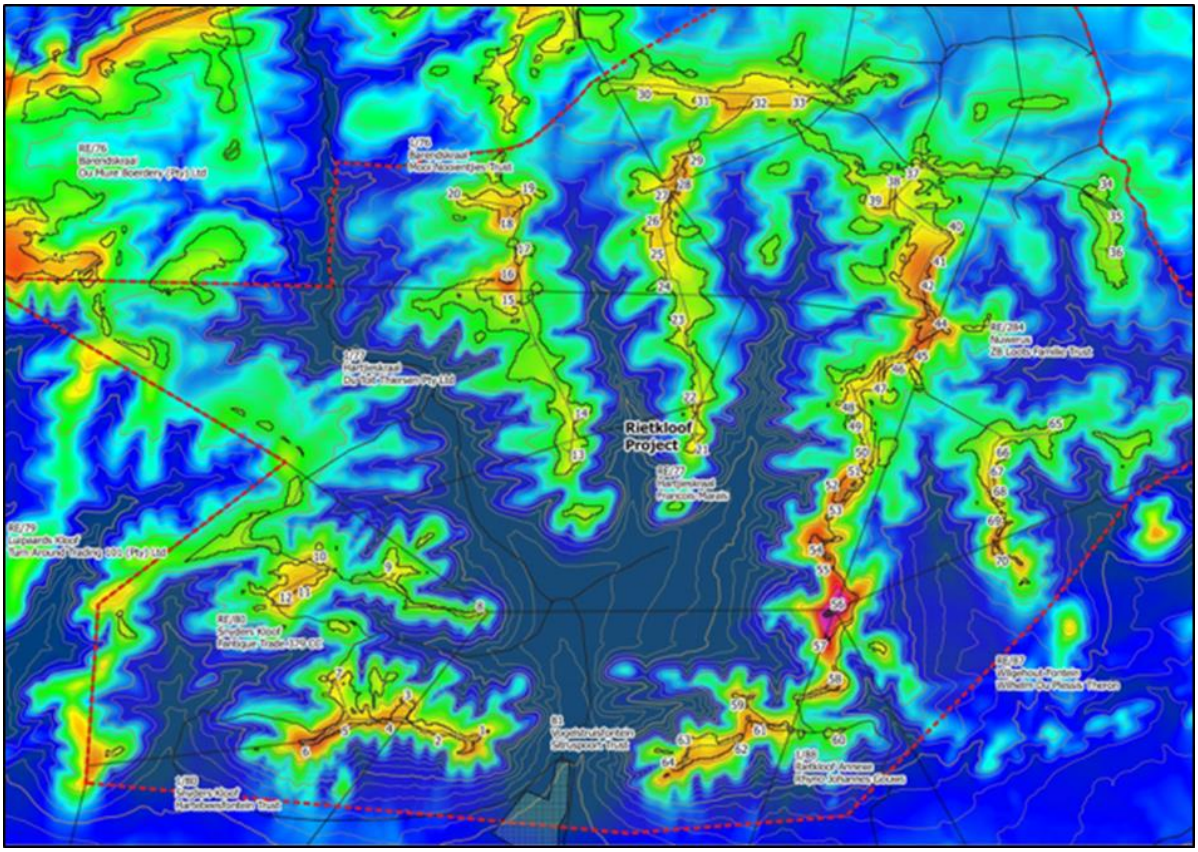


Figure 3-9: Wind Resources Map Modelled for the Rietkloof WEF

GRID SUITABILITY AND ACCESS

The development of Riektloof WEF is highly desirable when considering the grid access. The facility would construct a 132kV powerline to feed the electricity to the Bon Espirange substation (currently under construction) and then to the Komsberg substation. The Komsberg substation was expanded as part of separate project in 2018 is able to accommodate many more 140MW renewable projects. This is deemed favourable for this site due to the proximity of the existing Eskom Komsberg station, as the distance from a substation directly affects construction costs and losses associated with power transmission over a distance.

Similar to the Renewable Energy SEA, Eskom's Electricity Grid Infrastructure (EGI) Strategic Environmental Assessment (Grid SEA)[8] was undertaken and the proposed Rietkloof site, falls within the Central EGI corridor.

The Grid SEA aims to provide widespread distribution of electricity throughout South Africa and to initialise economic development within areas limited to electricity access to meet the country's economic and social development needs. The EGI corridors were gazetted on 16 February 2018 (GN 113) and therefore the development of Rietkloof WEF within one of these corridors and in close proximity to the Komsberg substation, are highly desirable.

LAND SUITABILITY

The current land use is Agricultural which is desirable as the majority of farming practices can continue simultaneously to the construction and operation of the WEF. The landowners that are part of the WEF are supportive of the development and do not view the development as conflicting with their current land use practices.

[8] http://egi.csir.co.za/

TURBINES IMPORT AND TRANSPORTATION

The project area is in close proximity to the N1 national road. The R354 is the main arterial road providing access to the project area, where there are a number of existing local, untarred roads providing access within the project area. The close proximity to existing roads is desirable as this will facilitate transport of construction materials and turbines. Existing roads will be upgraded and used as far as possible in order to develop fewer new roads.

The ease of transportation of equipment, components and material to site are highly desirable.

SOCIAL

The area is characterised by high unemployment rates and low levels of education. The proposed WEF has a potential to create much needed employment opportunities for unskilled locals during the construction phase. Training opportunities will also be afforded to qualified local people who can be up-skilled to undertake certain roles during the construction and operational phases. In terms of the needs on the local community, the IDPs identified the need for development, social services, education and employment opportunities in this area. The Rietkloof WEF has a potential to make positive contribution towards the identified community needs. In terms of the economic development requirements of the REIPPPP, the project will commit to benefits for the local community, including job creation, localisation and community ownership.

A percentage of the revenue per annum from the operational wind energy facility will be made available to the community through a social beneficiation scheme, in accordance with the DoE bidding requirements of the REIPPPP. Therefore, the potential for creation of employment and business opportunities, and the opportunity for skills development for the local community is significant. Secondary social benefits can be expected in terms of additional spend in the nearby towns due to the increased demand for goods and services.

4 FINDINGS OF THE IMPACT ASSESSMENT - 2019

A summary of the identified impacts and corresponding (initial and residual) significance ratings for the proposed Rietkloof WEF preferred alternatives identified during the BA process are provided in Error! Not a valid bookmark self-reference. below.

Table 4-1: Impact Significance Summary

REF.	RECEIVING ENVIRONMENT	IMPACT DESCRIPTION	PHASE	STATUS	WITHOUT MITIGATION	WITH MITIGATION
C1	Climate	Limited impact on climate change due to emissions from machinery and vehicles on the site during construction.	Construction/ Decommissioning	Negative	**Low**	**Low**
C2		The manufacturing of the materials associated with the project, and associated transportation to site will result in indirect GHG emissions. There will be no GHG emissions directly associated with power generation from the facility in the operation phase due to the nature of the technology.	Operation	Negative	**Moderate**	**Low**
C3		The project may be regarded as having a positive impact in terms of GHG emissions associated with the development of power generation capacity in South Africa i.e. less GHG emissions per unit of power contributed when compared to conventional fossil fuel derived power.	Operation	Positive	**High**	**High**
T1	Topography	The development of infrastructure such as turbines, internal access roads, fencing etc. will result in the need for site clearance, top soil removal and earthmoving activities associated with the road and infrastructure construction. These activities will result in a minor change in the topographical profile of the site.	Construction	Negative	**Low**	**Low**
T2		The Rietkloof WEF will not result in any changes to the vertical ground profile within the study area; however, the height of the turbines add a secondary visual dimension to the study area which can visually change the topography in the area.	Operation	Negative	**Moderate**	**Moderate**

REF.	RECEIVING ENVIRONMENT	IMPACT DESCRIPTION	PHASE	STATUS	WITHOUT MITIGATION	WITH MITIGATION
G1	Geology	Site preparation will be required in terms of vegetation clearance and bulk earthworks. In addition, concrete foundations will be required for the supporting of the wind turbines.	Construction	Negative	**Low**	**Low**
ASLC1	Agriculture, Soils and Land Capability	Inappropriate storm water design may lead to an increase in surface soil erosion.	Planning and Design	Negative	**Moderate**	**Low**
ASLC2		Increase in renewable energy development in the local area will result in a gradual reduction of available agricultural land over time.		Negative	**Moderate**	**Low**
ASLC3		The development of access roads could result in the loss of irrigated agricultural crop land.		Negative	**Moderate**	**Low**
ASLC4		The planning and design phase of a new wind farm will result in the loss of local soil types.		Negative	**High**	**High**
ASLC5		The potential for soil contamination as a result of hazardous chemical spills and leakages (such as those from vehicles, generators etc.) could lead to soil contamination and a loss of fertile soils if not managed appropriately.	Construction	Negative	**Moderate**	**Low**
ASLC6		Fires originating from the construction site could escape into and burn the natural vegetation leading to the loss of grazing and possibly game and livestock.		Negative	**Very High**	**Low**
ASLC7		During the construction phase, the incorrect stockpiling of the soil horizons (specifically topsoil) could potentially result in a decrease of agricultural viability/potential.		Negative	**Moderate**	**Low**

REF.	RECEIVING ENVIRONMENT	IMPACT DESCRIPTION	PHASE	STATUS	WITHOUT MITIGATION	WITH MITIGATION
ASLC8		Excavations for the construction of the turbines and associated infrastructure will disturb the soil profile. If topsoil becomes buried, or subsoil rock, that is less suitable for root growth, remains at the surface, the agricultural suitability of the soil, that will become available for agriculture again after decommissioning of the WEF, will be reduced.		Negative	**Very High**	**Low**
ASLC9		During the construction phase the WEF infrastructure (permanent and temporary) will result in the loss of low agricultural land.		Negative	**Moderate**	**Low**
ASLC10		Impacted areas and hard surfaces associated with the construction phase will cause and increase in run-off, particularly after rainfall events which could lead to soil erosion.		Negative	**High**	**Low**
ASLC11		During the construction phase the construction of access roads may result in the permanent loss of existing croplands.		Negative	**High**	**Low**
ASLC12		During the operational phase an increase in hard surfaces (hardstands and roads) will increase run-off and potentially lead to soil erosion.	Operational	Negative	**High**	**Low**
ASLC13		During the operational phase the WEF infrastructure will result in the loss of low quality agricultural land.		Negative	**Moderate**	**Low**
ASLC14		The new access roads that will be built for the WEF will allow the landowners and neighbours easier access to farm areas that were previously inaccessible or difficult to access.		Positive	**High**	**High**
ASLC15		During the decommissioning phase the decrease in renewable energy development in the local area will result in an increase of available agricultural land.	Decommissioning	Positive	**High**	**High**
ASLC-C1		Overall Agricultural Soil and Land Capacity cumulative impact	Operational	Negative	**Moderate**	**Moderate**

REF.	RECEIVING ENVIRONMENT	IMPACT DESCRIPTION	PHASE	STATUS	WITHOUT MITIGATION	WITH MITIGATION
BIO1	Natural Vegetation and Animal Life	Impact on vegetation and listed plant species due to transformation within the development footprint	Planning and Construction	Negative	**High**	**Moderate**
BIO2		Faunal impacts due to the construction phase noise and physical disturbance		Negative	**Moderate**	**Moderate**
BIO3		Soil erosion risk as a result of clearing and disturbance within the development footprint and adjacent affected areas		Negative	**Moderate**	**Low**
BIO4		Faunal impacts due to operational activities of the WEF such as noise, and human presence during maintenance activities	Operation	Negative	**Moderate**	**Low**
BIO5		All areas disturbed during construction will remain vulnerable to disturbance for some time into the operational phase and will require regular maintenance to ensure that erosion is minimised.		Negative	**Moderate**	**Low**
BIO6		Disturbed areas are vulnerable to alien plant invasion and it is likely that road verges, crane pads and other cleared or disturbed areas will be foci for the infestation of alien plants. Uncontrolled infestation can result in invasion into the intact rangeland and where woody species are involved, this can result in loss of biodiversity and a decline in ecosystem services.		Negative	**Moderate**	**Low**
BIO7		Faunal Impacts due to Decommissioning Phase activities such as noise and disturbance	Decommissioning	Negative	**Moderate**	**Low**
BIO8		Decommissioning will result in a lot of disturbance which will leave the site vulnerable to erosion.		Negative	**Moderate**	**Low**
BIO9		Decommissioning will leave the site vulnerable to alien plant invasion.		Negative	**Moderate**	**Low**

REF.	RECEIVING ENVIRONMENT	IMPACT DESCRIPTION	PHASE	STATUS	WITHOUT MITIGATION	WITH MITIGATION
BIO-C1		Impact on CBAs and Broad-Scale Ecological Processes due habitat loss and the presence and operation of the facility	Construction and Operational	Negative	**Moderate**	**Low**
BIO-C2		Impact on future conservation options due to development within the Roggeveld Area	Operational	Negative	**Moderate**	**Low**
AV1	Avifauna	Development of the infrastructure footprints inevitably causes the loss of foraging and nesting habitat for most locally resident species of birds.	Planning and Construction	Negative	**Moderate**	**Low**
AV2		Disturbance of avifauna due to construction activities		Negative	**Moderate**	**Low**
AV3		Activities and/or similar presence of intrusive structures cause birds to permanently move away from infrastructure	Operation	Negative	**Moderate**	**Moderate**
AV4		Collision mortality with the turbines		Negative	**Low**	**Low**
AV5		Powerline collision mortality associated with the placement of 33kV Powerlines throughout the project site		Negative	**Moderate**	**Moderate**
AV-C1		Overall Cumulative Avifaunal Impact	Operation	Negative	**Moderate**	**Moderate**
AV-C2		Electrocution		Negative	**Moderate**	**Moderate**
AV-C3		Habitat Destruction		Negative	**Moderate**	**Moderate**
AV-C4		Displacement		Negative	**Low**	**Low**
AV-C5		Collison with various forms of renewable energy infrastructure		Negative	**Moderate**	**Low**
BAT1	Bats	Destruction of bat roosts due to earthworks and blasting	Construction	Negative	**Moderate**	**Low**

REF.	RECEIVING ENVIRONMENT	IMPACT DESCRIPTION	PHASE	STATUS	WITHOUT MITIGATION	WITH MITIGATION
BAT2		Loss of foraging habitat.		Negative	**Low**	**Low**
BAT3		Bat mortalities due to direct blade impact or barotrauma during foraging activities,	Operation	Negative	**High**	**Moderate**
BAT4		Artificial Lighting		Negative	**High**	**Low**
BAT5		Loss of foraging habitat.	Decommissioning	Negative	**Low**	**Low**
BAT-C1		Collison with various forms of renewable energy infrastructure	Operational	Negative	**High**	**Moderate**
SW1	Surface Water	Loss of riparian systems and disturbance of the alluvial water courses in the construction and operational phases.	Construction and Decommissioning	Negative	**Moderate**	**Low**
SW2		Loss of wetlands and wetland function in the construction phase.		Negative	**Moderate**	**Low**
SW3		Increase in sedimentation and erosion in the construction, operational and decommissioning phases. Impacts include changes to the hydrological regime such as alteration of surface run-off patterns which could occur during the construction, operational and decommissioning phases.		Negative	**Moderate**	**Low**
SW4		Potential impact on localised surface water quality during the construction and decommissioning phases		Negative	**Moderate**	**Low**
SW5		Storage of hazardous substances particular in the construction and operational phase		Negative	**Moderate**	**Low**
SW6		Impact on riparian systems through the possible increase in surface water runoff on riparian form and function during the operational and decommissioning phase	Operation and decommissioning	Negative	**Moderate**	**Low**

REF.	RECEIVING ENVIRONMENT	IMPACT DESCRIPTION	PHASE	STATUS	WITHOUT MITIGATION	WITH MITIGATION
SW-C1		Aquatic cumulative impact	Operational	Negative	**Moderate**	**Low**
N1	Noise	Construction activities will cause an increase in ambient noise levels	Construction	Negative	**Low**	**Low**
N2		Operational noise on the surrounding environment	Operational	Negative	**Low**	**Low**
N-C1		Overall cumulative noise impact	Operational	Negative	**Low**	**Low**
V1	Visual	Visual impact during construction due to dust, vehicles and equipment	Construction	Negative	**Moderate**	**Moderate**
V2		Impact of construction camps on visually receptors		Negative	**Low**	**Low**
V3		Impact of wind turbines on visually sensitive points and areas	Operational	Negative	**High**	**High**
V4		Impacts of access roads on visually sensitive receptors		Negative	**Moderate**	**Moderate**
V5		Impact of substations on visually sensitive receptors		Negative	**Low**	**Low**
V6		Visual impact of decommissioning activity	Decommissioning	Negative	**Moderate**	**Moderate**
V-C1		Overall cumulative noise impact	Operational	Negative	**High**	**High**
TT1	Traffic and Transport	Traffic impact as a result of transportation of concrete towers	Construction and Decommissioning	Negative	**Moderate**	**Low**
TT2		Traffic impact as a result of transportation of Steel Towers		Negative	**Low**	**Low**
TT3		Traffic as a result of Operations	Operational	Negative	**Moderate**	**Moderate**
TT4		Traffic impact as a result of Maintenance		Negative	**Low**	**Low**

REF.	RECEIVING ENVIRONMENT	IMPACT DESCRIPTION	PHASE	STATUS	WITHOUT MITIGATION	WITH MITIGATION
H1	Heritage	Impact assessment of destruction of precolonial / stone age material	Construction	Negative	**Very High**	**Moderate**
H2		Impact assessment of the destruction of stone walling features		Negative	**Very High**	**Moderate**
H3		Impact assessment of the destruction of graves		Neutral	**Very High**	**Moderate**
H4		Impact assessment of the destruction of homesteads/ farmhouses		Neutral	**Very High**	**Moderate**
H5		The impact of the construction of the proposed Rietkloof WEF on the cultural landscape		Neutral	**Very High**	**Very High**
H6		The impact of the construction of the proposed Rietkloof WEF on the built environment		Neutral	**Very High**	**Moderate**
H-C1		The construction of the proposed Rietkloof WEF and cumulative impacts on heritage resources		Negative	**Very High**	**Moderate**
P1	Palaeontology	Disturbance, damage or destruction of fossil heritage during the construction phase of the WEF	Construction	Negative	**Moderate**	**Low**
P-C1		Disturbance, damage or destruction of fossils (direct, negative impacts) preserved at or beneath the ground surface within the development footprint		Negative	**Moderate**	**Low**
SE1	Social	Creation of Employment Opportunities	Construction	Positive	**Moderate**	**Moderate**
SE2		Technical advice on wind energy to local farmers and municipalities		Positive	**N/A- *represents the status quo***	**Moderate**
SE3		Presence of construction workers on local communities		Negative	**Moderate**	**Moderate**

REF.	RECEIVING ENVIRONMENT	IMPACT DESCRIPTION	PHASE	STATUS	WITHOUT MITIGATION	WITH MITIGATION
SE4		Influx of job- seekers		Negative	**Moderate**	**Moderate**
SE5		Increased risks to livestock and farming infrastructure associated with the construction related activities and presence of construction workers on the site		Negative	**Moderate**	**Moderate**
SE6		Increased risk of grass fires		Negative	**Moderate**	**Low**
SE7		Noise, dust, waste and safety impacts associated with construction related activities and vehicles		Negative	**Moderate**	**Low**
SE8		grazing and productive farmland		Negative	**Moderate**	**Low**
SE9		Impact on tourism		Positive	**Low**	**Low**
SE10		Creation of employment and business opportunities	Operational	Positive	**Moderate**	**Moderate**
SE11		Generation of income for farmers		Positive	**Moderate**	**Moderate**
SE12		Benefits associated with the establishment of a community trust		Positive	**Moderate**	**High**
SE13		Development of infrastructure for the generation of clean, renewable energy		Positive	**Moderate**	**High**
SE14		Visual impacts and associated impact on sense of place		Negative	**Moderate**	**Moderate**
SE15		Impact on tourism		Negative	**Moderate**	**Moderate**
SE16		Impacts associated with decommissioning	Decommissioning	Negative	**Moderate**	**Low**
SE-C1		Cumulative Impact on Sense of Place	Operational	Negative	**Moderate**	**Moderate**

REF.	RECEIVING ENVIRONMENT	IMPACT DESCRIPTION	PHASE	STATUS	WITHOUT MITIGATION	WITH MITIGATION
SE-C2		Cumulative Impact on Local Services and Accommodation	Operational	Negative	**Moderate**	**Moderate**
SE-C3		Cumulative Impacts on Local Economy	Operational	Positive	**Moderate**	**High**

5 FINDING OF THE SPECIALIST WALKDOWNS – 2021

5.1 AGRICULTURAL

An Agricultural Assessment of the WEF Layout and adequacy of the EMPr in terms of the Rietkloof WEF's impacts on agricultural resources was undertaken by Johann Lanz. It is noted that all land that is excluded from agricultural use by the proposed development is entirely unsuitable for crop production due to very significant climate constraints. This land is not considered preservation-worthy as agricultural production land.

The Rietkloof layout is almost entirely on land of very low potential which is rated as low agricultural sensitivity. A small part is located on medium sensitivity and it entirely avoids any land that is rated more than medium sensitivity, and that would therefore be a higher priority in terms of its conservation for agricultural land use. The layout is therefore acceptable in terms of agricultural impact.

The important aspects of consideration in terms of the EMPr in order to protect agricultural resources are erosion prevention and maintenance of topsoil on the surface. The Assessment notes that these aspects are adequately covered in the assessed EMPr, and therefore no amendments or additions are recommended to the EMPr.

The Agricultural Walkdown Report is included in **Appendix K.**

5.2 TERRESTRIAL ECOLOGY & BIODIVERSITY

Trusted Partners was commissioned to undertake and ecological site walkdown for the proposed Rietkloof WEF. Several Species of Conservation Concern (SCC), in addition to those identified during the initial ecological assessment, were identified during the 2021 walkdown. These species are classified as either Critically rare (CR), Vulnerable (VU), Near Threatened (NT), Rare (R), or Endangered (E), The identified floral species of conservation concern include *Antimima androsacea* (CR), *Antimima loganii* (VU), *Brunsvigia josephinae* (VU), *Euryops sulcatus* (VU), *Geissorhiza karooica* (NT), *Indigofera hantamensis* (R), *Lotononis venosa* (E), *Romulea eburne* (VU), *Romulea hallii* (VU), *Romulea syringodeoflora* (NT).

Sensitive areas identified either during the initial ecological assessment and/or observed during the 2021 walkdown include the following (a summary of which is detailed in Table 9 of the Terrestrial Ecology & Biodiversity Walkdown Report (included in **Appendix I**) and Section 5.11 below):

- Rocky Outcrops and Ridges on slopes and mountain peaks;
- Rivers, seeps, wetlands and pans; and
- Sub-population of flagged species of conservation concern.

The applicable recommendations made based on the findings of the walkdown, have been included in Section 5.11 below as well as included in the mitigation measures contained in Section 8.6 of this EMPr.

5.3 SURFACE WATER

A freshwater ecological assessment as part of the water use authorisation process for the proposed Rietkloof WEF was undertaken by Freshwater Ecologist Network (FEN) Consulting (Pty) Ltd. The assessment indicates that a large drainage network of ephemeral watercourses, associated with the Groot, Roggeveld, Muishond and Wilgebos Rivers were identified as well as various Channelled Valley Bottom Wetlands. Majority of these watercourses are considered to be in a largely natural to moderately modified ecological condition and of high ecological importance and sensitivity.

Findings of the assessment indicate that only the access road crossings will directly impact on the watercourses. All other proposed infrastructure will be located outside of the delineated extent of the watercourses; however,

some will be located within the 100 m regulated area. Seven crane pads and the construction camp are located below/partially within the 100m GN509 Zone of Regulation (ZoR). Crane pads associated with turbines 28 and 69 are located the closest to watercourses (approximately 36 m and 26 m respectively). The proposed overhead collector powerlines will directly traverse watercourses, however, as far as feasible, all powerline support structures will be located at least 32 m from the delineated extent.

It was determined that the proposed development will have a Negative Moderate to Low risk significance on the watercourses with implementation of mitigation measures. A direct negative risk to the watercourses is expected due to the upgrading of watercourse crossings and the upgrading of an extensive section of access road located adjacent to a channeled valley bottom wetland and the Groot River.

Based on the findings of the assessment, no fatal flaws from a freshwater resource management point of view were identified. With adherence to cogent, well-conceived and ecologically sensitive construction plans and the implementation of the mitigation measures provided in freshwater ecological assessment report and provided that general good construction practice is adhered to, from a freshwater conservation perspective the proposed development is considered acceptable. The mitigation measures recommended in the report have been incorporated into this EMPr. The freshwater assessment report further states that authorisation by means of a Water Use Licence Application (WULA) in terms of Sections 21 (a), (c) and (i) of the National Water Act, 1998 (Act No. 36 of 1998) must be obtained from the Department of Water and Sanitation (DWS) prior to the commencement of any works.

The Surface water walkdown letter is included in **Appendix L**.

5.4 BIRDS

Birds and Bats Unlimited was commissioned to undertake the Avian Re-assessment for turbines proposed for the Rietkloof wind energy development area as well as the required additional 6-month pre-construction monitoring, with monitoring site visits being undertaken in July and November 2021 (the results of which have been taken into consideration in the EMPr).

The avian component was previously surveyed in 2016. The avian re-assessment entailed a short re-assessment of the priority raptors, undertaken in May 2021, to determine if the receiving environment has changed, as well as to summarise the avian impacts of the previous avian assessment report compiled in 2016. The May 2021 survey revealed more species than recorded previously and a Passage Rate fourfold higher (at 0.32 eagles per hour) than in 2016. The re-assessment located a second Verreaux's Eagle nest site (in addition to the one identified in 2016) in the south-western corner of the Rietkloof site, on a large south-facing cliff. The two nests were observed to be attended by an adult during the May 2021 survey. Additional priority birds observed were Ludwig's Bustard *Neotis ludwigii* and Greater Flamingo *Phoenicopterus roseus*. These are Red Data species.

A 3-km buffer around both Verreaux's Eagle nests on site is recommended, in line with the present eagle guidelines (Ralston Paton 2017). It is noted that eleven turbines of the authorised 60 turbine positions occur within the 3-km buffer and four of these lie within 2016 recommended 1.5-km buffer around the Verreaux's Eagle nest. This would result in the repositioning of the eleven turbines (Turbines R01, R02, R03, R04, R05, R06, R07, R09, R10, R11, R12) away from the nest. Additionally, two of the turbines (Turbines R01, R02) that lie outside of the 1.5-km buffer and directly east of the nest appear to lie on the flight paths of eagle flights observed during the 2021 survey.

During the November 2021 site inspection it was confirmed that the Black Harrier nest suspected by African Insights (2013) is active. The nest is located on the Brandvalley WEF site, but the recommended 3-5 km buffer of this nest just overlaps the Rietkloof WEF. The nearest turbine (R20) on Rietkloof is 4.9-km away, marginally inside the recommended 5-km buffer of the Birdlife South Africa Black Harrier guidelines. Given the marginal nature of this distance we do not believe this turbine offers much risk to the breeding birds here. In the Northern section of the wind farm, where three turbines occur in the revised layout for the WEF, multiple flights of Black Harriers were recorded in July 2021.

The final layout takes cognisance of the above avian assessments and Turbine positions R01 to R14, have been removed, to reduce environmental impacts and risk to Verreaux's Eagles. Furthermore, this will avoid construction of significant lengths of site roads adjacent to watercourses. Therefore, all the turbines requiring repositioning have been removed from the final layout. The below summary table only includes findings

associated with the remaining 47 turbines and therefore the findings applicable to the removed turbines have not been included in the table.

To mitigate potential impacts on the Black Harrier, the following is recommended that in the event the client has the opportunity to drop additional turbines from the authorised layout in the future, that they do so from the northern ridge, that is: turbines R30, R31, R32, R33. If this compromises the energy yield of the wind farm, then these four turbines can remain, but they should be mitigated with striped-blade mitigation and/or automated shut down on demand (SDOD), or observer-lead SDOD.

In an effort to further mitigate any impacts to priority birds, the avian re-assessment recommends the following:

(i) Erecting the turbines with red-, or black-blade, mitigation (painted before installation) to increase turbine visibility for the eagles (May et al. 2020).

(ii) The advantages of this mitigation are that:

(a) raptors see best in colour;

(b) 'signal red' is already approved by South African Civil Aviation for towers and other tall structures;

(c) blade manufacturers such as Siemens and Vestas already produce painted blades in Europe; and

(d) this mitigation has no running costs.

www.engineeringnews.co.za/article/opinion-black-blade-mitigation-a-new-and-exciting-mitigation-for-wind-turbines-to-reduce-impacts-to-birds-of-prey-2020-10-09/

(iii) Should painted blades be ineffective, additional mitigations should include automatic shut-down on demand with systems such as DT-Bird and Multi-seco.

The Avifauna Walkdown Report is included in **Appendix G**.

5.5 BATS

Animalia Consultants conducted an assessment of the turbine layout, including on-site verification, in relation to impacts on bats, for the proposed Rietkloof WEF. According to the verification assessment, the proposed turbine layout is in line with the bat sensitivity map as was applicable during the preconstruction guidelines that was in use during the EIA assessment and subsequent amendments. It also respects the current guideline criteria which requires turbine blade length to be outside the high sensitivity buffers, except for Turbines R27, R37 and R49. It is noted that the larger rotor diameter (180m) effectively brings the impact zone of each turbine closer to all bat sensitivity buffers, and no part of the turbine (including the turbine blades) is allowed to intrude into high bat sensitivity buffers. The verification assessment recommends that Turbines R27, R37 and R49 base centre points should be moved to be outside of the high bat sensitivity buffer in the event that a turbine with a 180m rotor diameter is utilised. All other turbines proposed can remain in the currently authorised positions.

A map of the bat sensitivity associated with the Rietkloof turbine layout WEF is shown below. It is important to note that the assessed final layout is acceptable from a bat sensitivity perspective if all conditions of the EA are complied with, an operational bat impact monitoring study is conducted for a minimum of 2 years, and Turbines R27, R37 and R49 are relocated outside of the high bat sensitivity buffer (in the event that a turbine with a 180m rotor diameter is utilised).

The Bat Walkdown Letter is included in **Appendix H.**

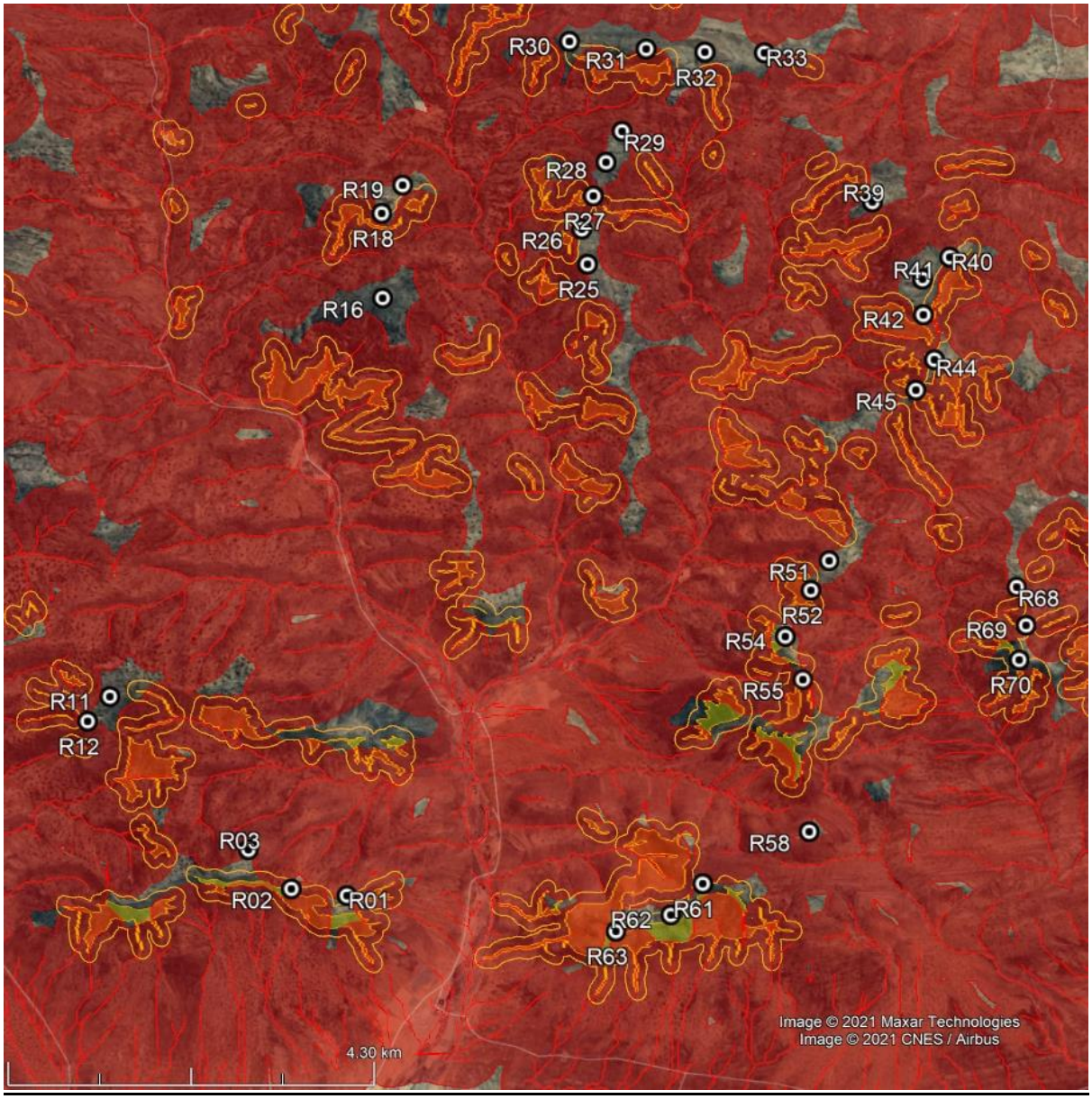


Figure 5-1: Bat sensitivity map of the Rietkloof site with proposed turbine layout (Animalia, 2021).

5.6 VISUAL

An assessment of the proposed layout changes for the proposed Rietkloof WEF from a visual perspective was undertaken by SiVEST. It has been established, via desktop assessment using Google Earth imagery, that although the landscape to the north of Rietkloof WEF is undergoing significant change as a result of the development of the Roggeveld WEF, there has been little change since 2018 in the baseline characteristics and the number of sensitive receptors across the remainder of the study area. While an increase in the height of the turbines would increase the visibility of the WEF, a GIS-based visibility analysis has shown that, in this instance the increase in visibility would be marginal. Visual impacts resulting from the larger turbines would be greatest within a 1km to 2km radius, from where the increased height of the structure would be most noticeable. However, no potentially sensitive receptors were identified within 2km of a wind turbine placement, and the larger turbines as proposed are not expected to increase the impacts experienced by any of the identified receptors.

In addition, the change in the turbine specifications being proposed for the Rietkloof WEF has allowed for a reduction in the number of turbines required for the facility. Fewer turbines will result in a slight reduction in the

area from which the turbines will be visible (viewshed) there will be less visual clutter in the landscape resulting in a slight reduction in the cumulative impacts experienced.

Based on the above, and the limited human habitation and relatively remote location of the proposed Rietkloof WEF, the proposed changes in the turbine specifications are not expected to result in any increased visual impacts on the identified receptors, or affect any additional receptors in the surrounding area. Furthermore, no additional visual impacts or changes in the significance of impacts identified in the previous VIA are anticipated as a result of the updated WEF layout (final layout).

Consideration was also given to the Landscape and Flicker Themes of the National Environmental Screening Tool. According to the Screening Tool, Very High and High sensitivity ratings were applied to the project area, associated with the presence of natural features such as mountain tops, high ridges and steep slopes. Based on these criteria, a significant portion of the site would be ruled out for WEF development. However, the Screening Tool is very high level desktop study, and the results of the study must be viewed against factors affecting visual impact, including the presence of visual receptors, distance of receptors from the proposed development and the likely visibility of the development from the receptor locations. Based on the findings of the original VIA as well a high level Google Earth scan, it has been determined that many of the receptors identified by the Screening Tool are not in fact receptors. In addition, potential impacts resulting from shadow flicker were assessed in the previous VIA for the Rietkloof WEF and it was concluded that although there are a few buildings within 500m of a wind turbine, none of these are occupied and the proposed layout is not expected to result in any flicker impacts affecting the identified receptors.

It is SiVEST's opinion is that the proposed amendment to the turbine specifications and the updated layout do not give rise to any additional impacts or exacerbate the impacts previously identified in the VIA for this development. According to the 2021 visual assessment undertaken by SiVEST, no additional mitigation measures or specialist input into the EMPr are deemed necessary. It is important to note that the site layout is deemed acceptable from a visual perspective. This is in view of the low level of human habitation and the relative absence of sensitive receptors in the area.

The Visual specialist statement is included in **Appendix M.**

5.7 HERITAGE

A detailed heritage walkdown and micro-siting of the final layout for the Rietkloof WEF was undertaken by CTS Heritage between 24 and 28 July 2021. The final development footprint was assessed to determine archaeological resources likely to be impacted by the approved development. All of the heritage resources identified in the Heritage Impact Assessment (HIA), completed in 2016, have been recorded on SAHRIS and mapped relative to the final proposed layout. The final layout for the Rietkloof WEF avoids impact to all known significant heritage resources present within the development area. The walkdown of the final layout revealed no new significant heritage resources that are likely to be impacted.

It is noted that the palaeontological impact assessment (PIA) conducted for the project concluded that the majority of the Rietkloof WEF study area is of low palaeontological sensitivity. This is due to due to the scarcity of significant fossil vertebrate, plant and other remains here. Sensitive no-go areas within the proposed development footprint itself have not been identified in this study. The concentration of blocks and logs of well-preserved petrified wood from the Waterford Formation that are exposed on the slopes of Kranskop, Wilgehout Fontein 87 constitute a notable exception. This highly sensitive area, which in fact lies outside the proposed WEF development footprint, should not be disturbed. Pending the potential discovery of substantial new fossil remains during construction, specialist palaeontological mitigation is only recommended within two narrow upland areas of Waterford Formation outcrop close to Kranskop. The assessment notes two areas of very high levels of palaeontological sensitivity (indicated Figures 4.2 and 4.3 of the Heritage Walkdown Report) where no impact is permitted in these areas. Furthermore, the areas marked as having high levels of palaeontological sensitivity (indicated in Figures 4.2 and 4.3 of the Heritage Walkdown Report) should be inspected for fossil wood occurrences by a professional palaeontologist.

The locations of recordings made during the previous studies were included in the planning of the walkdown to ensure that additional ruins and historical infrastructure wasn't overlooked due to potential changes in the layout of the final design of the WEF and access roads. The heritage walkdown located one fairly large stone walled kraal (in addition to the ruins and historical infrastructure identified in 2016) during the survey. With the exception of this site, no other obvious omissions were found during the survey of the Rietkloof WEF and the coverage

along existing jeep tracks and gravel farm roads was therefore deemed to have adequately recorded the historical archaeology and built environment heritage of the area. Stone Age sites were expected to be very scarce, and this was borne out yet again in the foot survey of the ridges where the WEF roads and turbine positions have been planned. Only a few isolated Later and Middle Stone Age sites were located, and the artefacts showed signs of retouch, especially on flakes derived from chert. These locations have therefore been interpreted as representing temporary hunting and foraging locales taking advantage of the wide views down onto the valleys either side of the ridges. Less than 1% of the overall archaeological material found in the area is therefore located on the ridges that are windswept, highly rocky and difficult to move through on foot. No overhangs or even substantial outcrops of boulders providing natural shelter were found on the ridges.

The mitigation measures recommended in the heritage walkdown report have been incorporated into this EMPr.

The Heritage Walkdown Report is included in **Appendix J.**

5.8 TRAFFIC

A Traffic Impact Assessment (TIA) was undertaken by JG Afrika as part of the amendment and update of the EMPr process for the proposed Rietkloof WEF. The TIA aimed to review the proposed traffic impacts and mitigations as assessed in the May 2016 TIA and to ensure that any traffic impacts associated with the final site layout are considered and mitigated accordingly.

It is noted that the preferred port of entry to the site is the Port of Saldanha. This route maximises the use of higher order routes, which are designed to handle / accommodate larger vehicles and minimise travelling through towns as far as possible. This was deemed important to minimise congestion and avoid disruptions to communities in these towns. The delivery company is advised to conduct a dry-run of the route to determine the practical suitability of the route for abnormal load travel.

The TIA notes that no capacity improvements are considered necessary based on the following:

- The site gains access of the R354, which is a Class 2 road designed to accommodate large traffic volumes.
- The only notable generated traffic would occur during the construction and decommissioning phases. The trips generated during these phases will only occur for short periods of time and the following mitigation measures are recommended for consideration:
    - The delivery of wind turbine components to the site can be staggered and trips can be scheduled to occur outside of peak traffic periods,
    - The use of mobile batching plants and any material sources in close proximity to the site would decrease the impact on the surrounding road network,
    - Staff and general trips should can outside of peak traffic periods,
    - Staff can be shuttled on scheduled busses to minimise the number of trips; and
    - Stagger the removal of turbines, foundations, crane pads etc during the decommissioning phase.

The development of the Rietkloof WEFis supported from a traffic engineering point of view, provided that the recommendations in the TIA report are adhered to and are read in conjunction with the road design and environmental reports completed for this site. The recommendation measures of the TIA and Traffic Management Plan (**Appendix C**) are incorporated into this EMPr for implementation.

5.9 SOCIAL

An EMPr Summary of key social issues and recommendations, based on a site visit to the study area, was undertaken by Tony Barbour Environmental Consulting, as part of the Social Impact Assessment for the Rietkloof WEF. The site visit consisted of interview and discussions held with a number of landowners and community members affected by the proposed WEF and associated powerline. In addition, the affected landowners provided insight into their experience with the construction phase of other WEF's in the area. The Summary of key issues is also informed by other public meetings attended associated with other proposed Solar Energy Facilities (SEF), with inputs from landowners in the vicinity of an existing WEF. The issued raised in these previous meeting are considered to likely be relevant to the Rietkloof WEF due to its location within the Komsberg REDZ.

A number of interviewees highlighted the positive impacts that the ongoing construction of WEFs in the Komsberg REDZ have on the local economy in the area. These include the benefits that the construction activities have on the local hospitality, retail and services sector. It is noted that early, effective and on-going communication was highlighted as a key issue that needs to be implemented and/or addressed to manage impacts associated with the WEFs. Other impacts highlighted by the landowners affected by existing WEFs were attributed to extensive land clearance, damage to farm infrastructure such as gates and a concern on crime and security (although not directly linked to the WEFs). Other issues of concern included potential increases of Sexually Transmitted Diseases, unplanned pregnancies, reduced availability of accommodation for visitors and limited benefits to the local farming community. Impact on sense of place and visual impacts were also highlighted as potential issues for consideration and subsequent mitigation.

Based on the above, a number of recommendations have been made for inclusion in the planning and implementation of construction related activities, to minimise social impacts, impact footprint and avoid unnecessary disturbances. These measures have been incorporated into the EMPr and steps must be taken to ensure implementation on the ground.

This summary is included in **Appendix N**

5.10 DESKTOP GEOTECHNICAL

A geotechnical desktop level study was undertaken by JG Afrika for the proposed Rietkloof WEF. The aim of the study was to assess the geological and geotechnical conditions across the study area, and to provide information on the topographical feasibility of the site for the proposed project, as well identify the geological and geotechnical influences and/or constraints on the construction structures.

According to the study the slope gradient map indicates that the turbines are located on gentle slope. The turbines are flanked by steep slopes on the southern portion of the site. The substation and the construction camp site are located on flat terrain. The majority of the internal access roads are characterised by flat to gentle slope along the lower lying valley areas and steep terrain characterises the slope sides.

It is however noted that based on previous investigations in the greater Roggeveld area, the site is anticipated to be underlain by shallow bedrock conditions. Competent, founding conditions can be anticipated in shallow, slightly weathered bedrock conditions, which will have to be assessed during the detailed investigation prior to construction.

Recommendations, in terms of foundations types for the various infrastructure associated with the project is included in report for consideration by the Developer. No fatal flaws from a preliminary geotechnical perspective were identified during the desktop study. The impact will be restricted to the removal and displacement of soil, boulders and bedrock. The potential impact of the development on the terrain and geological environment will be the increased potential for soil erosion, caused by construction activities and the removal of vegetation. Additionally, the aesthetic impact is considered significant due to the required extensive earthworks associated with the project to meet the required horizontal and vertical alignments and curvatures for roads., so the aesthetic impact is significant. The anticipated impact of the proposed project will have negative effects from a geotechnical perspective and will require mitigation. The mitigation measures suggested in the study have been incorporated into this EMPr.

Areas with steep slope inclinations are not recommended for the energy developments due to the earthworks requirements and the potential need for advanced foundations. The proposed site is considered suitable for the proposed development, provided that the recommendations presented in the geotechnical desktop study report are adhered to and which need to be verified by more detailed geotechnical investigations during detailed design.

This assessment is included in **Appendix O.**

5.11 WALKDOWN SUMMARY

Subsequent to the merged EA issued and during the final layout development and preliminary design and micrositing, several amendments have been proposed for the Rietkloof WEF project, including reducing the number of turbines from the authorised 60 to 47 turbine positions.

Positions R01-R14 have been omitted to reduce environmental impacts and to address constructability challenges identified during preliminary design. The final number of turbine positions will be determined from the remaining 47 positions assessed by the Specialists as part of the walkdowns and review of the 2018 findings. The below summary table only includes findings associated with the remaining 47 turbines included in the final layout.

It should be noted that the final number of turbine positions utilised will be dependant on the turbine manufacturer chosen to supply the turbines. This decision could see the final number of turbines required for the Rietkloof WEF to be reduced again prior to the commencement of construction.

Table 5-1 provides a summary of the recommendations made as a result of the specialist walkdowns. Only those aspects are turbine positions where recommendations are applicable have been included. It can be noted that the following specialists made no specific recommendations pertaining to the 47 turbine positions in the Final Layout:

- Agriculture;
- Visual;
- Traffic;
- Social; and
- Geotechnical.

Figure 5-2 and **Figure 5-3** illustrate the sensitivity map for the development area overlain by the Final site layout for the Rietkloof WEF. A3 versions of the maps have been included in **Appendix B**.

Table 5-1: Walkdown Summary of Recommendations

TURBINE NUMBER / OTHER INFRASTRUCTURE	TERRESTRIAL ECOLOGY AND BIODIVERSITY	SURFACE WATER	BIRDS	BATS	HERITAGE
R15					
R16					
R17					
R18					
R19					
R20			Turbine position falls on the 5km buffer for active Black Harrier Nest. The turbine does not need to be moved as long as the relevant mitigation measures are implemented.		
R21					
R22					
R23		Crane pad associated with Turbine 23, located approximately 92 m from a watercourse.			
R27				Blades are intruding into the high bat sensitivity buffer. Turbine base centre point should be relocated outside of the high bat sensitivity buffer. These turbines will be micro-sited in the event that turbines with a 180m rotor diameter are utilised.	

TURBINE NUMBER / OTHER INFRASTRUCTURE	TERRESTRIAL ECOLOGY AND BIODIVERSITY	SURFACE WATER	BIRDS	BATS	HERITAGE
R28		Crane pads located the closest to watercourses (approximately 36 m)			
R37	Protected species *Brunsvigia josephinae* present. Search and rescue will be required prior to construction.			Blades are intruding into the high bat sensitivity buffer. Turbine base centre point should be relocated outside of the high bat sensitivity buffer.	
R40					
R41					
R44					
R45					
R46					
R48		Crane pad associated with Turbine 48, located approximately 75 m from a watercourse.			Turbine positions should be inspected for fossil wood occurrences by a professional palaeontologist prior to construction.
R49		Crane pad associated with Turbine 49, located approximately 99 m from a watercourse.		Blades are intruding into the high bat sensitivity buffer. Turbine base centre point should be relocated outside of the high bat sensitivity buffer.	
R50					
R51					
R52					
R54					

TURBINE NUMBER / OTHER INFRASTRUCTURE	TERRESTRIAL ECOLOGY AND BIODIVERSITY	SURFACE WATER	BIRDS	BATS	HERITAGE
R55	Located adjacent to Rocky Outcrops. The outcrops should be avoided as far as possible during final surveying and pegging out.				
R59		Crane pad associated with Turbine 59, located approximately 79 m from a watercourse.			
R63		Crane pad associated with Turbine 63, located approximately 88 m from a watercourse.			
R66					Turbine positions should be inspected for fossil wood occurrences by a professional palaeontologist prior to construction.
R67					
R68	Located adjacent to Rocky Outcrops. The outcrops should be avoided as far as possibly during final surveying and pegging out.				
R69		Crane pad located the closest to watercourses (approximately 26 m)			
R70					
Site camp/construction camp		Located 48 m from the Roggelveld River (thus within the 100m GN509 ZoR.			

TURBINE NUMBER / OTHER INFRASTRUCTURE	TERRESTRIAL ECOLOGY AND BIODIVERSITY	SURFACE WATER	BIRDS	BATS	HERITAGE
North-western access road (MR 8041- proposed to be upgraded)	North-western access road passes multiple times through and along seep area multiple times. Access road should be realigned.	Located directly adjacent to the wetlands associated with the Groot River systems.			
Western access road (MR 6159 - proposed to be upgraded)	The western access road passes through and along a well-defined watercourse with large *Brunsvigia josephinae* population present within the riparian vegetation and directly adjacent to the watercourse. The access road should be aligned as far from watercourse as possible and should not extend closer to watercourse than inner side of the existing access track.	Located directly adjacent to the wetlands associated with the Groot River systems.			
Southern access road	Wetland pan near western site camp to be fenced to avoid being used for vehicle turning. Road passes through diverse area on south facing slope with large number of species.				
Broader Area	The species *Antimima androsacea* was found to occur at low densities throughout a broader area as indicated; due care to be taken during construction to avoid impact to this species.				
Borehole		Located 48 m from the Roggelveld River (thus within the 100m GN509 Zone of Regulation (ZoR).			

TURBINE NUMBER / OTHER INFRASTRUCTURE	TERRESTRIAL ECOLOGY AND BIODIVERSITY	SURFACE WATER	BIRDS	BATS	HERITAGE
Collector system – Option 1, 2 and 2		Several watercourse crossings: (It must be noted that all powerline support structures will be constructed outside of the delineated extent of the watercourses and as far as feasible, at least 32 m from its delineated extent and therefore are not considered to pose a direct negative risk to the delineated watercourses).)			

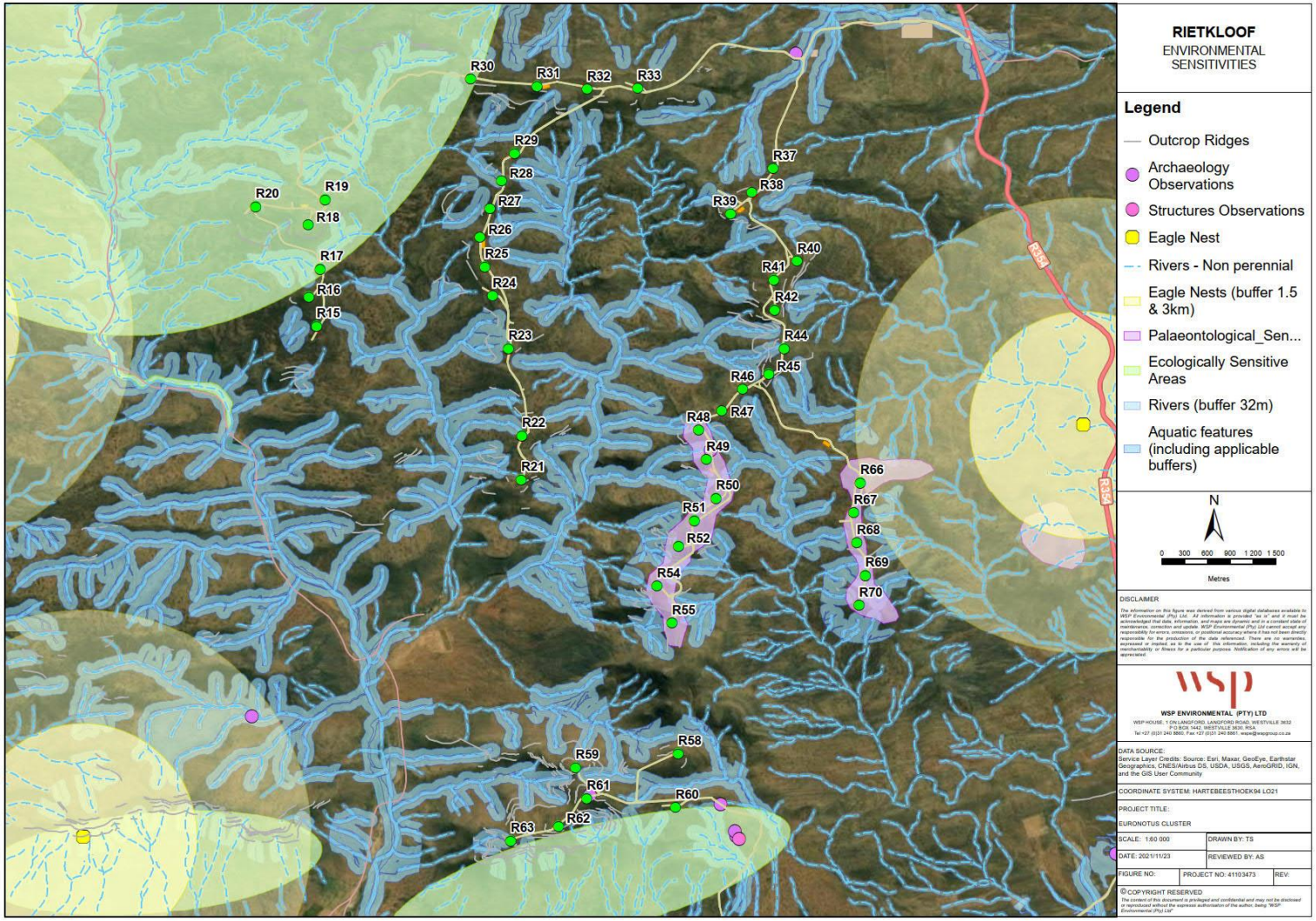


Figure 5-2: Environmental sensitivity map overlain over the Final Riekloof WEF Layout

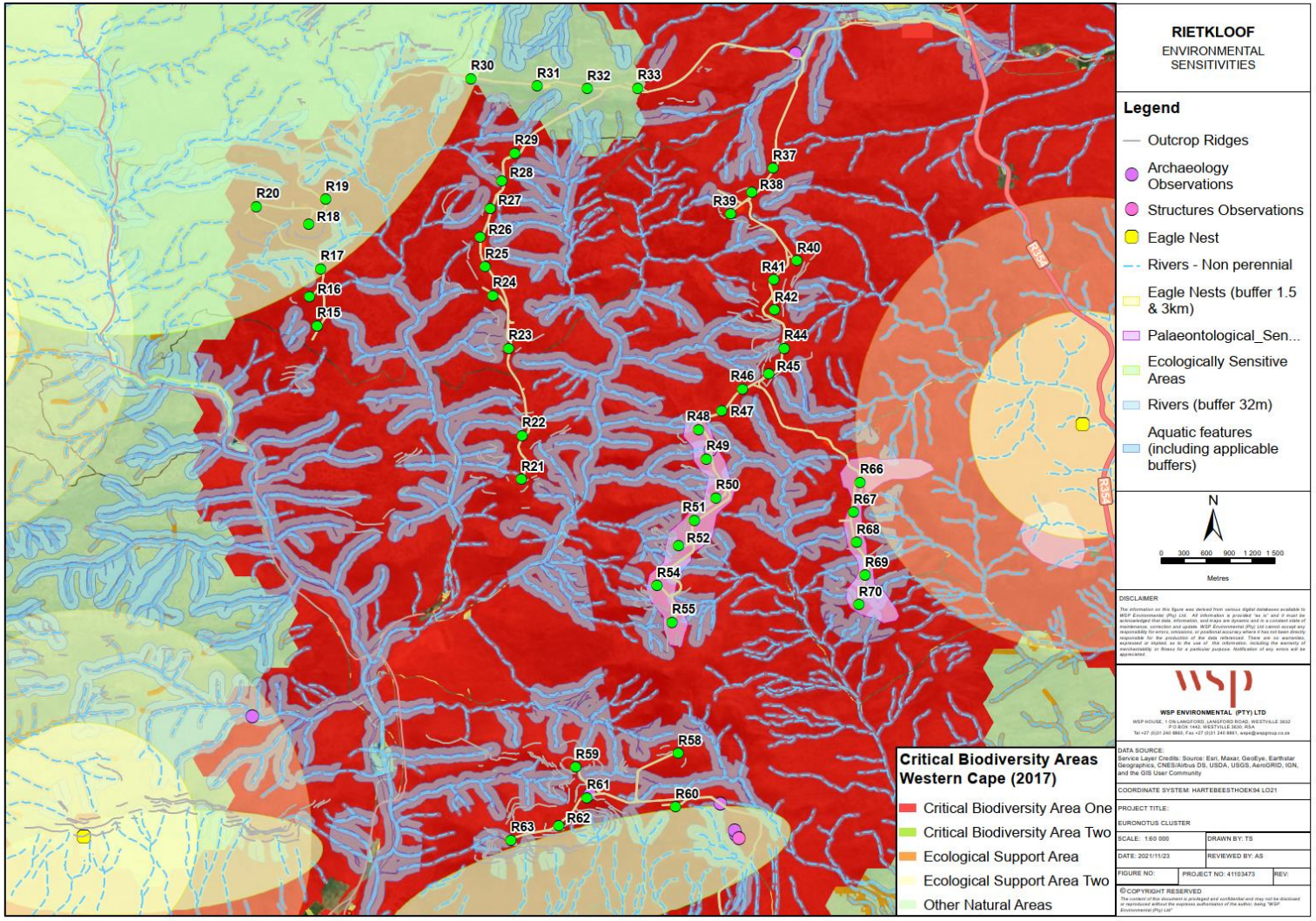


Figure 5-3: Environmental sensitivity map overlain over the Final Riekloof WEF Layout (inclusive of CBAs)

6 ENVIRONMENTAL MANAGEMENT OUTCOMES

An EMPr is defined as "an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented or mitigated, and that the positive benefits of the projects are enhanced."

This EMPr has been compiled in accordance with Appendix 4 of GNR 326, in compliance with section 24N of NEMA, with the purpose of ensuring that negative impacts are reduced, and positive effects are enhanced through a process of continual improvement, during both the construction and operational phases of the proposed Rietkloof WEF.

Due to the nature of the continual improvement process, this EMPr is seen as a working document and is therefore subject to change depending on the requirements of the various project phases. These changes are to be approved in line with the prevailing legislation and conditions of the EA.

This EMPr has the following outcomes:

- Identify mitigation measures and environmental specifications which are required to be implemented for the planning, construction and rehabilitation, operation, and decommissioning phases of the project to manage and minimise the extent of potential environmental impacts associated with the facility;
- Ensure that all the phases of the proposed project do not result in undue or reasonably avoidable adverse environmental impacts, and ensure that any potential environmental benefits are enhanced;
- Identify entities responsible for the implementation of the measures and outline functions and responsibilities;
- Create management structures that address the concerns and complaints of interested and affected parties (I&APs) with regards to the proposed project;
- Propose mechanisms and frequency for monitoring compliance, and preventing long-term or permanent environmental degradation; and
- Facilitate appropriate and proactive responses to unforeseen events or changes in project implementation that was not considered in the BA Process.

To facilitate compliance to the EMPr by appointed contractors and sub-contractors, it is required that all onsite personnel are aware of the requirements of the EMPr as well as the prescribed penalties should a non-conformance be identified during the construction, operation and decommissioning activities.

Further to the above, appointed contractors and sub-contractors will also be required to comply with all relevant legislation and standards.

It is recommended that environmental and social outcomes (as outlined in this document) be emphasised to the appointed contractors and sub-contractors as minimum requirements. Outcomes should include:

- Prevention of hazardous spillages/leaks or incidents onsite for the duration of the construction and operation periods. This should include the use of construction vehicles and plant equipment, as well as material storage;
- Addressing any complaints from the surrounding land users timeously for the duration of the construction and operation periods;
- Prohibition of waste from remaining onsite for extended periods. Skips and waste receptacles need to be appropriately labelled, covered and regularly emptied;
- Reduction of waste generation;
- Mitigation against dusty conditions as much as is practicable;
- Maintenance of site aesthetics throughout the construction and operational period;
- Utilisation of natural resources sustainably;
- Completion of work (to the required standard) timeously and prevention of work outside the legislated working hours; and

– Management of activities according to a philosophy of "We respect the environment" and "We are committed to continually improving our processes to prevent pollution".

7 MANAGEMENT PROCEDURES AND ADMINISTRATIVE REQUIREMENTS

7.1 ORGANISATION, STRUCTURE AND RESPONSIBILITY

Formal responsibilities are necessary to ensure that key management measures/procedures are executed. Rietkloof Wind Farm (RF) (Pty) Ltd, the Holder of the EA, will be responsible for the overall control of the project site during the pre-construction, construction, operation, decommissioning and rehabilitation phases of the project. Rietkloof's responsibilities will include the following:

- Appointing an independent environmental control officer (ECO) for the duration of the Construction phase and to notify the DFFE of their contact details, in line with Condition 21 of the EA;
- Being fully familiar with the BA Report, EA conditions and the EMPr;
- Applying for an amendment of the EA from the DFFE in the event that the approved scope changes in line with the prevailing legislation;
- The overall implementation of the EMPr;
- Ensuring compliance, by all parties, and the imposition of penalties for noncompliance;
- Implementing corrective and preventive actions, where required;
- Preventing pollution and actions that will harm or may cause harm to the environment;
- Ensuring the activity does not commence within 30 days of the EA being issued;
- Notifying the DFFE within 14 days that construction activity will commence;
- Notifying the DFFE in writing within 24 hours if any condition in the EA cannot be or is not adhered to;
- Notifying the DFFE should minor changes to the layout be required (as confirmed by the Environmental Onsite Compliance Officer (ESCO) and ECO); and
- Notifying the DFFE 14 days prior to commencement of the operational phase.

Specific roles and responsibilities for the construction phase of this project are as defined in **Table 7-1** below.

Table 7-1: Roles and Responsibilities- Construction

RESPONSIBLE PERSON	RESPONSIBILITIES
Holder of the EA	– The Holder of the EA shall take overall responsibility for the adherence to the EMPr and EA conditions.
Project Manager	– Ensure Rietkloof and the contractor(s) are aware of all specifications, legal constraints pertaining to the project specifically with regards to the environment; – Ensure that all stipulations within the EMPr and conditions of the environmental authorisation are communicated and adhered to by Rietkloof and its contractor(s); – Monitor the implementation of the EMPr and conditions of the environmental authorisation throughout the project by means of site inspections and meetings. This will be documented as part of the site meeting minutes; and – Be fully conversant with the BAR for the project, the conditions of EA and all relevant environmental legislation.
Site Manager	– Be fully conversant with the BAR, the conditions of EA and the EMPr; – Approve method statements (co-approval with ESCO); – Provide support to the ESCO; – Be fully conversant with all relevant environmental legislation and ensure compliance thereof;

RESPONSIBLE PERSON	RESPONSIBILITIES
	– Be responsible for the implementation of the EMPr and conditions of the EA; – Ensure that audits are conducted to ensure compliance to the EMPr and conditions of the EA; – Liaise with the Project Manager or his delegate, the ECO and others on matters concerning the environment; – Prevent actions that will harm or may cause harm to the environment, and take steps to prevent pollution and unnecessary degradation onsite; and – Confine construction activities to demarcated areas.

Environmental Officer (EO)	– The EO must be appointed by the Contractor/ Project Manager and is responsible for managing the day-to-day onsite implementation of the EMPr, and for the compilation of weekly environmental monitoring reports. In addition, the EO must act as liaison and advisor on all environmental and related issues, seek advice from the ESCO and ECO when necessary, and ensure that any complaints received from I&APs are duly processed and addressed and that conflicts are resolved in an acceptable manner and timely manner. The EO shall be a full-time dedicated member of the Contractor's team and must be approved by Rietkloof.
	– The following qualifications, qualities and experience are recommended for the individual appointed as the EO:
	  – A relevant environmental diploma or degree in natural sciences, as well as experience in construction site monitoring, excluding health and safety;
	  – A level-headed and firm person with above-average communication and negotiating skills. The ability to handle and address conflict management situations will be an advantage; and
	  – Relevant experience in environmental site management and EMPr compliance monitoring.
	– The EO's responsibilities include:
	  – Monitoring, on a daily basis, environmental specifications on site and compliance with the conditions of the EA, environmental legislation and EMPr;
	  – Keeping a register of compliance / non-compliance with the environmental specifications;
	  – Identifying and assessing previously unforeseen, actual or potential impacts on the environment;
	  – Ensuring that a brief weekly environmental monitoring report is submitted to the ESCO;
	  – Conducting site inspections during the defect's liability period, and bringing any environmental concerns to the attention of the ESCO and Contractor;
	  – Advising the Contractor on the rectification of any pollution, contamination or damage to the construction site, rights of way and adjacent land;
	  – Attending site meetings (scheduled and ad hoc);
	  – Presenting the environmental awareness training course to all staff, Contractors and Sub contractors, and monitoring the environmental awareness training for all new personnel on-site, as undertaken by the Contractor;
	  – Ensuring that a copy of the EA and the latest version of the EMPr are available on site at all times;
	  – Ensuring that the Contractor is made aware of all applicable changes to the EMPr;
	  – Assisting the Contractor in drafting environmental method statements and/or the Environmental Policy where such knowledge/expertise is lacking;
	  – Undertaking daily environmental monitoring to ensure the Contractor's activities do not impact upon the receiving environment. Such monitoring shall include dust, noise and water monitoring; and

RESPONSIBLE PERSON	RESPONSIBILITIES
	– Maintaining the following on site: ▪ A weekly site diary. ▪ A non-conformance register (NCR). ▪ An I&AP communications register, and ▪ A register of audits. – The EO will remain employed until all rehabilitation measures, as required for implementation due to construction damage, are completed and the site is handed over to the Holder of the EA.
Environmental Onsite Compliance Officer (ESCO)	– A suitably qualified ESCO must be appointed by the Holder of the EA to monitor the project compliance onsite on a full time basis. – Responsibilities of the ESCO include: – Be fully conversant with the BAR, the conditions of EA and the EMPr; – Be fully conversant with all relevant environmental legislation and ensure compliance thereof; – Approve method statements (co-approval with Site Manager); – Remain employed until the completion of the construction activities; and – Report to the Project Manager, including all findings identified onsite. – In addition, the ESCO will: – Undertake monthly inspections of the site and surrounding areas to audit compliance with the EMPr and conditions of the environmental authorisation; – Take appropriate action if the specifications contained in the EMPr and conditions of the environmental authorisation are not followed; – Monitor and verify that environmental impacts are kept to a minimum, as far as possible; and – Ensure that activities onsite comply with all relevant environmental legislation.
ECO	– A suitably qualified external ECO must be appointed by the Holder of the EA to audit the project compliance in terms of the EMPr and conditions of the EA on a monthly basis, during the construction phase, in line with Condition 21 of the EA. – The costs of the ECO shall be borne by the Holder of the EA (proof of appointment must be maintained onsite).
Contractors, Staff and Service Providers	– Complying with the Holder of the EA's environmental management specifications; – Be conversant with all EMPr and conditions of the EA, and ensure compliance thereto; and – Adhering to any environmental instructions issued by the Site Manager/Project Manager on the advice of the ECO.

7.2 ENVIRONMENTAL AWARENESS PLAN

Legislation (NEMA) requires that Rietkloof develop an environmental awareness plan that describes the manner in which they intend to inform employees of any environmental risks which may result from their work and the manner in which the risks must be dealt with in order to avoid pollution or the degradation of the environment. In recognition of the need to protect our environment, environmental management should not only be a legal obligation but also as a moral obligation.

It is important to ensure that all relevant personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and ongoing minimisation of environmental degradation and harm.

To achieve effective environmental management, it is important that employees, contractors (including subcontractors) are aware of the responsibilities in terms of the relevant environmental legislation and the contents of the EMPr, conditions of the EA.

Rietkloof will provide appropriate resources to facilitate social and environmental awareness training during the construction, operational and decommissioning phases of the project. Rietkloof will require that all managers associated with the project adhere to the mitigation/management measures detailed in the EMPr and identify, evaluate, and minimise risks to the social, physical and biophysical environments. This will be implemented by educating employees in social and environmental matters and responsibilities relating to performance of their assigned tasks. Furthermore, employees will be entrusted to maintain the necessary level of environmental performance for their activities. Contractors, and their associated sub-contractors, will also need to demonstrate compliance to mitigation/ management measures included in the EMPr.

The following methodology described below in **Sections 7.2.1** will be used to implement and ensure environmental and social awareness and competence:

7.2.1 *INTERNAL COMMUNICATION*

Internal communication of environmental and social issues to ensure environmental awareness will be achieved by using any combination of the following means:

- Meetings;
- Memos;
- Notice boards;
- Briefs;
- Reports;
- Monthly themes;
- Daily operational bulletins;
- Newsletters;
- E-mail;
- Telephone; and
- Induction training.

STANDARD MEETINGS

The following standard meetings will be held at specific times to ensure that environmental and social awareness; potential problems; complaints etc. are heard and addressed proactively:

- Safety, Health and Environmental Meetings will be held monthly by the Senior Management;
- Safety, Health and Environmental Meetings will be held weekly (during construction) and monthly (during operation) by the relevant personnel, environmental and social issues will form part of the agenda; and
- Communication between all personnel and Senior Management will be facilitated through the appropriate reporting lines, or by using complaint and incident forms.

ENVIRONMENTAL AND SOCIAL TALK TOPICS

Monthly environmental and social talk topics will be compiled and distributed to relevant personnel and will be displayed on appropriate notice boards. As a minimum, the following topics must be covered:

- Water Quality;
- Water Use and Consumption;
- Air Quality i.e. dust;
- Power Consumption and Energy Efficiency;
- Waste Management;

- Fauna and Flora;
- Emergency Procedures;
- Incidents Reporting;
- Systems;
- Noise;
- Heritage Impacts;
- Landowner Etiquette; Speed Limits;
- Health Risks (such as HIV/ Aids); and
- General Awareness (e.g. World Environment Day, National Arbour Day).

GENERAL COMMUNICATIONS

Communication to the community, government, landowners, neighbouring farmers, environmental groups, non-government organisations and other stakeholders will be communicated to ensure environmental and social awareness by means of the following, as undertaken during this BA process:

- Fax or E-mail;
- Telephone;
- Formal meetings; and
- Open days.

TRAINING

It is important to ensure that all personnel, contractors and their sub-contractors have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimisation of environmental harm. As a minimum environmental training must include the following:

- Employees must have a basic understanding of the key environmental features of the site and the surrounding environment;
- Employees will be thoroughly familiar with the requirements of the EMPr and the environmental specifications as they apply to the project;
- Employees must undergo training for the operation and maintenance activities associated with project and have a basic knowledge of the potential environmental impacts that could occur and how they can be minimised and mitigated;
- Awareness of any other environmental matters, which are deemed to be necessary by the Environmental Officer; and
- Training must include the environment, health and safety as well as basic HIV/AIDS education.

The following facets of the training form part of this Environmental and Social Awareness Plan:

- **Induction**: Environmental and social awareness training will be given at induction when personnel join the company and/or return from leave. Induction training will also be given to visitors entering the site. induction training will include, *inter alia*:
    - A discussion on the environmental concept, what does it comprise of and how do we interact with it;
    - A description on the components and phase of the specific renewable power generation facility;
    - A general account of how the facility and its associated activities can affect the environment giving rise to what are called environmental impacts; and
    - A discussion on what staff can do in order to help prevent the negative environmental impacts from degrading the environment i.e. environmental impact management.
- **Job Specific Training**: Job specific training programmes will be developed as and when required. The programs will be based on the significant environmental and social aspects/ impacts that are identified during

regular audits and site inspections. Supervisory staff will be equipped with the necessary knowledge and information to guide their employees on environmental and social aspects applicable to performing a specific task.

- **Competency Training**: The Environmental Officer will be responsible for the environmental and social competency and awareness training of Middle Management and supervisors. This training will be performed both on a one-on-one basis and through workshops and presentations. Competence and the effectiveness of training and development initiatives will be determined through the following methods:
  - Trend analysis of incidents reported; and
  - Analysis of work areas during visits and audits.
- The process to declare competency of personnel is documented in the ISO9001:2000 procedure. This plan will be amended periodically considering operational changes, learning experienced during its implementation and other activities that can affect the risk profiles.
- **Training Records**: Training can be done either in a written or verbal format but will be in an appropriate format for the receiving audience. Persons having received training must indicate in writing that they have indeed attended a training session and have been notified in detail of the contents and requirements of the EMPr. The attendance registers must be kept on file.

7.3 MONITORING

The internal ESCO will monitor the day-to-day site activities on an ongoing basis and will produce weekly monitoring reports. The external ECO will undertake monthly audits to ensure compliance with the EMPr and conditions of the environmental authorisation during the construction activities and will report to the Site Manager should any non-compliance be identified, or corrective action deemed necessary.

During the operational phase, the Holder of the EA will establish, implement and maintain a procedure to monitor and measure, on a regular basis, the key characteristics of the operations that may have a significant environmental impact. The procedure shall include the documenting of information to monitor performance, applicable operational controls and conformity with the operation's environmental objectives and targets.

The Holder of the EA will ensure that all instruments and devices used for the measurement or monitoring are calibrated and appropriately operated and maintained. Calibration records must be kept on site or in close proximity to the equipment for ease of availability.

All the conditions outlined in the EMPr (**Section 8**) will be subject to the required internal day-to-day monitoring and external compliance monitoring. Where required, any specific additional monitoring has been outlined in the EMPr.

7.4 NON-CONFORMANCE AND CORRECTIVE ACTON

The auditing of the construction and operational activities may identify non-conformances to the EMPr and conditions of the environmental authorisation. Non-conformances may also be identified through incidents, emergencies or complaints recorded. In order to correct non-conformances, the source must be determined and corrective actions must be identified and implemented.

COMPLIANCE WITH THE EMPR AND CONDITIONS OF THE ENVIRONMENTAL AUTHORISATION

- A copy of the EMPr, the BAR including all specialist reports and conditions of the EA will be available onsite at all times for the duration of the construction and operational activities;
- All persons employed by a contractor or their sub-contractors will abide by the requirements of the EMPr and conditions of the environmental authorisation;
- Any members of the workforce found to be in breach of any of the specifications contained within the EMPr and conditions of the environmental authorisation may be ordered by the Site Manager to leave the site. A contractor will not direct a person to undertake any activity which would place them in contravention of the specifications contained within the EMPr and conditions of the environmental authorisation;

- Should a contractor be in breach of any of the specifications contained in the EMPr and conditions of the environmental authorisation, the EO and/ or Site Manager can verbally or in writing inform them of the breach to enable the contractor to rectify immediately. Should the breach persist, the Site Manager will, in writing, instruct the contractor responsible for the incident of non-compliance regarding corrective and/or remedial action required, specify a timeframe for implementation of these actions, implement a penalty and/or indicate that work will be suspended should non-compliance continue;
- Should non-compliance continue, further written notification will be forwarded to the contractor responsible for the incident of non-compliance outlining the required corrective and/or remedial action, the timeframe for implementation, penalties and/or work will be suspended as specified previously; and
- Departmental officials will be given access to the property referred to in the EA for the purpose of assessing and/or monitoring compliance with the EMPr and conditions of the environmental authorisation, at all reasonable times.

7.4.1 *SPOT FINES*

The ESCO and ECO shall be authorised to impose spot fines for any of the transgressions detailed below:

- Littering on site;
- Lighting of illegal fires on site;
- Any persons, vehicles or equipment related to the contractor's operations found within the designated 'no-go' areas (especially for significant cultural resources such as nearby graves etc.);
- Creating excessive dust or excess noise emanating from site;
- Possession or use of intoxicating substances or weapons on site;
- Trapping, hunting or trading of fauna and / or plants on site;
- Any vehicles being driven in excess of designated speed limits;
- Any farm gates being left open;
- Unauthorised removal and/or damage to fauna, flora or cultural or heritage objects on site; and
- Urination and defecation anywhere other than using the toilet facilities that have been provided.

These activities, along with the appropriate guidelines to determining the fines, shall be agreed to by the Holder of the EA, the Site Manager and the Contractor. Such fines will be issued in addition to any remedial costs incurred as a result of non-compliance with the environmental specifications and or legal obligations. Rietkloof will inform the contractor of the contravention and the amount of the fine.

It is important to note that fines can be issued on an organisational level, as well as at an individual level. These fines will be paid to an organisation as discussed and agreed to by the Holder of the EA, Site Manager, Contractors and ECO. Proof of payment is to be provided to the EO within 30 days of the fine being issued. Payment of a fine may not be subtracted from any moneys owed to the contractor by the client. A fine is not deemed a cost saver to the client but a measure to ensure that all construction activities are undertaken in a manner that reduces further environmental damage.

7.4.2 *PENALTY FINES*

Where environmental damage is caused or a pollution incident, and/or failure to comply with any of the environmental specifications contained in the EMPr, the Contractor shall be liable to pay a penalty fine. The following transgressions should be penalised:

- Hazardous chemical/oil spill;
- Damage to sensitive environments;
- Damage to cultural and historical sites;
- Unauthorised removal/damage to indigenous trees and other vegetation, particularly in identified sensitive areas;
- Uncontrolled/unmanaged erosion;

- Unauthorised blasting activities; and
- Violation of environmental authorisation conditions.

These activities, along with the appropriate guidelines to determining fines, shall be agreed to by the Holder of the EA, the Site Manager and Contractor. The fines will be calculated on a severity basis and imposed as per the merits of the case. In addition to penalties, the Site Manager has the power to remove from site any person who is in contravention of the EMPr, and if necessary, the engineer can suspend part of or all the works, as required.

7.4.3 *DUTY OF CARE*

All personnel involved with the construction and operational activities onsite will be responsible for implementing measures to prevent pollution or degradation of the environment from occurring, continuing or recurring. Insofar as such harm to the environment is authorised by law, or cannot reasonably be avoided or stopped, personnel shall minimise and rectify such pollution or degradation of the environment.

7.5 DOCUMENTATION AND REPORTING

The following documentation must be kept onsite to record compliance with the EMPr and conditions of the environmental authorisation:

- Record of complaints; and
- Record of emergencies and incidents.

The contractor will be required to report on the following:

- Environmental incidents involving contractor/ employees and/or the public;
- Environmental complaints and correspondence received from the public; and
- Incidents that cause harm or may cause harm to the environment.

The above records will form an integral part of the ECO's reports and records thereof maintained for the duration of the project. These records will be kept with the EMPr and conditions of the environmental authorisation and will be made available for scrutiny if so requested by the Site Manager or his delegate and the ESCO.

The contractor will ensure that the following information is recorded for all environmental complaints/incidents/emergencies:

- Date of complaint/incident/emergency;
- Location of complaint/incident/emergency;
- Nature of complaint/incident/emergency;
- Causes of complaint/incident/emergency;
- Party/parties responsible for causing complaint/incident/emergency;
- Immediate actions undertaken to stop/reduce/contain the causes of the complaint/incident/emergency;
- Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint/incident/emergency;
- Timeframes and the parties responsible for the implementation of the corrective or remedial actions;
- Procedures to be undertaken and/or penalties to be applied if corrective or remedial actions are not implemented; and
- Copies of all correspondence received regarding complaints/incidents/emergency.

7.6 METHOD STATEMENTS

Before the contractor begins each construction activity, the contractor shall give to the ESCO and Site Manager a written Method Statement setting out the following:

- The type of construction activity;
- Locality where the activity will take place;
- Identification of impacts that might result from the activity;
- Identification of activities or aspects that may cause an impact;
- Methodology and/or specifications for impact prevention for each activity or aspect;
- Methodology and/or specifications for impact containment for each activity or aspect;
- Emergency/disaster incident and reaction procedures; and
- Treatment and continued maintenance of impacted environment.

The contractor must provide such information at least two weeks in advance of any or all construction activities for review and approval. Any changes made to the Method Statement after approval shall be given to the ESCO for review and the Site Manager for approval.

The ESCO and/or Site Manager may provide comment on the methodology and procedures proposed by the contractor but shall not be responsible for the contractor's chosen measures of impact mitigation and emergency/disaster management systems.

7.7 PUBLIC COMPLAINTS

A signboard must be erected at the entrance to the project site, informing the public of the construction activities taking place. The signboard must include the following information:

- The name of the contractor; and
- The name and contact details of the site representative to be contacted in the event of emergencies or the location of the complaint registration.

A generic grievance mechanism is detailed in **Section** Error! Reference source not found..

8 ENVIRONMENTAL MANAGEMENT PROGRAMME

The EMPr contains guidelines, operating procedures, rehabilitation and pollution control requirements which will be binding to the onsite personnel working for, or on behalf of the Holder of the EA. It is essential that the EMPr be carefully studied, understood, implemented and adhered to at all times.

In instances where the method statements provided by the contractor conflict with the EMPr, such conflicts will be discussed between the Site Manager, ESCO and where necessary the ECO and contractor and if unresolved the EMPr will take precedent.

To simplify the EMPr requirements, each column related to the EMPr tables has been described in **Table 8-1**. The EMPr identifies various actions which are undertaken throughout the construction and operational phases. Not every action will be required during the entire course of activities. Therefore, the actions identified in the EMPr have been given priority timeframes for proposed implementation.

Table 8-1: Structure of the EMPr

COLUMN	DESCRIPTION
Reference Number	The reference numbers link the mitigation measures to the impacts identified by the specialists in the Basic Assessment Report. Generic Mitigation measures are allocated an "EMP" number.
Activity / Impact	Highlights the various activities/aspects associated with the project i.e. the contractors' activities that will interact with the environment. Each impact / activity is cross referenced to the impacts identified in the EIA report.
Mitigation and Management Measures	Indicates the actions required to prevent and/or minimise the potential impacts on the environment that are associated with the project
Responsibility	Indicates the party responsible for implementing the environmental measures and action plans laid out in the EMPr. Please note that the site manager will have authority to stop works if/as necessary
Development Phase	Indicates during which phase of development the actions for the specific aspect must be implemented and/or monitored
Additional Monitoring Requirements	Indicates the method and frequency of any additional monitoring requirements over and above the day-to-day monitoring undertaken by the ESCO and the monthly compliance auditing undertaken by the ECO.

The following assumptions have been made in the development of the environmental specification in this EMPr:

- An environmental file containing the information/documentation required by this EMPr is to remain onsite and to be made available at the request of the auditor or similar monitoring body; and
- For ease of reference, any person(s) employed to assist in the project i.e. contractors, sub-contractor and permanent and temporary staff, will be collectively referred to as 'onsite personnel'.

8.1 CONTRACTOR LAYDOWN AREA AND SITE ACCESS

8.1.1 *OBJECTIVES*

To implement measures to minimise impacts on the environment from the initiation of construction activities through planning, careful site access route selection and implementation of mitigation measures.

8.1.2 *INDICATOR AND COMPLIANCE MECHANISMS / OUTCOMES*

The following indicator and compliance mechanisms are applicable:

- Health, safety, environmental and community incident and complaints management system register;
- Close-out on incidents;
- Monitoring and audit reports;
- Inductions training and register; and
- Environmental awareness programme/toolbox talks.

8.1.3 *MITIGATION MEASURES*

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
EMP1	Project Initiation of Construction Activities	Construction activities to remain within demarcated project footprint.	ESCO / ECO Contractor Project Manager	Detailed design phase Construction	No additional monitoring required.
EMP2		Site clearing and topsoil removal must be limited to the footprint of the infrastructure requirements. All vegetation clearing must be done in a phased manner.			
EMP3		Clearly mark health and/or safety hazards onsite.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
EMP4		Locate firefighting measures onsite, such as fire extinguishers, and make personnel aware of fire prevention and firefighting measures.			
EMP5		Firefighting equipment must be securely placed and inspected monthly.			
EMP6		Wetland Pan adjacent to western camp site to be demarcated and fenced as no go area.			
EMP7		The southern access road passes through area having a high diversity in comparison to surrounding area of influence with several species present that are not recorded elsewhere. Care to be taken with access road alignment to minimise loss and species search and rescue is required.			
EMP8		Where there are further changes/updates to the vertical and horizontal alignments of the road network and site laydown area, such sections/areas must be reassessed in order to determine any further risks and impacts to the ecology and/or species.			
EMP9		Road borders should be regularly maintained to ensure that vegetation remains short and that they therefore serve as an effective firebreak.			
EMP10		The road near the access point be kept clear of tall vegetation to allow for good sight lines.			
EMP11		All access and internal roads should be investigated for their topographical suitability, i.e., feasibility for haulage trucks and especially abnormal loads to navigate and have sufficient height clearance for any Eskom lines, Telkom lines or similar.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
EMP12		The chosen access and circulation roads will have to be upgraded to suit abnormal load vehicle requirements. It needs to be ensured that if the access and circulation roads to the site are to remain as gravel roads, the routes need to be maintained during the additional loading experienced during the construction phase and be reinstated once construction is complete.			

8.2 VEHICLE, EQUIPMENT AND MACHINERY MANAGEMENT

8.2.1 *OBJECTIVES*

To implement measures to minimise the impacts on the environment from poorly maintained equipment, machinery and vehicles onsite.

8.2.2 *INDICATOR AND COMPLIANCE MECHANISM / OUTCOMES*

The following indicator and compliance mechanisms are applicable:

- Health, safety, environmental and community incident and complaints management system register;
- Close-out on incidents;
- Monitoring and audit reports;
- Transport route delineation;
- Daily equipment, machinery and vehicle checklists; and
- Incident classification and reporting procedure.

8.2.3 *MITIGATION MEASURES*

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
EMP13	Vehicle and Equipment Maintenance	Undertake all significant vehicle maintenance work off-site at a registered workshop. Evidence of such maintenance must be recorded and maintained onsite for verification.	EO ESCO / ECO Contractor	Construction Operation De-commissioning	No additional monitoring required.
EMP14		Minor maintenance can be undertaken onsite within a designated area on a hard standing.			
EMP15		Drip trays must be utilised under all stationary vehicles and equipment.			
EMP16	Operation of Equipment, Machinery and Vehicles	Adequately maintain equipment, machinery and vehicles to reduce the potential for spillages of oil, diesel, fuel or hydraulic fluid, as well as to ensure road-worthiness. Evidence of such maintenance must be recorded and maintained onsite for verification.			
EMP17		During transportation of materials, large loads must be secured before entering the local road network.			
EMP18		Increase visibility of heavy vehicles by utilising sufficient reflectors and activating headlights during operation.			
EMP19		The contractor must order the contractor must inspect all vehicles, machinery and equipment every morning for defects (indicator lights, oil leaks, etc.) and excessive emissions. Equipment not operating optimally must be repaired or withdrawn from operation. Inspection checklists to be maintained onsite for verification. Vehicle repairs to be undertaken in designated areas.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
EMP20		Identify and use transport routes that will least impact local road users and traffic i.e. routes which minimise right turns across traffic. Identified routes must be documented and made available for inspection on request.			
EMP21		Avoid heavy vehicle use on the local road network during peak hours i.e. 07h00 – 08h00 and 16h00 – 17h00.			
EMP22		Undertake fuel and chemical management for storage, handling and spillages in accordance with the Fuel and Chemical Management section.			
EMP23		The access road passes through and along a well-defined watercourse with large *Brunsvigia josephinae* population (19) present within the riparian vegetation and directly adjacent to the watercourse. The access road should be aligned as far from watercourse as possible to reduce requirement for relocation of protected species.			
EMP24		Wetland pan near western site camp to be fenced to avoid not being used for vehicle turning.			
EMP25		All vehicles must be regularly inspected for leaks. Re-fuelling must take place on a sealed surface area to prevent ingress of hydrocarbons into the topsoil.			
EMP26		In the event of a vehicle breakdown, maintenance of vehicles must take place with care and the recollection of spillage should be practiced near the surface area to prevent ingress of hydrocarbons into topsoil and subsequent habitat loss			

8.3 FUEL AND CHEMICAL MANAGEMENT

8.3.1 *OBJECTIVES*

To ensure the correct storage and handling of fuels and chemicals in order to prevent impacts surrounding environment.

8.3.2 *INDICATOR AND COMPLIANCE MECHANISMS / OUTCOMES*

The following indicator and compliance mechanisms are applicable:

- Maintenance records;
- Safe Disposal certificates (if applicable);
- Material safety data sheets;
- Health, safety, environmental and community incident and complaints management system register;
- Chemicals management procedure (to be developed);
- Waste management procedure (to be developed);
- Monitoring and audit reports; and
- Training records.

8.3.3 *MITIGATION AND MANAGEMENT*

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
EMP27	Fuel and Chemical Management	Develop and implement a site specific procedure for the storage and handling of chemical substances and hazardous goods as well as an Incident Classification and Reporting procedure	ESCO / ECO Contractor	Construction Operation	No additional monitoring required.
EMP28		Develop and implement a site specific Spill Management Procedure.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
EMP28		A layout plan must be developed and placed onsite, indicate the location of the fuel and chemical storage areas.			
EMP29		Securely fence and lock the storage areas to accommodate all hazardous substances such as fuel, oils and chemicals. The storage area must be covered, and the floor must be an impermeable surface and suitably bunded as per the requirements outlined in SANS 10089-1 (2008).			
EMP30		Develop and implement a procedure for the management of all hydrocarbon spillages			
EMP31		Maintain oil traps or interceptors on a regular basis and maintain records.			
EMP32		All chemical substances and hazardous goods (including hydrocarbons) stored onsite must be clearly and the Safety data sheets (SDS) for all onsite chemicals, hydrocarbon materials and hazardous substances must be readily available. At a minimum the SDSs must include mitigation measures to ameliorate potential environmental impacts which may result from a spill, incorporating health and safety mitigation measures			
EMP33		Keep fuels, oils or other chemicals used outside of the bunded area to a minimum and use suitable secondary containment in the form of drip trays.			
EMP34		A spill kit must be kept onsite and an adequate number of staff must be trained on how to use it in accordance with the Spill Management Procedure.			
EMP35	Health and Safety	Display “no smoking” and “no naked flame” signs in and around the project area, as well as near the hazardous material store.	EO	Construction	

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
EMP36		Strategically place the correct types of fire extinguishers onsite and near the hazardous material store. Train key personnel on basic firefighting skills.	ESCO / ECO Contractor	Operation De-commissioning	
EMP37		Frequently inspect and maintain containment facilities and retain records onsite.			

8.4 WASTE MANAGEMENT

8.4.1 *OBJECTIVES*

To ensure the correct storage and handling of fuels and chemicals in order to prevent impacts to the surrounding environment.

8.4.2 *INDICATOR AND COMPLIANCE MECHANISMS/ OUTCOMES*

The following indicator and compliance mechanisms are applicable:

- Induction training and records;
- Material safety data sheets;
- Waste Management Procedure (to be developed);
- Relevant SANS Codes of Practice;
- Safety disposal certificates and waste manifests (all waste streams);
- Emergency preparedness and response procedure (to be developed);
- Incident classification and reporting management procedure (to be developed);
- Waste manifest documentation;
- Health, safety, environmental and community incident and complaints management system register; and

– Monitoring and audit reports.

8.4.3 *MITIGATION AND MANAGEMENT MEASURES*

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
EMP39	Administrative	A site specific Waste Management Procedure detailing waste storage, handling and disposal of both general and hazardous waste must be drafted and implemented onsite. The waste management procedure must be included in the final EMPr for submission to the authorities for approval prior to the commencement of construction activities.	EO ESCO / ECO Contractor	Construction Operation De-commissioning	No additional monitoring required.
EMP40	General Waste Management	General waste generated as a result of construction and operational activities must be managed in accordance with the Waste Management Plan.			
EMP41		Train and inform all onsite personnel regarding general waste minimisation, management and disposal as per the Waste Management Procedure.			
EMP42		Littering and burning of waste onsite is prohibited.			
EMP43		Place an adequate number of general waste bins around the site during construction and operational activities to minimise littering. The bins must be suitably labelled “General Waste” to prevent mixing of waste. The bins must be removed from the site on a regular basis for disposal at a registered or licensed disposal facility.			
EMP44		Maintain a neat construction site by removing litter, rubble and waste materials regularly.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
EMP45		Retain records of appropriate safety disposal certificates associated with general waste removal, transportation and disposal.			
EMP46		Hazardous waste (including cement bags) are to be placed in designated labelled hazardous waste bins. The mixing of hazardous waste with general waste is prohibited. Any general waste which has been or potentially been mixed with any hazardous waste must be considered hazardous waste and disposed of accordingly.			
EMP47		The principles of recover, recycle and reuse of general waste must be implemented onsite as far as possible.			
EMP48	Hazardous Waste Management	Hazardous waste (including cement bags) generated as a result of construction, operational and de-commissioning activities should be managed in accordance with the Waste Management Procedure.	EO ESCO / ECO Contractor	Construction Operation De-commissioning	No additional monitoring required.
EMP49		Train and inform all onsite personnel regarding hazardous waste minimisation, management and disposal as per the Waste Management Procedure			
EMP50		A designated appropriately demarcated and covered hazardous waste storage area must be established on a hard-standing area.			
EMP51		Ensure that all hazardous wastes temporarily stored on site are stored in a covered skip and are placed on a hard standing.			
EMP52		In the event of a spill resulting from the storage and handling of hazardous waste streams, affected areas are to be cleaned up immediately and disposed of within the hazardous waste bin. Key personnel must be trained on handling spillages.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
EMP53		Retain records of appropriate safety disposal certificates associated with hazardous waste removal, transportation and disposal.			
EMP54		Ensure cognisance of the following SANS codes of practice: – SANS 10234: Classification and Labelling of Chemicals – SANS 10228: The Identification and Classification of Dangerous Substances – SANS 10229: Packing of Dangerous Goods for Road and Rail Transportation.			
EMP55		Manage all liquid hazardous waste spillages as per the Waste Management Procedure and the Spill Procedure.			
EMP56		An emergency preparedness and response plan is to be developed by the contractor/operator for any hazardous waste being removed, transported and disposed of offsite.			
EMP57		Ensure that waste manifest documentation (as per the Waste Classification and Management Regulations, GNR.634 of 2013 is prepared and maintained for the generation, transportation and disposal of hazardous waste.			

8.5 SOIL AND LAND MANAGEMENT

8.5.1 *OBJECTIVES*

To prevent any disturbance, erosion or contamination of soil resources.

8.5.2 *INDICATOR AND COMPLIANCE MECHANISMS/ OUTCOMES*

- The following indicator and compliance mechanisms are applicable: Induction training and records;
- Waste Management Procedure (to be developed);
- Incident Classification and Reporting Management Procedure (to be developed);
- Health, safety, environmental and community incident and complaints management system register;
- Monitoring and audit reports; and
- Stormwater Management Plan.

8.5.3 *MITIGATION AND MANAGEMENT*

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
ASLC 1	During the planning and design phase inappropriate stormwater design may lead to an increase in surface soil erosion.	Appropriate stormwater structures must be designed and implemented for all new infrastructure (e.g. roads, turbine bases etc.).	ESCO / ECO Contractor	Planning and Design	No additional monitoring
		As far as practically possible, all construction activities should occur in the low flow season, during the drier summer months.			
		Minimize earthworks and fills.			
		All roads situated on slopes must incorporate stormwater diversions.			
		Sheet runoff from access roads should be slowed down by the strategic placement of berms			
ASLC2	The increase in renewable energy	Avoid developing on high potential agricultural land (like irrigated areas, croplands, etc.).	EO	Planning and design	

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
ASLC 9 **ALC 13**	development in the local area will result in a gradual reduction of available agricultural land over time.	Construction activities must only occur within the demarcated construction footprint.	ESCO / ECO Contractor	Construction Operational	
		If unavoidable, ensure that all development footprints on agricultural land are kept at a minimum.			
		Fencing of WEF infrastructure should be limited as far as possible to allow for maximum grazing and movement of livestock and game within the site.			
ASLC3 **ALSC 11**	The development of access roads could result in the loss of irrigated agricultural crop land.	Where possible, the development of access roads (and other infrastructure) must avoid impacting existing croplands.	EO ESCO / ECO Contractor	Planning and Design Phase	
		If not possible, the loss of cropland must be offset by preparing a new cropland in close vicinity to the lost area.			
		If cropland is destroyed by the wind farm infrastructure, the offset areas must be the same size as lost areas. Offset areas must be located in areas where both the landowner/occupier and the developer has agreed on prior to commencement of construction			
ASLC 4	Loss of Soil types as a result of construction activities	Infrastructure must be planned in such a way as to minimise the loss of soil.	EO ESCO / ECO Contractor	Construction	
		As much vegetation growth as possible (of indigenous floral species) should be encouraged to protect soil.			
		All soil compacted as a result of construction activities as well as ongoing operational activities falling outside of project footprint areas should be ripped and profiled			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
ASLC5	Hazardous chemical spills and leakages could lead to soil contamination and a loss of fertile soils if not managed appropriately.	Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of hazardous chemicals to the environment and stored in adequate containers until appropriate disposal at a licenced landfill site.	EO ESCO / ECO Contractor	Construction Decommissioning	
ASLC 6	Fires originating from the construction site could lead to the loss of grazing and game.	Ensure that all personnel are aware of the fire risk and the need to extinguish cigarettes before disposal, in appropriate waste disposal containers.	EO ESCO / ECO Contractor	Construction, Decommissioning	
		Smoking will only be allowed in demarcated areas with easy access to firefighting equipment.			
		Welding and other construction activities requiring open flames shall be done in a designated area containing firefighting equipment.			
		The risk of fire is highest in the late summer and autumn months, during high wind velocities and dry periods. To avoid and manage fire risk the following steps should be implemented: – Have on site fire-fighting equipment (such as fire extinguishers and beaters) and ensure that all personnel are educated how to use it and procedures to be followed in the event of a fire. – Identify the relevant authorities and structures responsible for fighting fires in the area and shall liaise with them regarding procedures should a fire commence. – Ensure that all the necessary telephone numbers (including local Farmers Association Fire Marshall) to use in a case of an emergency are displayed at conspicuous and relevant locations.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
		– No open fires shall be allowed on site for the purpose of cooking or warmth. Cooking fires must only be lit in designated cooking areas.			
		All reasonable steps must be undertaken to prevent the accidental occurrence or spread of fire.			
		Site personnel must be made aware of the procedure to be followed in the event of a fire. The appointed fire officer shall notify the Fire and Emergency Services in the event of a fire and shall not delay doing so until such time as the fire is beyond his / her control.			
		Any work that requires the use of fire may only take place within designated areas. Fire-fighting equipment shall be available in these areas (including fire extinguishers and beaters).			
ASLC 7	The incorrect stockpiling of the soil horizons (specifically topsoil) could potentially result in a decrease of agricultural viability/potential.	Develop and implement a Rehabilitation and Monitoring Plan to monitor rehabilitated areas.	EO ESCO / ECO Contractor	Construction	
		Ensure that topsoil does not get buried by subsoil during stockpiling. Failure to comply may result in topsoil sterilisation.			
		Implement measures such as wind-breaks, swales and watering as required aiding the initial grown of primary vegetation.			
		Fertile topsoil must not be stockpiled for periods exceeding 12 months or exceeding 2m in height to avoid topsoil sterilization.			
		Topsoil may be supplemented with an indigenous seed mix.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
ASLC 8	Excavations for the construction of the turbines and associated infrastructure will disturb the soil profile. If topsoil becomes buried, or subsoil rock, that is less suitable for root growth, remains at the surface, the agricultural suitability of the soil, that will become available for agriculture again after decommissioning of the WEF, will be reduced.	The upper 15-20 cm of top soil must be stripped and stockpiled as topsoil where possible. It should be retained for re-spreading over disturbed surfaces during rehabilitation.	ESCO / ECO Contractor	Construction, Decommissioning	
		All other soil excavated will be stockpiled separately from topsoil as subsoil.			
		Backfilling of excavations must be undertaken using subsoil first and then top soil (ensure that topsoil does not get buried by subsoil).			
		An ESCO / ECO must monitor depth and cover of topsoil spreading during rehabilitation to ensure a 20cm depth in valleys. Rocky areas do not require topsoil but must be monitored by the ESCO / ECO during rehabilitation.			
		Topsoil allocated for rehabilitation must not be mixed with other materials, such as building rubble, rock, subsoil, etc.			
		Topsoil stockpiles are to be handled only twice – once during clearing and stockpiling and once during rehabilitation/backfilling unless input is required as advised by the ESCO / ECO.			
ASLC 10 **ASLC 12**	The increase in impacted areas and hard surfaces will increase run-off and	All run-off water from hard surface areas (e.g. roads, hardstands etc.) and construction impacted areas must be collected, channelled and disposed of in an appropriate manner.	EO ESCO / ECO Contractor	Construction Operation Decommissioning	
		Anti-erosion features must be installed where required.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
	potentially lead to soil erosion	Ensure that all cleared and impacted land is rehabilitated and re-vegetated.			
		Implement Erosion Management Plan outlined in Section 9.6.			
ASLC 15	During the decommissioning phase the decrease in renewable energy development in the local area will result in an increase of available agricultural land.	All impacted agricultural land should be rehabilitated for future agricultural use.	Contractor	Decommissioning	
EMP46	Stockpile Management	Adequately maintain stockpiled material to prevent this becoming the source of air pollution (windblown dust).	EO ESCO / ECO Contractor	Construction	
		Position storage/stockpile areas in unobtrusive positions in the landscape, where possible.			
EMP47		Level and shape the area designated for the deposition of stockpiled material to ensure the efficient drainage of the site. No general or hazardous waste may be disposed of at this site.			
EMP48	Soil and Land Management	Soils excavated during construction of the facility must be appropriately stored in stockpiles which are protected so as to limit the loss of soils.	EO ESCO / ECO	Planning and Design Construction	

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
EMP52		Due to the potential for soil compaction due to vehicles, traffic must be limited to existing or proposed roadways as far as possible.	Contractor		
EMP49		The construction of roads must be limited in width and length as far as is practical to limit impacts.			
EMP50		Where soil compaction outside of the designated development areas occurs, this needs to be rehabilitated to the pre-development soil permeability to maintain infiltration.			
EMP51		Vegetation removal must be kept to a minimum and limited to the area of development.			
EMP52		Where an impact to the vegetation outside of the development footprint occurs, rehabilitation measures must be undertaken to maintain the baseline vegetation population and health.			
EMP53		Once the operations have concluded, the stockpiled soils must be returned to the impacted land to reinstate the land capability, with topsoil being returned as the top layer. If necessary, soil amelioration in the form of fertilisers may be required to return the fertility to baseline conditions. To limit erosion, it must be ensured that the soils are rehabilitated to their pre-development characteristics as far as is practicable to ensure infiltration and vegetation rooting.	EO ESCO / ECO Contractor	Construction Operation Decommissioning	
EMP54		The ESCO / ECO or a suitably qualified ecologist must be appointed to monitor the rehabilitation and to ensure that the vegetation health is returned to the baseline health where practically feasible.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
EMP55		Erosion observed (both on-) must be rehabilitated, with mitigation measures adopted in high risk areas (i.e. gabions, gabion mattresses).			
EMP56		Parking areas for staff vehicles must ideally be placed on hardstanding (e.g. asphalt) to limit the impacts of oil leaks to the soil environment.			
EMP57		Sufficient on-site ablutions must be made available during site construction and decommissioning.			
EMP58		Weed and invader species growth needs to be appropriately monitored and managed, both during the site construction, operation and after decommissioning.			
EMP59		The decommissioning and rehabilitation measures must be phased to limit areas of exposed soil. Vegetation must be reintroduced during rehabilitation as soon as possible to limit erosion.	EO Project Manager	Decommissioning	

8.6 BIODIVERSITY MANAGEMENT

8.6.1 *OBJECTIVES*

To ensure that impacts to the biodiversity (fauna and flora) of the surrounding environment are ameliorated.

8.6.2 *INDICATOR AND COMPLIANCE MECHANISMS/ OUTCOMES*

The following indicator and compliance mechanisms are applicable:

- Induction training and records;
- Incident Classification and Reporting Management Procedure (to be developed);
- Conservation Management Plan[9];
- A Maintenance Management Pan (to be developed);
- Environmental awareness programme/toolbox talks; and
- Biodiversity monitoring procedure (to be developed).

8.6.3 *MITIGATION AND MANAGEMENT MEASURES*

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
BIO1	Impacts on vegetation and protected plant species	A flora and fauna search and rescue (relocation) must be undertaken before commencement of vegetation clearing. A more comprehensive list of species for which permits will be required is provided in Appendix 1: Plant Species of Conservation Concern (Red listed) and Appendix 2: Flora Protected in Terms of Provincial of the Ordinance(s) of the Ecology & Biodiversity Walkdown Report (**Appendix I**).	Independent Ecologist EO ESCO / ECO Contractor Project Manager	Planning and Design, Construction	Flora and fauna search and rescue
BIO1		Ensure that the final development footprint remains outside of the No-Go areas.			
		Turbines 55 and 68 are positioned adjacent to rocky outcrops; minor layout adjustments for these turbines footprints should be implemented during final surveying and pegging out to avoid outcrops as far as possible.			

[9] It must be noted that the Part 2 Amendment Application recently submitted for the Rietkloof WEF (Ref: 14/12/16/3/3/1/1977/AM1) requests the removal of this requirement from the EA and subsequently the EMPr.

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
		The species *Antimima androsacea* was found to occur at low densities throughout a broader area as indicated; due care to be taken during construction to avoid impact to this species.			
		Preconstruction walk-though of the approved development footprint must be undertaken to ensure that sensitive habitats and species are be avoided where possible.			
		Ensure that lay-down and other temporary infrastructure is within low sensitivity areas, preferably previously transformed areas if possible.			
		Minimise the development footprint as far as possible and rehabilitate disturbed areas that are no longer required by the operational phase of the development.			
		The number and width of access roads must be reduced as far as possible and routes must also be adjusted to avoid areas of high sensitivity as far as possible. This will be informed by the preconstruction walk-through.			
		Preconstruction environmental induction for all construction staff on site to ensure that basic environmental principles are understood and adhered to. This includes awareness and practices as to no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimizing wildlife interactions, remaining within demarcated construction areas etc.			
		Demarcate all areas to be cleared with construction tape or similar material. However, caution must be exercised to avoid using material that might entangle fauna.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
		Disturbance or removal of any protected fauna and flora species is prohibited prior to a permit approval from the relevant authorities.			
BIO4 **BIO5** **BIO6**		Implement the Conservation Management Plan as included in **Section 8.64** of this EMPr[10].	EO ESCO / ECO Contractor Project Manager	Operational	
BIO7	Faunal impacts due to construction activities	During construction any fauna directly threatened by the construction activities must be removed to a safe location by the ESCO / ECO or other suitably qualified person.	EO ESCO / ECO Contractor	Planning and Design Construction Decommissioning	
		Where roads pass right next to major water bodies, provisions must be made for fauna such as toads to pass under the roads by using culverts or similar structures.			
		The illegal collection, hunting or harvesting of any plants or animals at the site is strictly forbidden.			
		Personnel are to remain within the designated construction site and are prohibited from entering the surrounding areas without permission from the EO.			

[10] It must be noted that the Part 2 Amendment Application recently submitted for the Rietkloof WEF (Ref: 14/12/16/3/3/1/1977/AM1) requests the removal of this requirement from the EA and subsequently the EMPr.

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
		No fuelwood collection should be allowed on-site.			
		No dogs or cats or any pets should be allowed on site apart from that of the landowners.			
		Any lighting of the construction areas must be done with low-UV type lights (such as most LEDs), which do not attract insects and must be directed downwards.			
		All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.			
		Access control must be strictly controlled onsite to prevent access of unauthorized persons. Vehicles which need to drive through the site should do so accompanied by the ESCO / ECO or security personnel.			
		Any visitors requiring access to the construction site must be accompanied by the EO or ESCO / ECO, or any designated staff member.			
		All construction vehicles must adhere to a low speed limit (40km/h for cars and 30km/h for trucks) both within the construction site and on the public gravel roads to avoid collisions with susceptible species such as snakes, tortoises, rabbits or hares (any fauna).			
		All personnel should undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
		An Open Space Management plan mustbe developed for the site, which must include management of biodiversity within the affected areas, as well as that in the adjacent rangeland.			
		Minimise impact to potential corridors such as the riparian corridors associated with the larger drainage lines within the facility area			
BIO3 **BIO8**	Increased Soil Erosion risk during construction	Development on steep slopes must be avoided as much as possible.	EO ESCO / ECO Contractor	Planning and design Construction Decommissioning	Regular visual monitoring for erosion problems along the access roads and other cleared areas
		Runoff management / erosion control and dust suppression management should be integrated into the project design			
		Disturbance near to drainage lines must be avoided and sensitive drainage areas near to the construction activities must be demarcated as no-go areas.			
		Regular visual monitoring for erosion problems along the access roads and other cleared areas. Any erosion problems identified must be recorded in the incidents register and must be rectified accordingly.			
		During the wet season, if there are topsoil or other waste heaps present, measures such as sediment traps are to be implemented to prevent erosion and soil movement.			
		A low cover of vegetation must be left wherever possible within the construction footprint to bind the soil, prevent erosion and promote post-disturbance recovery of an indigenous ground cover.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
BIO4	Faunal impacts due to operational activities of the wind farm such as noise, and human presence during maintenance activities	Any potentially dangerous fauna such snakes or fauna threatened by the maintenance and operational or decommissioning activities must be allowed to move off on their own or removed to a safe location by a suitably qualified person.	Project Developer	Operational Decommissioning	A monitoring programme for the Grey Rhebok must be set up on the site at the preconstruction phase and continued into the operational phase for at least 5 years.
		Access control must be strictly controlled onsite to prevent access of unauthorized persons.			
		The illegal collection, hunting or harvesting of any plants or animals at the site is forbidden by anyone expect landowners with the appropriate permits where required.			
		If the site must be lit at night for security purposes, this must be done with downward-directed low-UV type lights, which do not attract insects.			
		All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.			
		If parts of the facility are to be fenced, then no electrified strands must be placed within 30cm off the ground. Alternatively, the electrified strands should be placed on the inside of the fence and not the outside.			
BIO5	All areas disturbed during construction will remain vulnerable to disturbance for some time into the	Regular monitoring for erosion after construction to ensure that no erosion problems have developed as result of the disturbance.	Project Developer	Operational	No additional Monitoring Requirements
		A maintenance management plan must be developed prior to the commencement of operations for inclusion within the EMPr, to			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
	operational phase and will require regular maintenance to ensure that erosion is minimised.	accommodate future maintenance/repairs that might be required for associated infrastructure.			
		Erosion management at the site should take place according to the Erosion and Rehabilitation Plans (Section 9.93 and Section 9.6). All roads and other hardened surfaces should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk.			
		All erosion problems observed must be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. Vegetation can be cut when dry and placed on the cleared areas if natural recovery is slow.			
BIO6	Alien plant invasion	Removal of the alien and weed species encountered on the property must take place in order to comply with existing legislation (amendments to the regulations under the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) and Section 28 of the National Environmental Management Act, 1998 (Act No. 107 of 1998)) Removal of species should take place throughout the construction, operational, and maintenance phases	Holder of the EA	Construction Operational Decommissioning	Regular alien monitoring and clearing should be conducted using the best-practice methods for the species concerned.
		Alien vegetation control should take place for a minimum period of two growing seasons after rehabilitation is completed.			
		Care should be taken with the choice of herbicide to ensure that no additional impact and loss of indigenous plant species occurs due to the herbicide used			
		Footprint areas should be kept as small as possible when removing alien plant species.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
		No vehicles should be allowed to drive through designated sensitive wetland areas during the eradication of alien and weed species.			
		The recovery of the indigenous shrub layer should be encouraged through leaving some areas intact through the construction phase to create a seed source for adjacent cleared areas.			
BIO9	Decommissioning will leave the site vulnerable to alien plant invasion.	Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.	Holder of the EA	Decommissioning	Regular monitoring for alien plants within the disturbed areas for at least two years after decommissioning.
		All above-ground infrastructure that cannot be used by Eskom, the landowner or an IPP or any other third party nominated by the IPP, must be removed from the site. Below-ground infrastructure such as cabling can be left in place if it does not pose a risk, as removal of such cables may generate additional disturbance and impact			

8.6.4 *CONSERVATION MANAGEMENT PLAN*

This section has been retained as it was part of the 2019 EMPr. However, it must be noted that the Part 2 Amendment Application recently submitted for the Rietkloof WEF (Ref: 14/12/16/3/3/1/1977/AM1) requests the removal of this requirement from the EA and subsequently the EMPr on the basis of discussions with Cape Nature as well as professional opinions. These opinions are included in the Draft Amendment Report that accompanies the Part 2 Amendment Application.

A potential concern associated with the proposed Rietkloof WEF is the impact on CBAs and associated broad-scale ecological processes. Impacts on plant species of conservation concern (SCC) have been effectively avoided at the planning stage through the delineation of no-go areas associated with populations of SCC. As a result, the primary residual impact that requires further mitigation is the impact on ecological processes.

Currently, the major negative impact on biodiversity at the site proposed for development, is heavy grazing pressure from livestock. Due the low general palatability of the vegetation of the area, the more palatable elements of the vegetation are vulnerable to overgrazing and negative impacts of livestock are prevalent in many areas within the Nama Karoo. This has negative consequences for the diversity and condition of the vegetation as well as the diversity of fauna present as many species are negatively affected by the decrease in vegetation cover associated with heavy grazing pressure or in the case of most antelope present in the area, compete directly with livestock for food resources. Although well-managed livestock grazing is compatible with biodiversity conservation, poor grazing management can lead to degradation and significant biodiversity loss at the landscape scale (Todd. *et a*l 2009). Due to the negative impacts of livestock on fauna and flora, releasing areas from livestock grazing or even reducing grazing pressure can significantly improve the use and value of these areas for biodiversity.

An option to mitigate the impacts of the Rietkloof development on CBAs would be to reduce or remove grazing pressure from selected parts of the site. This mitigation is considered to combine *avoidance*, *minimisation* and *rehabilitation* in the mitigation sequence. Therefore, Rietkloof WEF can be supported with the implementation of a Conservation Management Plan.

This would be especially beneficial where the various gradients described above are present and would thus be enhanced through improved management.

Potential conservation properties were identified by the ecologist based on the following:

- **Landowner support:** The land portions where the landowners would potentially be willing to change their livestock and management practices to achieve the above outcomes.
- **Extent:** The total extent of these land portions is over 4000 ha and are very well-positioned to enhance the connectivity and functioning of the landscape.
- **Gradient:** The six land portions include a gradient from the low-lying plains in the south to the high-lying hills in the north as well as a significant east-west gradient.
- **Vegetation types:** all three affected vegetation types are present.

Potential Conservation Properties refers to the six potential properties for the establishment of the Conservation Area including the Remainder of Farm 77 Hartjieskraal, the Remainder of Farm 80 Snyders Kloof, Portion 1 of the Farm Snyders Kloof 80, Farm 81 Vogelstruisfontein, Portion 1 of Farm 88 Rietkloof Annexe and the Remainder of the Farm Wilgehout Fontein 87.

The proposed mitigation measure is therefore to reduce grazing pressure on selected land portions from Potential Conservation Properties and provide a low-disturbance area that can act as a refuge for fauna and flora and as such enhance ecological processes in the area in order to mitigate impacts on the same ecological processes associated with the WEF.

The exact extent within the Potential Conservation Properties to be conserved ("Conservation Area"), shall be no less than 4000 ha, and shall be based on the footprint and layout of the final site development plan, the connectivity and diversity of the properties and/or areas to be conserved in terms of the gradient and topography.

The intention is not to withdraw this Conservation Area from all use, but rather to implement management that is seen as favourable and compatible with conservation orientated outcomes. An important role of these areas would

be to provide a "safe space" where vegetation is not overgrazed and where fauna can retreat from disturbance on the WEF or exist in a low-disturbance environment with contrasting land use to the remainder of the site and the wider area in general. As, such best-practice management practices should be implemented for the Conservation Area with regards to grazing management as well as predator control and general management as detailed in this Conservation Management Plan. In addition, it is important that follow-up monitoring is conducted firstly to ensure compliance with the management plan; secondly to validate that there are benefits resulting from the applied management as well as respond to changes that may occur as a result of the changes.

It is however also important to consider the context of these measures within the broader South African environment and in particular the current land debate. Withdrawing land from production is seen as undesirable, both from an economic and food security point of view. Maintaining some production is therefore seen as a key goal of the management plan, but this must be played off against the diminishing biodiversity returns associated with increasing output, whether this be from game or livestock. In addition, it is worth noting that some alternative income generating activities that might otherwise have been available, such as tourism are either unavailable or difficult to implement within an operational WEF context. The Rietkloof site is considered to be a broadly sensitive environment due to the presence of numerous species and habitats of conservation concern. The distribution of these has however been mapped in detail and effective avoidance implemented with regards to the layout of the proposed WEF. Although the majority of the site falls within a CBA, this impact can be effectively mitigated through the implementation of this proposed conservation management plan on selected properties within the site in order to enhance the ecological processes that may have been negatively affected by the WEF.

The intention is not to remove these areas from production entirely, but rather to improve management practices in these areas such that ecological processes are enhanced.

INTENDED OUTCOME OF CONSERVATION MANAGEMENT PLAN

The **purpose** of this Conservation Management Plan is to:

- Reduce existing grazing pressure on the Conservation Area within the Potential Conservation Properties to provide a "safe space" where vegetation is not overgrazed and where fauna can retreat from disturbance on the WEF or exist in a low-disturbance environment with contrasting land use to the remainder of the site and the wider area in general; and
- Through follow-up monitoring ensure compliance with the management plan;
- Validate that there are benefits associated with it; and
- Ensure that there's no further Degradation[11].

CONSERVATION MANAGEMENT PLAN AND MONITORING

STOCKING RATES

The biophysical environment can support a fixed number of animals (livestock and wildlife) at any given time while maintaining the vegetation in a good condition. This is referred to as the grazing capacity of land and is expressed as the number of animals per hectare (hectare per large-stock unit), or roughly how many hectares are required to provide food for one head of cattle weighing 450 kg. The carrying capacity fluctuates from year to year depending primarily on the amount and timing of rainfall. The carrying capacity is usually calculated at the level of the entire farm per annum and not at the level of the specific camp that is being grazed.

The stocking rate refers to the number of animals per unit area which is maintained on the farm. Stocking rate must be considered the single most important determinant of the ecological sustainability of the farming enterprise. This is because the stocking rate is the primary determinant of the amount of vegetation biomass that will be removed by the livestock on the farm each year, and hence the impact that the livestock will have on the vegetation. The exact pattern in time and space in which this biomass is removed will be determined by the grazing

[11] Degradation refers to the long-term loss of productive potential of the rangeland resulting from negative changes which are not likely to remedy themselves even under appropriate management within 25 years.

system. Recommended stocking rates have been developed for the whole of South Africa. However, these are derived from the mean annual rainfall and are applicable only at a very broad scale.

The recommended stocking rates provided by the Department of Agriculture are however only a rough guide and to determine the appropriate stocking rate of a specific farm, local factors such as the nature and abundance of different veld types must be taken into consideration. **It is recommended that the stocking rate of livestock should be maintained at 50% of that recommended for livestock in the area**.

It is recommended that the Conservation Area are stocked with Appropriate Game species and significantly reduced livestock numbers. This will encourage the use of this area by indigenous fauna species as many of these avoid livestock and move out of an area when there are livestock present. However, the switch from livestock to game is not sufficient to ensure that the vegetation is not overgrazed. Game are more difficult to manage as they cannot usually be moved from camp to camp and also tend to use certain parts of a camp more heavily than others, with the result that certain areas tend be very heavily used by game with negative consequences. In addition, it is important that well-adapted game species able to survive without supplementary feeding should be used. However, there are some constraints in this regard as certain species can jump fences and require 2m high game fencing to keep them contained, while some species also require a certificate of adequate enclosure which requires that set fencing standards are present before they can be introduced. Species currently present in the area include Gemsbok, Blue Wildebeest and Eland. The Eland are not contained by normal stock fences and are free roaming in the area. The Blue Wildebeest are not considered highly suitable as the site is not within the natural range of the Blue Wildebeest and is more likely to be suitable for the Black Wildebeest although as these are grass-favouring species, the site is not considered highly suitable for either species. Gemsbok probably did not occur naturally in the Roggeveld but appear to be relatively well adapted to the area, especially where they have access to a range of elevations so that they can descend to low elevation areas during cold weather. Springbok are also suitable species for introduction in the low-elevation areas in the south of the site. The area has been identified as potential Cape Mountain Zebra habitat, but due to the hunting restrictions on this species (ToPS regulations), most landowners prefer to stock the Hartmann's or Burchell's Zebras. Due to the current popularity of game breeding in South Africa, it has become common practice to have numerous extra-limital species present on game farms. However, as many of these species cannot support self-sustaining populations and must be provided with supplementary feed, this is not recommended for the site and only species able to support themselves on the natural forage should be included. Potentially suitable or Appropriate Game include:

- Gemsbok (*Oryx gazelle*),
- Blue Wildebeest (*Connochaetes gnou*),
- Eland (*Taurotragus oryx*)
- Black Wildebeest (*C. taurinus*); and
- Springbok (*Antidorcas marsupialis*).
- Other species such as Blesbok/ Bontebok that may be suitable for introduction should be identified in collaboration with CapeNature[12].

Due to the problems with managing the distribution of game grazing impact, it is recommended that the **stocking rate of game should be maintained at 50% of that recommended for game in the area**. Game numbers should be counted every year and numbers adjusted downwards every year or second year, when they exceed the recommended stocking rate by more than 30%.

In summary the following principles are recommended:

- Appropriate species mix should be used, these should preferably be species that are well adapted to the area and which do not need supplementary feeding. Species that can be contained by a standard 1.4m livestock fence should preferably be used as the fences required to keep larger species in may restrict the movement of naturally occurring smaller species, thereby diminishing the purpose of the conservation areas for enhancing connectivity. This does not limit the use of higher fences to contain other Appropriate Game species and or livestock.

[12] See CapeNature policy on game fencing accessed from http://www.capenature.co.za/wp-content/uploads/2014/03/Policy-on-Fencing-and-Enclosure-of-Game-February-2014-Draft.pdf on 16 August 2018

- If species that require a game fence are to be introduced and some or all or the area is to be fenced, no electrified fencing should be used within 30 cm of the ground. The fencing requirements for different species are available from the CapeNature website.
- Stocking rates for game and or livestock should be set at 50% of the recommended game/ livestock stocking rates respectively in order to ensure that area selection by game is reduced as far as possible
- The following naturally occurring species should not be hunted within the site; Steenbok, Duiker, Klipspringer and Grey Rhebok.
- The number of active watering points should be reduced and should be at least 5 km apart, unless they can be turned off and used in a rotational manner (although most antelope in the area are independent of water, watering points are still used by a variety of other animals such as jackal, caracal and baboon and spacing them further apart is a more natural situation).

The following monitoring requirements are recommended:

- Annual game counts of larger game (smaller species such as Klipspringer, Duiker and Steenbok can be counted but should not be controlled as their density is controlled by various environmental factors and do not contribute to overgrazing).
- Records of animal numbers removed each year through culling or game capture.
- Camera trapping at the site to confirm the composition of the mammalian community at the site and check for any changes in community composition that may require management. Camera trapping should be conducted over a 6-month period once every 3-5 years.

PREDATOR CONTROL

Although it would be ideal if predators were not controlled and control is not required as part of the management plan, in reality, predators may need to be controlled due to their impact on the game species being farmed or on livestock in the adjacent areas. No unselective predator control methods should be used, this includes poisons and any type of foothold or spring trap. Baited cage traps could potentially be used for caracal but should be checked on a regular basis and any non-target species released unharmed. The best-practice method is night hunting with a spotlight so that only target species are controlled. In terms of the site, it is possible that Leopards are present and measures should be taken to ensure that no Leopards are impacted by the control measures. In addition, unless there are actual losses to predators confirmed from the area, then predator control should not be implemented. In other words, predator control should occur in response to confirmed predation and should not occur indiscriminately. It is usually only a small fraction of the predator population that predate on livestock, so ideally, control should target the problem individuals. As predators such as jackal maintain territories controlled by dominant pairs, untargeted control can break the dominance of these pairs and result in increased breeding by subdominant pairs present in the area and ultimately increase the overall predator population.

The following management principles should be implemented:

- Only jackal and caracal should be controlled. Baboons can also be problematic around croplands and may also take young lambs or goat kids and as such some baboon control may be necessary. However, no baited poisons should be used and only CapeNature approved control methods should occur and with the appropriate permits.
- Only targeted control should be used where and when confirmed cases of predation on livestock or game occurs. The least impact, best practice control method is usually considered to be night hunting with spotlights and calls, if necessary. Guard dogs, night kraaling and fencing are also suitable passive management measures.
- No leghold or other spring traps, cyanide cannons, coyote getters, etc should be used.
- Should any other damage causing animal such as locusts or porcupines become a serious problem in the future, management measures in line with the best practice at the time may be implemented. This would usually involve the use of avoidance techniques before lethal methods are used.
- The following monitoring requirements are recommended:
- Cases of predation on livestock and game should be recorded and photographed for documentation purposes.
- Any predators controlled should be recorded.

CONTROL OF ALIEN SPECIES

Alien plants pose a threat to biodiversity as they take up space and use resources that would otherwise have been used by indigenous species as well as disrupt many ecological and hydrological processes. Alien species are regulated under the Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA) and the government notice 599 of 2014 in terms of NEM:BA which lists alien and invasive species under different categories. Alien vegetation must be managed to maintain biodiversity.

The following management principles should be implemented:

- The control measure should be as selective as possible, and caution should be exercised to ensure that effects on non-target species are kept to a minimum.
- Avoid interventions such as large-scale clearing, poisoning or brush-cutting of poisonous or unpalatable plants. Total removal of plants can cause soil erosion and increase the harshness of the environment, making the establishment of desirable species even more difficult to achieve.
- Extreme caution should be exercised if control is to be achieved through the use of herbicides as the potential for ecosystem effects is potentially high when using herbicides that are highly persistent in the soil.

NEW OR EXISTING CROPPING LANDS

Ploughing of new or existing fields is covered by the CARA. This Act is administered by the Department of Agriculture, and the aim of this Act is to provide for the conservation of the natural agricultural resources of South Africa "… *by the maintenance of the production potential of land, by the combating and prevention of erosion and weakening or destruction of water sources, and by the protection of the vegetation and the combating of weeds and invader plants*".

The following management principles should be implemented:

- If applicable, a permit should be requested from the Department of Agriculture in line with the prevailing legislation.
- New cropping lands should be established on suitable topography to limit erosion.

GENERAL MANAGEMENT

There should be general erosion control and management at the site, as well as alien clearing especially in the river courses where woody aliens are present. This should occur in line with the Alien Management Plan and Soil Protection Plan that have been drafted as part of the EMPr (**Appendix R**) for the development. Access and activity within the Conservation Area should be managed and regulated. Potentially, the area could be used for tourism or similar activity, but noisy activities such as quad-biking should not be allowed. As an important role of the area is for faunal movement, fences should not be electrified and can be reduced in number were feasible. Pets should only be allowed if owned by the landowners or the tourists visiting the area. Landowners would be allowed to undertake the peripheral activities required to ensure that the farm can continue to be operated for agricultural purposes, albeit at a reduced intensity. A form of tourism and recreation that can contribute to income generation and also assist with species control would be hunting.

Any new roads, fencing, access to water, new buildings and associated infrastructure required from time to time for agricultural or tourism purposes may be constructed as long as it adheres to the prevailing environmental law.

The following general reporting principles are recommended:

- A report on the management of the Conservation Area and results from the other monitoring and management intervention actions should be prepared and submitted to CapeNature every 5 years.
- The report should be prepared by a suitable specialist and should include recommendations for changes to the current management actions and practices with recommendations for additional or changes to the monitoring regime as appropriate.

Although the majority of the site falls within a CBA, this impact can be effectively mitigated through the implementation of appropriate management on selected properties within the site in order to enhance the ecological processes that may have been negatively affected by the WEF.

8.7 AVIFAUNAL MANAGEMENT

8.7.1 *OBJECTIVES*

To ensure that impacts to avifauna are ameliorated.

8.7.2 *INDICATOR AND COMPLINACE MECHANISM/ OUTCOMES*

The following indicator and compliance mechanisms are applicable:

- Induction training and records;
- Incident classification and reporting management procedure (to be developed);
- Environmental awareness programme/toolbox talks; and
- Avifauna monitoring procedure (to be developed).

8.7.3 *MITIGATION AND MANAGEMENT MEASURES*

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
AV1 **AV2** **AV3** **AV5**	Plan for minimal bird fatalities from the facility	An additional 6-months of pre-construction monitoring undertaken as prescribed by the DFFE	Holder of the EA EO ESCO / ECO Contractor	Design and Planning Construction Operation	Additional Monitoring Requirements are included in the Construction and Operational Management Plan included in **Appendix D**.
		Construction-phase and post-construction phase monitoring be undertaken for a minimum of 24 months to inform the possible, and actual, impacts to the avian community.			
		If the post-construction monitoring indicates that one or more highly threatened Red Data raptors are killed at one turbine then an adaptive			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
		management plan must be initiated to reduce the fatalities within two months. An automated shut down-on-demand system for each problem turbine is recommended.			
		Avoid road or powerline construction within 500-m of active nests of Red Data species during the early breeding season. For Verreaux's Eagles this is May-July and again in August-September when small vulnerable nestlings are present (Simmons 2005). Should Endangered Black Harriers be found breeding, construction should be avoided in August-September.			
		To mitigate potential impacts on the Black Harrier, the following is recommended that in the event the client has the opportunity to drop additional turbines from the authorised layout in the future, that they do so from the northern ridge, that is: turbines R30, R31, R32, R33. If this compromises the energy yield of the wind farm, then these four turbines can remain, but they should be mitigated with striped-blade mitigation and/or automated SDOD or observer-lead SDOD.			
		The facility must be designed in a manner such that infrastructure components that could be used as perching or roosting substrates by birds must be prohibited.			
		Adhere to the sensitivity map during turbine placement.			
		Construction activities should be kept to a minimum in terms of space and time. Construction of sub-stations should, where possible, be timed to avoid the main breeding season for local birds which is the period August to October inclusive.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
		Where overhead 33kV powerlines are required, these should preferably not cross valleys and if they do so must have bird diverters at 5 m intervals along the line.			
		Ensure the rotor blades are as high as possible off the ground.			
		Bury powerlines where possible and minimize powerline crossing of valleys.			
AV2 **AV4** **AV-C1**	Disturbance of Avifauna	Where overhead powerlines cross saddles and valleys, bird flight diverters must be placed on the line at a spacing of m. It is accepted that diverters are likely to deteriorate across the operational life of the lines.	EO ESCO / ECO Contractor	Design and Planning Construction Operational	
		During construction habitat destruction must be kept to a minimum, especially so in the valley bottoms and lower slopes where resources, and so bird numbers, are greatest.			
		No turbines must be erected within 3km of Verreaux's Eagle nest or 1.5km from the Dassie colony and the farm track that runs between the two localities must not be used for this development.			
AV-C2	Electrocution (Cumulative)	Use of Eskom approved perch preventers on pylons	Holder of the EA EO ESCO / ECO Contractor	Operational	

8.8 BATS

8.8.1 *OBJECTIVES*

To ensure that impacts to bats are ameliorated.

8.8.2 *INDICATOR AND COMPLIANCE MECHANISMS / OUTCOMES*

The following indicator and compliance mechanisms are applicable:

- Induction training and records;
- Incident classification and reporting management procedure (to be developed);
- Environmental awareness programme/toolbox talks; and
- Bat monitoring plan.

8.8.3 *MITIGATION AND MANAGEMENT MEASURES*

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
BAT1	Destruction of bat roosts due to earthworks and blasting	Adhere to the sensitivity map during turbine placement.	Holder of the EA ESCO	Design and Planning Construction Operation	Additional Monitoring Requirements are included in the Bat Monitoring Plan included in **Appendix E**.
		Blasting must be minimised and used only when necessary,			
		A 200m buffer from the tip of the rotor blade to identified sensitive bat areas must be maintained.			

BAT2	Loss of foraging habitat	Keep to designated areas when storing building materials, resources, turbine components and/or construction vehicles and keep to designated roads with all construction vehicles. Damaged areas not required after construction should be rehabilitated by an experienced vegetation succession specialist.	EO ESCO / ECO Contractor Bat Specialist		
BAT 3	Plan for minimal bat fatalities from the facility	Should a turbine with 180m rotor diameter be utilised, Turbines 27, 37 and 49 should be relocated outside of the high bat sensitivity buffer Implement an operational (post construction) bat monitoring plan, in line with applicable guidelines, for a minimum of two years to determine long term impacts of the development, as well as assess and/or modify the effectiveness of the mitigation measures on bat communities. The facility must be designed in a manner such that infrastructure components that could be used as perching or roosting substrates by bats must be prohibited.			
BAT4	Increased likelihood of impacts on bats due to artificial lighting.	Lights must be equipped with low sensitivity passive motion sensors that will only switch on when a person is near the turbine base. This mitigation is very simple and effective to apply, but can have severe effects if not applied.	Holder of the EA	Operational	
BAT5	Loss of foraging habitat.	Keep to designated areas when storing building materials, resources, turbine components and/or heavy vehicles. Keep to designated roads with all heavy vehicles.	EO ESCO / ECO Contractor	Decommissioning	

		Damaged areas not required after construction should be rehabilitated by an experienced vegetation succession specialist.			

The mitigation schedule outlined in the table below is based on the passive data collected. The data infers that mitigation be applied during the peak activity periods and times, and when the advised wind speed and temperature ranges are prevailing simultaneously (considering conditions in which 80% of bat activity occurred). Bat activity at 50m height is used in cases where elevated activity occurred at this height. In other cases bat activity at 10m were used, since bats are expected to move in an upwards fashion towards turbine blades (bat activity negatively correlated with height above ground).

TERMS OF MITIGATION IMPLEMENTATION

Summer peak activity (times to implement curtailment/ mitigation)	Barendskraal SE: Month of December Sunset – 00:00
Environmental conditions in which to implement curtailment/ mitigation	Below 5m/s measured at nacelle height Above 11°C
Summer peak activity (times to implement curtailment/ mitigation)	Rietkloof: Month of December Sunset – 02:00
Environmental conditions in which to implement curtailment/ mitigation	Below 4.5m/s measured at nacelle height Above 12°C

Mitigation options include curtailment, blade feathering, blade lock, acoustic deterrents or light lures. The following terminology applies:

- **Curtailment:** Curtailment is defined as the act of limiting the supply of electricity to the grid during conditions when it would normally be supplied. This is usually accomplished by locking or feathering the turbine blades, with the aim to raise the cut-in speed without free-wheeling.
- **Cut-in speed:** The cut-in speed is the wind speed at which the generator is connected to the grid and producing electricity. For some turbines, their blades will spin at full or partial Revolutions per Minute (RPMs) below cut-in speed when no electricity is being produced.
- **Feathering or Feathered:** Feathering refers to adjusting the angle of the rotor blade parallel to the wind, or turning the whole unit out of the wind, to slow or stop blade rotation. Normally operating turbine blades are angled almost perpendicular to the wind at all times.
- **Free-wheeling:** Free-wheeling occurs when the blades are allowed to rotate below the cut-in speed or even when fully feathered and parallel to the wind. In contrast, blades can be "locked" and cannot rotate, which is a mandatory situation when turbines are being accessed by operations personnel.
- **Acoustic deterrents:** This is a developing technology and will need further investigation closer to time of wind farm operation; opportunities to test such devices may be available during the operation of the facility.
- **Increasing cut-in speed:** The turbine's computer system (referred to as the Supervisory Control and Data Acquisitions or SCADA system) is programmed to a cut-in speed higher than the manufacturer's set speed, and turbines are programmed to be feathered at 90° until the increased cut-in speed is reached over some average number

of minutes (usually 5 – 10 min), thus triggering the turbine blades to pitch back “into the wind” and begin to spin normally and produce power. Blade locking or feathering that renders blades motionless below the manufacturers cut-in speed, and don’t allow free rotation without the gearbox engaged, is more desirable for the conservation of bats than allowing free rotation below the manufacturer’s cut-in speed. This is because bats can still collide with rotating blades even when no electricity is being produced.

Currently the most effective method of mitigation, after correct turbine placement, is alteration of blade speeds under environmental conditions favourable to bats.

A basic "6 levels of mitigation" (by blade manipulation or curtailment), from light to aggressive mitigation is structured as follows:

1. No curtailment (free-wheeling is unhindered below manufacturer’s cut-in speed so all momentum is retained, thus normal operation).
2. Partial feathering (45-degree angle) of blades below manufacturer’s cut-in speed in order to allow the free-wheeling blades half the speed it would have had without feathering (some momentum is retained below the cut-in speed).
3. Ninety-degree feathering of blades below manufacturer’s cut-in speed so it is exactly parallel to the wind direction as to minimize free-wheeling blade rotation as much as possible without locking the blades.
4. Ninety-degree feathering of blades below manufacturer’s cut-in speed, with partial feathering (45-degree angle) between the manufacturer’s cut-in speed and mitigation cut-in conditions.
5. Ninety-degree feathering of blades below mitigation cut-in conditions.
6. Ninety-degree feathering throughout the entire night.

Actual impacts on bats will be monitored during the operational phase monitoring, and the potential mitigation measures and levels of curtailment as detailed in table 17 will be adjusted according to the results of the operational monitoring. This is an adaptive management approach, and it is crucial that any suggested changes to the initial proposed mitigation schedule be implemented within maximum 2 weeks from the date of the recommendation, unless the recommendation refers to a time period later in the future (e.g. the following similar season/climatic condition).

8.9 SURFACE WATER MANAGEMENT

8.9.1 *OBJECTIVES*

To prevent any disturbance or contamination of water resources, and associated vegetation

8.9.2 INDICATOR AND COMPLIANCE MECHANISM/OUTCOMES

The following indicator and compliance mechanisms are applicable:

- Induction training and records;
- Authorisation by means of a Water Use Licence Application (WULA) in terms of Sections 21 (a), (c) and (i) of the National Water Act, 1998 (Act No. 36 of 1998);
- Incident classification and reporting management procedure (to be developed);
- Environmental awareness programme/toolbox talks;
- Stormwater Management Plan (Section 9.5); and
- Waste Management Plan (Section 9.11).

8.9.3 MITIGATION AND MANAGEMENT MEASURE

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
SW1 **SW2** **SW3** **SW4** **SW5**	Impact on watercourse vegetation, associated habitat and ecosystem services	All development footprint areas to remain as small as possible and vegetation clearing to be limited to what is essential. It must be ensured that the watercourse habitat is off-limits to construction vehicles and non-essential personnel.	EO ESCO / ECO Contractor Holder of the EA	Construction Decommissioning	No additional monitoring required.
		The boundaries of footprint areas, including contractor laydown areas, are to be clearly defined and it should be ensured that all activities remain within defined footprint areas. Edge effects will need to be extremely carefully controlled.			
		Planning of temporary roads and access routes (if applicable) should avoid watercourses and be restricted to existing roads where possible.			
		Appropriate sanitary facilities must be provided for the life of the construction phase and all waste removed to an appropriate waste facility.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
		All hazardous chemicals as well as stockpiles should be stored on bunded surfaces and have facilities constructed to control runoff from these areas.			
		It must be ensured that all hazardous storage containers and storage areas comply with the relevant SABS standards to prevent leakage			
		Ensuring that an adequate number of waste and "spill" bins are provided will also prevent litter and ensure the proper disposal of waste and spills.			
		No stockpiling of topsoil is to take place within the recommended buffer zone around the watercourses (unless specified otherwise), and all stockpiles must be protected with a suitable geotextile to prevent sedimentation of the watercourses.			
		All structures crossing streams must be located and constructed so that they do not decrease channel stability or increase water velocity.			
		Construction of temporary berms and drainage channels to divert surface water.			
	Awareness and Training	Workers must be made aware of the importance of not destroying or damaging the vegetation along rivers, of not polluting rivers or wetlands and of not undertaking activities that could result in such pollution.	EO ESCO / ECO Contractor	Construction Operation De-commissioning	

8.10 AIR QUALITY MANAGEMENT

8.10.1 *OBJECTIVES*

To ensure that impacts to air quality of the surrounding environment are ameliorated.

8.10.2 *INDICATOR AND COMPLIANCE MECHANISMS/ OUTCOMES*

The following indicator and compliance mechanisms are applicable:

- Complaints register;
- Incident reporting system;
- Health, safety, environmental and community incident and complaints management system register;
- Incident Classification and Reporting Management Procedure (to be developed); and
- Equipment, machinery and vehicle maintenance/inspection registers.

8.10.3 *MITIGATION AND MANAGEMENT MEASURE*

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
EMP60	Dust	Before the commencement of any site works and during the operation, as much vegetation as possible must be retained, including patches and strips to minimise dust.	EO ESCO / ECO Contractor	Construction Decommissioning	No additional monitoring required.
EMP61		Activities with high dust-causing potential, such as topsoil stripping, must not be carried out in sensitive areas during adverse wind conditions. When necessary, topsoil should be stripped in discrete sections, allowing buffer strips (windbreaks) between clearings, if possible.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
EMP62		Earth-moving works have the potential to generate large amounts of dust. Pre-planning of earth-moving works can reduce dust emissions by limiting the time the site is exposed. Options for dust control can include the following: – Plan earth-moving works so that they are completed just prior to the time they are needed – Observe weather conditions and do not commence or continue earth moving works if conditions are unsuitable e.g., under conditions of strong winds – Reduce off-site hauling via balanced cut and fill operations – Pre-water areas to be disturbed.			
EMP63		Material stockpiles can generate large amounts of dust. Fine materials stored in stockpiles can be subject to dust pick-up. Materials being loaded onto conveyor belts or into trucks are also potential sources of dust emissions. Dust emissions from material stockpiles can be minimised through the use of the following procedures: – Locate stockpiles in sheltered areas. Otherwise, stockpiles should be covered – Where stockpiles are located in open areas, limit the height and slope of the stockpiles to reduce wind pick up, orient stockpiles lengthwise into the wind so they offer the minimum cross-sectional area to prevailing winds, install wind barriers on three sides of the stockpile – Limit activity to the downwind side of the stockpile – Limit drop heights from loading facilities and use closed conveyors where possible Transfer points should also be minimised.			
EMP64		Dust emissions must be minimised using the following watering procedures:			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
		– The surface should be dampened to prevent dust from becoming airborne but should not be wet to the extent of producing run-off. Alternatively, wetting agents could be used, particularly for non-wetting soils – Watering is more effective when undertaken prior to strong breezes – Use watering sprays on materials to be loaded and during loading In cases where severe water restrictions are imposed, other measures like the use of wetting agents such as chemical stabilisation or hydromulch, must be considered. In situations where the use of water is necessitated, non-potable water sources are to be utilised.			
EMP65		Vehicles bearing open loads of potentially wind-borne materials must be covered in order to minimise dust entrainment.			
EMP66	Volatile Organic Compounds and Other Emissions	All equipment, machinery and vehicles should be fitted with appropriate emission control equipment, are maintained frequently and serviced to the manufacturers' specifications.	EO ESCO / ECO Contractor	Construction Operation De-commissioning	
EMP67		Ensure incident and complaint registers are established and maintained. They should be kept on site at all times.			
EMP68		Prohibit burning of waste or vegetation onsite, unless required by law.			

8.11 NOISE MANAGEMENT

8.11.1 *OBJECTIVES*

To ensure that noise impacts to the surrounding environment are minimal or mitigated.

8.11.2 *INDICATOR AND COMPLIANCE MECHANISM/ OUTCOMES*

The following indicator and compliance mechanisms are applicable:

- Complaints register;
- Incident reporting system;
- Health, safety, environmental and community incident and complaints management system register;
- Incident classification and reporting management procedure (to be developed); and
- Equipment, machinery and vehicle maintenance/inspection registers.

8.11.3 *MITIGATION AND MANAGEMENT MEASURES*

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
N1 **N2**	Increase in ambient noise levels	Where possible, all construction activities must only occur during daylight hours. Construction staff must receive "noise sensitivity" training such as switching off vehicles where not in use.	EO ESCO / ECO Contractor	Construction Operational Decommissioning	No additional monitoring required.

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
		No construction piling must occur at night where possible. Piling should only occur during the day to take advantage of unstable atmospheric conditions.			
		One ambient noise survey must be conducted at noise sensitive receptors during the construction phase.			
		The noise impact from the wind turbine generators should be measured during the operational phase, to ensure that the impact is within the required legal limits.			
EMP69	General Noise Management	Fit equipment, machinery and vehicles generating excessive noise with appropriate noise abatement measures and undergo regular maintenance to ensure optimum efficiency during operation.	EO ESCO / ECO Contractor	Construction Operation	
EMP70		Provide a complaint register to report any excessive noise incidents. Manage all complaints as per the Incident Classification and Reporting Management Procedure.			
EMP71		Regular maintenance of equipment to reduce the generation of additional unwanted noise.			
EMP72	Blasting	Should blasting activities be required, adequate blast management techniques should be employed. These include: – Informing nearby residents as to when blasting will occur on a certain day at a given time; – Displaying highly visible blast notices along the roadside within a certain vicinity of the site in order to notify any passing receptors; – Not blasting after day-time hours.	EO ESCO / ECO Contractor	Construction	

8.12 SITE OF CULTURAL, HERITAGE OR PALAEONTOLOGICAL SIGNIFICANCE

8.12.1 *OBJECTIVES*

To ensure that sites/artefacts of heritage or palaeontological value are identified and protected.

8.12.2 *INDICATOR AND COMPLIANCE MECHANISMS/ OUTCOMES*

The following indicator and compliance mechanisms are applicable:

- Health, safety, environmental and community incident and complaints management system register;
- Chance Find Procedure (Section 9.15);
- Heritage Conservation Management Plan (**Appendix F**)
- Incident Classification and Reporting Management Procedure (to be developed); and
- Monitoring and audit reports.

8.12.3 *MITIGATION AND MANAGEMENT MEASURES*

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
H1 **H6**	Destruction of precolonial / stone age material	The heritage walkdown report compiled for the final layout of the Rietkloof WEF must be submitted to Heritage Western Cape (HWC), the heritage authority for any Western Cape developments, and as a commenting authority in terms of the National Heritage Resources Act 25 of 1999, Section 38, if the comment issued for the exact same layout is not considered relevant by HWC.	EO ESCO / ECO Contractor	Construction	No additional monitoring required

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
		No turbines are to be constructed on Tafelkop, situated at the meeting of farm boundaries: Hartjieskraal 77, Vogelstruisfontein 81, Annex Hartjieskraal 82 and Rietkloof 88.			
		If concentrations of historical and pre-colonial archaeological heritage material and/or human remains (including burials and graves) are uncovered during construction, all work within close vicinity of the find must cease immediately and be reported the South African Heritage Resources Agency (SAHRA) (021 462 4502) or Heritage Western Cape (HWC) (021 483 5959) so that systematic and professional investigation/excavation can be undertaken.			
		An archaeological heritage walk-through survey must be conducted if any changes to the positions of the wind turbines, associated infrastructure and roads outside the scope of this study are made post the final layout and further recommendations and mitigation measures be suggested if necessary.			
		The upgrading of the road be limited to the existing internal road. It is expected that scatters of stone artefacts would be uncovered during the upgrade and construction of the access road. This has been established by observance and recording the extent of stone artefacts occurring along this route.			
		A detailed survey focusing on the floodplains must be conducted to establish the real extent of the artefact occurrences prior to development. Consultation with local Western Cape archaeological repositories (generally museums and universities) can be made to determine whether it would be necessary for to make a collection of artefacts.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
		Construction managers/foremen and/or the Environmental Control Officer (ESCO / ECO) should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.			
H2	Destruction of stone walling features	No development should occur within 20 m – 30 m of Stone Walling Features and associated Historical Artefact Scatters. The features should be clearly demarcated before any development activities begin to avoid any negative impact.	EO ESCO / ECO Contractor	Construction	
		A 30 m buffer be establishment around the kraal (RK_SW2 and RK_SW8). The buffer must be clearly demarcated as a no-go area.			
H3	Destruction of graves	The graveyard area (RK_G2) must be fenced off to avoid any possible damage to the graves and informal burials.	EO ESCO / ECO Contractor	Construction Decommissioning	
		If a grave or midden is uncovered on site, or discovered before the commencement of work, then all work in the immediate vicinity of the graves/middens shall be stopped and the Project Manager informed of the discovery. The Project Manager shall contact the ESCO / ECO and HWC or SAHRA to determine the way forward.			
H4	Destruction of homesteads/ farmhouses	Where possible, the existing road (RK_HS1 (Rietkloof 88)) must be diverted to the north of the demarcated Rietkloof homestead through floodplains to avoid having to go past the graveyard. If this is not possible, a 20- 30m buffer extending north of the farmhouse must be established.	EO ESCO / ECO Contractor	Planning and design Construction Decommissioning	

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
		If any of the old farm buildings are intended for rehabilitation or re-use or demolition a qualified and experienced professional (historical archaeologist / historical architect) must be consulted.			
		A 30 m buffer be established around the end portion of the wall at RK_HS2 and the buffer clearly demarcated.			
P1	Impacts on palaeontological heritage resources	Pre-construction survey by a professional paleontologist of two small areas in the eastern portion (Waterford Formation outcrop close to Kranskop) of the WEF project area to record, sample and safeguard any significant well-preserved fossil wood or other fossil material here.	EO ESCO / ECO Contractor	Construction Decommissioning	
		The concentration of blocks and logs of well-preserved petrified wood from the Waterford Formation exposed on the slopes of Kranskop, Wilgehout Fontein 87, which lies well outside the WEF development footprint, should not be disturbed.			
		Monitoring of all major surface clearance and deeper (> 1m) excavations for fossil material (bones, teeth, petrified wood etc.) by the ESCO / ECO on an on-going basis during the construction phase. Significant fossil finds to be reported to Heritage Western Cape for recording and sampling by a professional paleontologist;			
		Should substantial fossil remains - such as vertebrate bones and teeth, or petrified logs of fossil wood - be encountered at surface or exposed during construction, the ESCO / ECO should safeguard these, preferably in situ. They should then alert Heritage Western Cape (HWC) as soon as possible (Contact details: Protea Assurance Building, Green Market Square, Cape			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
		Town 8000. Private Bag X9067, Cape Town 8001. Tel: 086-142 142. Fax: 021-483 9842. Email: hwc@pgwc.gov.za.			
		The paleontologist concerned with mitigation work will need a valid fossil collection permit from Heritage Western Cape and any material collected would have to be curated in an approved depository (e.g. museum or university collection). All paleontological specialist work would have to conform to international best practice for paleontological fieldwork and the study (e.g. data recording fossil collection and curation, final report) should adhere as far as possible to the minimum standards for Phase 2 paleontological studies developed by SAHRA (2013).			
		Should fossils be discovered before or during construction and reported by the responsible ESCO / ECO to the responsible heritage management authority (HWC) for professional recording and collection.			

8.12.4 *LOCATION OF HERITAGE ITEMS IDENTIFIED*

Error! Reference source not found. provides the coordinates for all items identified within the Heritage Impact Assessment and Error! Reference source not found. provides archaeological and built environment observations noted during the walk down of the WEF and associated infrastructure.

Table 8-2: Coordinates and sites for the proposed Rietkloof Wind Energy Facility (WEF) situated in the Witzenburg Local Municipality and Laingsburg Local Municipality, Cape Winelands and Central Karoo District Municipalities.

REFERENCE	DESCRIPTION	CO-ORDINATE	HERITAGE GRADING
Homesteads situated within the Rietkloof WEF area			
RK_HS1	Original Rietkloof homestead and farmhouse	33°06'19.68"S; 20°32'05.31"E	Not graded
RK_HS2	Vogelstruisfontein 81	33°05'37.27"S; 20°28'46.76"E	Not graded
RK_HS3	Snyderskraal	33°06'17.74"S; 20°25'51.20"E	Not graded
RK_HS4	Snyderskraal	33°04'39.91"S; 20°25'11.85"E	Not graded
RK_HS5	Hartjieskraal 77	33°03'29.58"S; 20°29'25.32"E	Not graded
RK_HS6	Die Libanon	33°02'49.61"S; 20°27'59.66"E	Not graded
Stone Artefact Occurrences, Scatters and Sites			
RK_SA1	Stone artefact scatters	33°06'20.02"S; 20°32'20.66"E	'General' Protection B (Field Rating IV B) *IIIB*
RK_SA2	Stone artefact scatters	32°06'11.74"S; 20°32'28.55"E	'General' Protection B (Field Rating IV B) *IIIB*
RK_SA3	Stone artefact scatters	33°05'00.63"S; 20°32'15.25"E	'General' Protection B (Field Rating IV B) *IIIB*
RK_SA4	Stone artefact scatters	33°05'52.27"S; 20°29'23.65"E	'General' Protection B (Field Rating IV B) *IIIB*
RK_SA5	Stone artefact scatters	33°05'25.31"S; 20°29'00.74"E	'General' Protection B (Field Rating IV B) *IIIB*
RK_SA6	Stone artefact scatters	33°03'51.88"S; 20°29'03.69"E	'General' Protection B (Field Rating IV B) *IIIB*
RK_SA7	Stone artefact scatters	33°03'32.98"S; 20°29'39.89"E	'General' Protection B (Field Rating IV B) *IIIB*
RK_SA8	Stone artefact scatters	33°03'25.32"S; 20°29'51.36"E	'General' Protection B (Field Rating IV B) *IIIB*
Graves / Burials			
RK_G1	Associated with RK_HS1 – the original Rietkloof farmhouse and homestead	33°06'24.58"S; 20°32'08.01"E	*High Significance*
RK_G2	Vogelstruisfontein 81	33°05'33.42"S; 20°28'35.20"E	*High Significance*
RK_G3	Hartjieskraal 77	33°03'36.29"S; 20°29'28.23"E	*High Significance*
Stone walling features			
RK_SW1	Kraal associated with the original Rietkloof homestead	33°06'21.47"S; 20°32'02.53"E	*Grade IIIC significance*
RK_SW2	Large kraal, Rietkloof 88	33°05'07.42"S; 20°32'00.86"E	*Grade IIIC significance*
RK_SW3	Circular stone packed feature, Rietkloof 88	33°05'01.11"S; 20°32'12.32"E	*Grade IIIC significance*

REFERENCE	DESCRIPTION	CO-ORDINATE	HERITAGE GRADING
RK_SW4	Stone packed dwelling, Rietkloof 88	33°05'01.23"S; 20°32'15.25"E	*Grade IIIC significance*
RK_SW5	Stone packed boundary wall, Vogelstruisfontein 81	33°05'21.92"S; 20°29'21.77"E	*Grade IIIC significance*
RK_SW6	Stone packed dwelling, Hartjieskraal 77	33°02'47.02"S; 20°30'34.95"E	*Grade IIIC significance*
Historical Artefacts Occurrences, Scatters and Sites			
RK_Hist1	Historical artefact scatter associated with the original Rietkloof homestead	33°06'23.52"S; 20°32'06.70"E	'General' Protection B (Field Rating IV B) *IIIB*
Built Environment (structures, buildings, drinking troughs, reservoirs, etc.)			
RK_BE1	Modern buildings associated with the original Rietkloof homestead	33°06'21.18"S; 20°32'05.51"E	N/A
RK_BE2	Drinking trough / kraal	33°05'18.60"S; 20°32'04.81"E	N/A
RK_BE3	Reservoir	32°05'30.33"S; 20°28'21.09"E	N/A
RK_BE4	Reservoir	33°03'32.47"S; 20°29'39.91"E	N/A
RK_BE5	Reservoir / kraal	33°02'57.78"S; 20°30'33.40"E	N/A
RK_BE6	Reservoir	32°02'49.61"S; 20°27'59.66"E	N/A

Table 8-3: Archaeological and built environment observation noted during the Rietkloof WEF walkdown

REFERENCE	DESCRIPTION	CO-ORDINATE	HERITAGE GRADING
RK001	Chert core, patinated hornfels flakes, Artefacts on level ground, small pans but quite rocky	-33.08508S; 20.59137E	NCW (Not conservation worthy)
RK002	Patinated hornfels flakes in pan	-33.08766S; 20.58939E	NCW
RK003	Chert and hornfels cores	-33.08808S; 20.58759E	NCW
RK004	Hornfels biface	-33.0875S; 20.58678E	NCW
RK005	Hornfels biface	-33.08242S; 20.58963E	NCW
RK006	Stone walled kraal 50x25m	-33.08555S; 20.53359E	IIB
RK007	Matjiesfontein chert formal retouched flake. Chert flakes dropped on slopes of large valley below	-33.08518S; 20.53314E	NCW
RK008	Chert bladelet and flake	-33.08461S; 20.53302E	NCW

REFERENCE	DESCRIPTION	CO-ORDINATE	HERITAGE GRADING
RK009	Hornfels flake. Artefacts dropping off on ridges considerably	-33.08148S; 20.53103E	NCW
RK010	Chert flake. Isolated flake on top of ridge which was unusual, not part of larger site	-33.08025S; 20.51256E	NCW
RK011	Chert flake	-33.07075S; 20.46493E	NCW
RK012	Chert, hornfels, quartzite flakes	-32.99232S; 20.5421E	NCW
RK013	Isolated chert flake	-33.03938S; 20.52984E	NCW
RK014	Farmers trap, corrugated sheet, wire, wooden post	-33.02031S; 20.41447E	NCW

8.13 VISUAL IMPACT MANAGEMENT

8.13.1 *OBJECTIVES*

To ensure that the changes to the landscape character of the area are mitigated to minimise the negative impact.

8.13.2 *INDICATOR AND COMPLIANCE MECHANISMS/ OUTCOMES*

The following indicator and compliance mechanisms are applicable:

- Health, safety, environmental and community incident and complaints management system register;
- Incident classification and reporting management procedure (to be developed); and
- Monitoring and audit reports.

8.13.3 *MITIGATION AND MANAGEMENT MEASURES*

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
V1 **V7**	Visual impact during construction due to dust, vehicles and equipment	Clearly demarcate construction areas as far as possible to minimise site disturbance.	EO ESCO / ECO Contractor	Construction Decommissioning	No additional monitoring requirements
		Minimise vegetation clearing and rehabilitate cleared areas as soon as possible. Vegetation clearing should take place in a phased manner			
		Limit the number of vehicles and trucks travelling to and from the construction, where possible.			
		Roads should be treated with appropriate dust suppressant mechanisms to reduce dust emissions.			
		The site must be kept neat and tidy. The ESCO / ECO must organise waste clean-ups on a regular basis. Littering must be fined.			
		Night lighting of the construction sites must be minimised within requirements of safety and efficiency.			
V2 **V7**	Impact of construction camps on visually receptors	Carefully plan to minimise the construction and decommissioning period and avoid construction delays.	EO ESCO / ECO Contractor	Construction Decommissioning	
		Inform any receptors within 500m of construction works of the construction and decommissioning programme and schedules.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
		All infrastructure that is not required for post-decommissioning use should be removed.			
		The screening capacity of the site can be enhanced by attaching shade cloth to the fence around the construction camp. The colour of the shade cloth should be similar to that of the adjacent vegetation.			
		Remove any waste products from the site or contain it in an enclosed area out of the sight from viewers.			
V3 **V6**	Impact of wind turbines on visually sensitive points and areas	Turbines must be properly maintained.	EO ESCO / ECO Contractor	Construction Operational	
		Signs near wind turbines must be avoided unless they serve to inform the public about wind turbines and their function. Advertising billboards must be avoided.			
		Lighting must be designed to minimise light pollution without compromising safety. Investigate using motion sensitive lights for security lighting.			
		The aviation standards must be followed, unless alternative solution is approved by the CAA e.g. pilot activated lighting system to ensure lights are only switched on when an aircraft is in close proximity to the site.			
		Lighting of ancillary buildings and structures should be designed to minimise light pollution without compromising safety. Motion sensitive lighting can be used for security purposes.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
		Wind turbines shall be painted bright white to provide 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.			
V4	Impacts of access roads on visually sensitive receptors	The road surface must be maintained periodically and erosion along the shoulder must be controlled to avoid unsightly damages to the road and surroundings.	Holder of the EA	Operational	
		Make use of existing gravel access roads where possible.	EO ESCO / ECO Contractor	Construction Operational	
V5	Impact of substations on visually sensitive receptors	Locate on-site substations in the least visible areas. Make use of the natural screening capacity of the site by placing these facilities in the lower lying areas to conceal these project components.	Holder of the EA Contractor	Construction Operational	
		Increase the screening capacity of the site by planting vegetation around the substation if permissible by Eskom standards. Shade cloth must be attached to the fence around the construction substation site while screen planting is being established. The colour of the shade cloth must be similar to that of the adjacent vegetation.			
		Electrical structures should have a non-reflective finish.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
		Buildings facades and roofs must preferably be painted or finished with natural earth tones.			
		Lattice structures are preferred to solid structures since they create lower visual contrast with natural landscape features and therefore must be used where possible.			
EMP73	Detailed design and specification	Design buildings close together in clusters as far as possible.	Design team EO	Planning and Design	Specifications to be incorporated by Design Team and verified by ESCO / ECO prior to construction.
		Cables and pipelines should be located underground wherever possible.			
		Ensure uniformity in shape and colour of turbines.			
		If security lighting is required: – Use light fixtures that provide precisely directed illumination; – If possible, use lighting that is activated only on movement of illegal entry to the site; – Avoid high pole top security lighting if possible.			
		Wire-mesh or Clear-Vu type fencing should be used for perimeter fencing.			
		Signage related the project must be discreet and confined to the entrances.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
EMP74	Operational impacts on existing visual resources and potentially sensitive receptor locations in the surrounding area	Buildings on the substation sites should be painted with natural tones that fit with the surrounding environment.	Design team EO Contractor	Operation	No additional monitoring requirements
		Lighting fixtures should make use of minimum lumen or wattage.			
		Mounting heights of lighting fixtures should be limited, or alternatively, foot-light or bollard level lights should be used.			

8.14 HEALTH AND SAFETY

8.14.1 *OBJECTIVES*

- To ensure communication with members of the public to promote safety awareness;
- To prevent public access to construction sites and storage areas; and
- To ensure safety for all onsite personnel.

8.14.2 *INDICATOR AND COMPLIANCE MECHANISM / OUTCOMES*

The following indicator and compliance mechanisms are applicable:

- Induction training and records;
- Health, safety, environmental and community incident and complaints management system register;
- Monitoring and audit reports;
- Incident classification and reporting management procedure (to be developed);

- PPE register;
- Occupational health and safety plan (to be developed by the Contractor); and
- Health and safety protocol (to be developed by the Contractor).

8.14.3 *MITIGATION AND MANAGEMENT MEASURES*

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
EMP75	Health and Safety	All onsite personnel are required to undergo induction training and regular toolbox talks to raise awareness of the conditions contained herein.	SHE Officer Contractor	Construction Operation	No additional monitoring required.
EMP76		Safety conditions are to be monitored during construction. Continuous monitoring will be undertaken by the SHE Officer and will be audited monthly.	SHE Officer	Construction	
EMP77		Develop and implement an occupational health and safety plan.	SHE Officer	Construction Operation	
EMP78		The appointed contractor will be responsible for the development of a comprehensive health and safety protocol which must be adhered to.	Contractor	Construction	
EMP79		PPE must be supplied to all onsite personal and training (i.e. toolbox talks) on the correct use of PPE must be undertaken.	SHE Officer Contractor	Construction Operation	
EMP80		Train all onsite personnel handling chemical or hazardous substances in the use of such substances and the environmental, health and safety consequences of incidents.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
EMP81		Provide onsite personnel with sufficient potable water for drinking.			

8.15 SOCIO- ECONOMIC MANAGEMENT

8.15.1 *OBJECTIVES*

- To ensure that the negative socio-economic impacts are mitigated and managed; and
- To ensure that the positive economic impacts are enhanced.

8.15.2 *INDICATOR AND COMPLIANCE MECHANISM/ OUTCOMES*

The following general indicator and compliance mechanisms are applicable:

- Induction training and records;
- Health, safety, environmental and community incident and complaints management system register;
- Monitoring and audit reports;
- Incident classification and reporting management procedure (to be developed);
- PPE register;
- Occupational health and safety plan;
- Health and safety protocol;
- HIV/AIDS awareness and prevention program;
- Trafficking in persons awareness programme;
- Business and skills development plan (to be developed); and

- Grievance mechanism.

The following project specific indicator and compliance requirements are applicable:

- Local employment and business targets to be formalised in a document before the construction phase commences;
- Database of potential local service providers to be developed, before the construction phase commences;
- 40% of the construction labour and 60% during operation could be sourced locally;
- Record of engagement with the Laingsburg Local Municipality and community representatives in respect of employment opportunities and community upliftment projects;
- Engagement with the Laingsburg Local Municipality(LLM) and local enterprises in respect of accommodation of labour;
- Health and Safety Plan prepared and implemented during the construction phase;
- HIV/AIDS campaign implemented throughout the construction and operations phase;
- Evidence of workforce transportation home during and after construction phase;
- Number of complaints raised by stakeholders;
- Code of conduct for workers in place, signed, and implemented; and
- Retrenchments meet South African Labour legislation.

8.15.3 *MITIGATION AND MANAGEMENT*

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
SE1 **SE 3** **SE4**	Creation of Employment Opportunities	An accredited training and skills development programme aimed at maximising the opportunities for local workers to be employed in the low and semi-skilled positions should be initiated prior to the initiation of the construction phase.	Project Manager Contractor ESCO / ECO CLO	Construction Operational Decommissioning	No additional monitoring required
		The recruitment selection process for the training and skills development programme must seek to promote gender equality and the employment of women wherever possible.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
		Before the construction phase commences the proponent must meet with representatives from the KHLM and LLM to establish the existence of a skills database for the area.			
		Target of 50% low skilled and 30% semi-skilled of the construction labour should be sourced locally.			
		The local authorities and relevant community representatives must be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that the proponent intends following for the construction phase of the project.			
		Where reasonable and practical the proponent must appoint local contractors and implement a local's first policy, especially for semi and low-skilled job categories.			
		Where possible, the proponent must assist local BBBEE companies to complete and submit the required tender forms and associated information.			
SE2	Technical advice on wind energy to local farmers and municipalities	The applicant in consultation with the contractor should investigate the option of holding a workshop/s with local farmers and representatives from LLM to discuss options for installing small-scale wind energy facilities and the technology and costs involved.	Holder of the EA Contractor ESCO / ECO	Construction	
SE3		The proponent must establish a Monitoring Forum (MF) in order to monitor the construction phase and the implementation of the recommended mitigation measures. The MF must be established	Project Manager	Construction	

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
	Presence of construction workers on local communities	before the construction phase commences, and should include key stakeholders, including representatives from the LLM, farmers and the contractor(s). The MF should also be briefed on the potential risks to the local community and farm workers associated with construction workers.	Contractor ESCO / ECO CLO	Operational Decommissioning	
		A code of conduct for the construction phase must be developed, in consultation with the MF. The code must identify which types of behaviour and activities are not acceptable. Construction workers in breach of the code must be dismissed. All dismissals must comply with the South African labour legislation.			
		An HIV/AIDS awareness programme for all construction workers must be implemented at the outset of the construction phase.			
		Transport must be provided to and from the site on a daily basis for low and semi-skilled construction workers.			
		The necessary arrangements for the transport of workers from other local towns in the area, such as Worcester and Paarl, home over weekends must be done by the contractor. This will reduce the risk posed to local family structures and social networks in Laingsburg and Sutherland.			
		No construction workers, apart from security personnel, must be permitted to stay over-night on the site.			
SE4		The proponent must implement a policy that no employment will be available at the gate and or in Sutherland and Laingsburg.	Project Manager	Construction	

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
	Minimise disruption caused by influx of job seekers	A Grievance Mechanism in included in Section9.13 and should be implemented as part of the Stakeholder Engagement Plan.	EO ESCO / ECO Contractor CLO		
		Stakeholder engagement processes should be put in place to make sure that all interested and affected party have buy in in the process which will be designed and followed for employment and local procurement opportunities.			
		The proponent should implement a ―locals first policy, specifically with regards to unskilled and low skilled opportunities.			
		The contractor must provide transport to and from the site on a daily basis for low and semi-skilled construction workers to effectively manage and monitor the movement of construction workers on and off the site.			
		Where feasible, the contractors must make the necessary arrangements to transport workers from other local towns in the area, such as Worcester and Paarl, home over weekends. This will reduce the risk posed to local family structures and social networks in Laingsburg and Sutherland.			
SE5	Increased risks to livestock and farming infrastructure associated with the construction related	The applicant must enter into an agreement with the landowners on whose property the WEF is located, whereby damages to farm property etc. during the construction phase that are proven to be associated with the construction activities for the WEF will be compensated for.	Project Manager EO ESCO / ECO	Construction Decommissioning	

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
	activities and presence of construction workers on the site	Early, clear, and effective communication with affected and adjacent landowners prior to and throughout the construction phase is critical. A detailed Stakeholder Engagement Plan should be developed prior to the implementation of the construction phase and should be developed in conjunction with the affected landowners and key stakeholders, such as local landowners, the local farming association and municipality.	Contractor CLO		
		The movement of construction workers on the site should be confined to regulated areas.			
		All landowners on and in the immediate vicinity of the site must be contacted to discuss timing of construction related activities in the vicinity for his cropping areas.			
		The relevant owners must be consulted prior to the commencement of the construction phase to identify the location of the irrigation infrastructure so as to ensure that it is not damaged during the construction phase.			
		A Monitoring Committee (MC) should be established as part of the Stakeholder Engagement Plan. The MC should be made up of representatives from the affected landowners and key stakeholders, such as the local farmers, the local farming association, municipality and proponent.			
		Procedures and timeframes should be identified for reporting and addressing incidents, such as damage to gates and fences etc. Based on the comments from the affected land owners, it would appear that the role played by the ESCO / ECO involved in the existing projects can be improved. The ESCO / ECO and CLP			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
		should liaise closely with each other throughout the construction phase.			
		A Community Liaison Person (CLP) should be appointed by the proponent at the outset of the construction phase. Ideally this person should be from the local community and his or her role should be to ensure that the Stakeholder Engagement Plan is implemented on the ground. The CLP should be involved in the development of the Stakeholder Engagement Plan and not merely appointed to implement the Plan. In this way he or she will have met with and engaged with the affected landowners and key stakeholders prior to the start of the construction phase and will have a good understanding of farming activities in the area and how these may be impacted by the construction related activities.			
		The approach to responding to and addressing complaints or concerns should be sympathetic, open, transparent, and constructive. This would go a long way in maintaining good relations. In this regard the Stakeholder Engagement Plan should be informed by a set of engagement principles that support this approach.			
		Contractor training must include making workers aware of the consequences of their actions and the impact that they may have on farming activities. A Contractor Training programme should be developed and implemented prior to the commencement of the construction phase. The programme should inform contract workers of the requirements of the Stakeholder Engagement Plan and Environmental Management Plan and their roles and responsibilities in terms of these plans.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
SE6	Minimise risk of grass fires	The conditions of the Code of Conduct must make clear that in the event of a fire proven to be caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor should also compensate the firefighting costs borne by farmers and local authorities.	EO ESCO / ECO Contractor CLO	Construction Decommissioning	
SE7	Noise, dust, waste and safety impacts associated with construction related activities and vehicles	As far as possible, the transport of components to the site along the N1, R354 and R356, must be planned to avoid weekends and holiday periods.			
		Dust suppression measures must be implemented for heavy vehicles using appropriate dust suppression methods on gravel roads on a regular basis, adhering to speed limits and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers.			
		Steps must be taken to minimise the potential impact of dust generated by construction vehicles on the vegetable seed cropping operations on Fortuin.			
		All workers should receive training/ briefing on the reasons for and importance of closing farm gates and driving slowly.			
		Damage caused by construction related traffic to local farm roads must be repaired on a regular basis throughout the construction phase.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
		All vehicles must be road-worthy, and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits.			
		Workers are to be informed that no waste can be thrown out of the windows while being transported to and from the site. Workers who throw waste out windows should be fined.			
		Waste generated during the construction phase must be transported to the local landfill site if it cannot be reused or recycled.			
SE8	Grazing and productive farmland	All areas disturbed by construction related activities, such as access roads on the site, construction platforms, workshop area etc., must be rehabilitated at the end of the construction phase. The rehabilitation plan should be informed by input from a botanist with experience in arid regions.	ESCO / ECO Contractor Project Manager	Construction	
		All workers must receive training/ briefing on the reasons for and importance of not driving in undesignated areas.			
SE10 **SE13**	Creation of employment and business opportunities	The proponent must implement a training and skills development programme for locals during the first 5 years of the operational phase. The aim of the programme should be to maximise the number of South African‘s and locals employed during the operational phase of the project.	Holder of the EA	Operational	
		The proponent, in consultation with the LLM, must investigate the options for the establishment of a Community Development Trust.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
SE11	Generation of income for farmers	The final placement of wind turbines associated with the Rietkloof WEF must be discussed with the affected landowners,	Holder of the EA	Operational	
SE12	Benefits associated with the establishment of a community trust	The LLM must be consulted as to the structure and identification of potential trustees to sit on the Trust. The key departments in the LLM that must be consulted include the Municipal Managers Office, IDP Manager and LED Manager.	Holder of the EA	Operational	
		Clear criteria for identifying and funding community projects and initiatives in the area must be identified. The criteria must be aimed at maximising the benefits for the community as a whole and not individuals within the community.			
		Strict financial management controls, including annual audits, must be instituted to manage the funds generated for the Community Trust from the WEF.			
SE16	Impacts associated with decommissioning activities	The applicant must ensure that all retrenchments conform with South African Labour Law legislation, including provision of retrenchment packages where applicable, when the WEF is decommissioned.	Contractor	Decommissioning	
		All structures and infrastructure associated with the proposed facility that can no longer be used by farmers or Eskom/ other IPPs must be dismantled and transported off-site on decommissioning.			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
		Investigate the option of establishing an Environmental Rehabilitation fund to cover the costs of decommissioning and rehabilitation of disturbed areas. The fund should be funded by a percentage of the revenue generated from the sale of energy to the national grid over the 20-year Operational life of the facility. The rationale for the establishment of a Rehabilitation Trust Fund is linked to the experiences with the mining sector in South Africa and failure of many mining companies to allocate sufficient funds during the operational phase to cover the costs of rehabilitation and closure. Alternatively, the funds from the sale of the WEF as scrap metal should be allocated to the rehabilitation of the site.			

8.16 TRAFFIC MANAGEMENT

8.16.1 *OBJECTIVES*

To ensure that the traffic impacts of the project are mitigated and managed.

8.16.2 *INDICATOR AND COMPLINACE MECHANISMS/ OUTCOMES*

The following indicator and compliance mechanisms are applicable:

- Induction training and records;
- Health, safety, environmental and community incident and complaints management system register;
- Monitoring and audit reports;
- Incident classification and reporting management procedure (to be developed);

- PPE register;
- Occupational health and safety plan;
- Health and safety protocol; and
- Traffic and transportation management plan (**Appendix C**).

8.16.3 *MITIGTION AND MANAGEMENT MEASURES*

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
EMP82	Traffic Management	A Traffic Management Plan has been prepared to enable the identification and implementation of all legal and best practice requirements in respect of the management of traffic associated with the construction and operation of the facility. The Traffic Management Plan should be updated prior to the commencement of the construction phase, when detailed information regarding the delivery of components, traffic data and construction activities are available. This Plan must be implemented and reviewed every four months or immediately after an incident, when corrective measures will be incorporated into the Plan.	Project Manager Contractor ESCO / ECO	Prior to Construction Construction Decommissioning	No additional monitoring required.
		The delivery of components to the site can be staggered and trips can be scheduled to occur outside of peak traffic periods.			
		It is recommended that the respective haulage company conducts a dry-run to determine the restrictions relevant to the haulage vehicle to be utilised. With some route's road signs may need to be moved, overhead cables may need to be raised and bellmouths may need temporary widening to accommodate abnormal loads. A dry-run will help establish relevant changes specific to the abnormal load truck used to deliver the components and materials.			
		All bellmouths along the chosen site accesses to the wind turbine locations need to be in line with the required geometric standards to accommodate abnormal			

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
		haulage vehicles. The exact location and upgrades of the internal access roads will need to be established at detailed design stage.			
		The posted speed limit on the R354 in the vicinity of the proposed development is currently 120km/h. It is suggested that the speed limit should be reduced to 60km/h in advance of the site access roads			
EMP83		Intersection warning signs must be erected either side of the access roads in accordance with the requirements of the South African Road Traffic Signs Manual and it is recommended that supplementary warning plates be added to these warning signs indicating the presence of heavy vehicles at the intersection. The aforementioned road signs are shown below: 			
EMP84		The additional loading due to the project is not very high but is likely to accelerate the deterioration of the existing surfacing.			Monitor intersections and roads for deterioration and repair as necessary
EMP85		The transport route/s of the construction materials, components and any oversized/weight components may be National, Provincial or Local roads; and approval will have to be obtained from each authority for the transportation of any oversized or abnormally heavy components.			No additional monitoring required.

REF	IMPACT / ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	ADDITIONAL MONITORING REQUIREMENTS
EMP86		Construction vehicles should only use the roads during daylight hours. No construction vehicles should be operational from 6pm to 6am			
EMP87		All heavy vehicles should ensure that their headlights are on to increase their visibility to other vehicles and pedestrians			
EMP88		All drivers should comply with the relevant traffic laws and regulations			

9 MANAGEMENT PLANS

The DFFE requires that the EMPr amendment includes the following management plans, as indicated in the EA conditions:

- A Conservation Management Plan (Section 8.6.4)[13];
- An Alien Invasive Management Plan (Section 9.1);
- A Plant Rescue and Protection Plan (Section 9.2);
- A Re-Vegetation and Habitat Rehabilitation Plan (Section 9.3);
- A Traffic Management Plan (**Appendix C**);
- A Construction and Operational Avifauna (**Appendix D**);
- A Bat Monitoring Plan (**Appendix E**);
- A Heritage Conservation Management Plan (**Appendix F**);
- A Stormwater Management Plan (Section 9.5);
- An Erosion Management Plan (Section 9.6);
- A Rehabilitation Management Plan (Section 9.3);
- A Fire Management Plan (Section 9.7);
- Measures to Protect Hydrological Features (Section 9.8);
- A Health and Safety Program (Section 9.9);
- Hazardous Substances Leakage or Spillage Monitoring System (9.10); and
- A Waste Management Plan (9.11).

The following additional management plans have also been compiled:

- Emergency Response Plan (Section 9.12);
- Grievance Mechanism (Section 9.13);
- HIV/AIDS Management Plan (Section 9.14);
- Chance Find Procedure (Section 9.15);
- Security Policy (Section 9.16); and
- COIVD-19 (Section 9.17).

9.1 ALIEN INVASIVE MANAGEMENT PLAN[14]

The DFFE manages Invasive Alien Species under the National Environmental Management: Biodiversity Act 10 of 2004 (NEMBA). In addition, there are regulations published in the Government Gazette on 1 August 2014, which stipulate categories for the classification of invasive potential (and thus risk), of the different known problem species in the country. These classes loosely model that of Henderson (2001), which provides the invasive status classification, as outlined in the Conservation of Agricultural Resources Act (No. 43 of 1983a). These plants can be classified as Category 1, 2 or 3 species, and as a 'Declared Weed' or 'Declared Invader' according to their level of invasiveness in South Africa. The description of the abovementioned classifications are as follows:

- **Category 1a:** invasive species that may not be owned, imported into South Africa, grown, moved, sold, given as a gift or dumped in a waterway. Category 1a species include, for example, the yellow water lily (*Nuphar*

[13] It must be noted that the Part 2 Amendment Application recently submitted for the Rietkloof WEF (Ref: 14/12/16/3/3/1/1977/AM1) requests the removal of this requirement from the EA and subsequently the EMPr.

[14] Adapted from the EOH Environmental Management Programme for the proposed Rietkloof WEF, Dated 20 September 2016

lutea), yellow flag (*Iris pseudocorus*), bur cactus (*Opuntia salmiana*), hop wattle (*Acacia stricta*) and kangaroo wattle (*Acacia paradoxa*).

- **Category 1b:** Invasive species that may not be owned, imported into South Africa, grown, moved, sold, given as a gift or dumped in a waterway.
- **Category 2** plants: (Commercially used plants) may be grown in demarcated areas providing that there is a permit and that steps are taken to prevent their spread
- **Category 3** plants: (Ornamentally used plants) may no longer be planted; existing plants may remain, as long as all reasonable steps are taken to prevent the spreading there of, except within the floodline of watercourses and wetlands
- **Declared weed** (category 1): Prohibited on any land or water surface in South Africa, must be controlled, or eradicated where possible (except in biological control reserves)
- **Declared invader** (category 2): Allowed only in demarcated areas under controlled conditions, import of propagative material and trading allowed only by permit holders, Outside demarcated areas must be controlled, or eradicated where possible (except in biological reserves), Prohibited within 30 m of the 1:50 year floodline of watercourses or wetlands unless authorization obtained.
- **Declared invader (category 3):** No further plantings allowed (except with special permission)**,** No trade of propagative material**,** Existing plants may remain but must be prevented from spreading**,** prohibited within 30m or the 1:50 year floodline of watercourses or wetlands, or as directed by the executive officer.

Invasive alien species pose the second largest threat to biodiversity after direct habitat destruction. The purpose of this Plan is to provide a framework for the management of alien and invasive plant species during the construction and operation of the project, which in turn serves to manage open spaces, as required. The broad objectives of the plan include the following:

- Ensure alien plants do not become dominant in parts or the whole site through the control and management of alien and invasive species presence, dispersal and encroachment.
- Managing and maintaining the ecosystem in a near-natural state and restoring and/or rehabilitating the ecosystems to such a state.
- Develop and implement a monitoring and eradication programme for alien and invasive species.
- Promote the natural re-establishment and planting of indigenous species in order to retard erosion and alien plant invasion.

It is essential that alien invasive species be removed from the study area. Following the Working for Water guidelines for effective alien vegetation removal (DWAF, 2009), an alien removal programme should consist of the following three phases:

1. Initial control: Clearing and eradication of alien invasive stands so as to drastically reduce the existing population;
2. Follow-up control: Control of re-growth (including seedlings, root suckers and coppice growth); which should be conducted annually for the first 5 years.
3. Maintenance control: Sustain alien plant numbers with on-going annual monitoring for the life of the project, and if necessary implement additional control methods to avoid re-establishment of alien invasive stands.

9.1.1 *POTENTIAL ALIEN INVASIVE PLANT SPECIES AT THE SITE*

A few alien plant species are known to occur within the broader area, which may require management. These species are indicated in **Table 9-1** below, with their common names and their risk classification.

Table 9-1: List of alien invasive species recorded at the site

SPECIES NAME	COMMON NAME	CLASSIFICATION*
Prosopis spp.	Mesquite	1b species in Western Cape,
Bromus spp.	Cheat grass / ripgut	Naturalised invader, not listed
Lolium spp.	Perennial rye grass	Naturalised invader, not listed

SPECIES NAME	COMMON NAME	CLASSIFICATION*
Avena fatua	Wild Oat	Naturalised invader, not listed
Salsola kali	Tumbleweed	1b
Dittrichia graveolens	Stinkwort	Naturalised invader, not listed
Amsinckia retrorsa	Rigid fiddleneck	Naturalised invader, not listed
Conyza bonariensis	Hairy Fleabane / Horseweed	Naturalised invader, not listed

9.1.2 GENERAL REQUIREMENTS

- Cuttings must be immediately removed from site and disposed of at a suitable disposal facility.
- For these species, follow up clearing must be conducted every two months to remove upcoming seedlings. This is the Holder of the EA's responsibility.
- In cases where large scale alien plant removal has been conducted, measures to stabilise the soil from wind and water erosion must be taken. Soils may be mulched and planted with indigenous pioneer species.
- Continued ESCO/ECO monitoring throughout the life of the project will be required as the risk of alien plant species invasion is never eliminated.

9.1.3 WEED REMOVAL PROGRAMME

There are several possible methods which can be used to control alien invasive species; these include mechanical, chemical and biological control. The sections below outline possible techniques used in mechanical and chemical control methods. **Table 9-2** (below) outlines specific management details for each of the alien invasive species identified on site.

As the species identified in the ecological report for this region include mainly grasses and herbs, mechanical clearing methods are limited in efficacy. Cut stump and frill treatments are also traditionally reserved for woody plant species, and as such are not applicable in the treatment of species found in this instance.

According to Todd (2011)[15], mowing, fire, herbicide application and grazing are the four general categories of grass control in South Africa. Fire and mowing are difficult practically for control, as it means that natural vegetation will suffer if not applied correctly. Often, circumstances do not allow for successful physical control of the region, and the only available option is herbicide application. Due to the good condition of the study area, with mainly natural vegetation of similar height to that of the invasive grasses (i.e. roughly knee height), mowing and fire are not practical options. Especially in the light of fire tolerance and fire adapted grass species, such as *Avena* spp., for which fire may increase the reproductive potential of the species. It is for this reason that chemical control is the primary suggested control method for invasive alien species in the study area. Fire and mowing are not discussed, as they are not regarded feasible for the existing land use and for the effective control of the herbs.

9.1.4 MECHANICAL CONTROL METHODS

Mechanical methods for alien plant removal may include felling, removing or burning invading alien plants. The following mechanical methods for felling are recommended:

- Hand pulling: Grip the young plant low down and pull out by hand (using gloves).
- Ring barking: Bark is removed to from the bottom of the stem to a height of 0.75-1.0 m to below ground level. Bush knives or hatchets can be used for debarking.

[15] Todd, S.(2011). Options for Invasive Grass management in the Nieuwoudtville Wildflower Reserve

- Frill or Ring-bark: Using an axe or bush knife, angled cuts are made downward into the cambium layer through the bark in a ring; herbicide is applied into the cuts.
- Cut stump treatment: Stems should be cut as low as practical as stipulated on the herbicide label. Chemical herbicides are applied in diesel or water as recommended. Applications in diesel should be to the whole stump and exposed roots and in water to the cut area as recommended on the label.

9.1.5 CHEMICAL CONTROL PROCESS

Chemical methods for alien plant removal include using a number of approved environmentally safe herbicides, which are applied to the leaves, stems or stumps of alien invader species (details of herbicides suitable for the various species are provided in **Table 9-2**. All alien control measures to be approved by the ESCO / ECO prior to undertaking it.

Table 9-2: Summary of potential methods to be used for removal of alien invasive species identified on site.

SPECIES NAME	HAND PULL OR HOE*	HERBICIDE
Prosopis spp.	Seedlings and saplings	The chemical and mechanical control of Mesquite has been found to be unfeasible financially, as control costs outweigh property values (Zachariades, Hoffman & Roberts 2011). As such, biological control is suggested, under supervision of the Agricultural Research Council (ARC), employing approved insects. Should smaller populations occur on site, mechanical clearing of new growth, coupled with regular herbicidal treatment should continue until populations are at maintenance levels. Cut stump treatment with Picloram has been shown to be effective in SMALL populations in the past. – Basal Bark/Cut Stump Treatment – The basal bark application of usually 'Garlon 600' mixed in diesel onto the bark from ground level to knee height all the way around the Stem, during the active growing season. Cut stump treatments on any size plant at any time of the year using similar herbicides are also useful. – Foliar (Overall) Spray Treatment – Foliar sprays are best applied on dense thickets of seedlings less than 1.5 metres tall. The plants must be actively growing with a large area of foliage. A wetting agent must be added to the mix. Garlon, Grazon DS and Access are all herbicides that can be used.
Bromus spp.	Seedlings or entire plant	According to CABI (2016), a range of herbicide treatments has been successfully used for control of *B. diandrus* in South Africa: In cereals, pre-emergence applications of cyanazine + terbuthylazine, chlorsulfuron + terbuthylazine, and metribuzin (Dastgeib et al., 2003) or post-emergence applications of clethodim, haloxyfop (Nott, 2002); or sulfosulfuron (Agenbag and Crous, 1999). In legumes, post-emergence treatments fluazifop, quizalofop (le Roux et al., 1995) and simazine + paraquat (Leys and Plater, 1993).

SPECIES NAME	HAND PULL OR HOE*	HERBICIDE
Lolium spp.	Seedlings or entire plant	Foliar application during the active growing season of tepraloxydim (cyclohexanone) 50 g / L (Aramo® herbicide).
Avena fatua	Seedlings or entire plant	Pre-emergent soil application of Pyroxasulfone (Pyrazole) 850 g/kg (Sakura® herbicide). Care must be taken to not spray soil outside of the edges of current infestations, and to reduce spray drift and unintended exposure to other plants.
Salsola kali	Seedlings or entire plant	Nicosulfuron (sulfonyl urea) 750 g/kg (Accent®) as foliar spray, post-emergence. Contains 720 g / ℓ dimethenamid-P (Frontier® Optima) for pre-emergence application. Care must be taken to not spray soil outside of the edges of current infestations, and to reduce spray drift and unintended exposure to other plants.
Dittrichia graveolens	Seedlings or entire plant	The salt formulation of triclopyr (Garlon 3A®) in a post-emergence, foliar spray application while plants are still young. Waxes on mature leaves create uptake problems, and as such earlier control efforts will be more effective. For Stinkwort, this is generally just before or at the time of bolting. Triclopyr is selective and relatively safe on grasses and may be also be used. Glyphosate (Roundup Pro) may also be used.
Amsinckia retrorsa	Seedlings or entire plant	Glyphosate (Round-Up Biactive®, Weedmaster Duo® (360 g/L); Metsulfuron-methyl (Brush-Off®, Associate ® (600 g/Kg)) or Metsulfuron-methyl + glyphosate (Trounce®, Cut-Out® (various formulations), applied during the active growing season. Different application rates are suggested for different size target plant. Further reading available at http://dpipwe.tas.gov.au/invasive-species-site/Pages/Amsinckia---Herbicides-for-Control.aspx
Conyza bonariensis	Entire plant	MCPA® and Sorgomil Gold 600®, or paraquat and glyphosate based products (though resistance has been shown). Treat plants using foliar spray soon after bolting.

*Avoid mechanically clearing during dry periods or when plants are desiccated, in particular tumbleweed. This is primarily due to the seed dispersal mechanisms for most grasses and tumbleweed being through desiccation and wind-blow dispersal. Control should be focussed on new growth using chemical means, as more uptake will occur, and greater absorption will lead to greater efficacy.

9.1.6 *MONITORING*

Due to their persistent nature and prodigious seeding and reproduction, invasive alien plants require coordinated, consistent monitoring and control efforts. For this project, where invasive species are likely to mainly be located along already disturbed regions such as farmsteads, roads, cattle feedstock's, pens, and farm dams, the monitoring efforts should be focussed on these areas. This is especially important as the majority of the project region is currently under good, natural veld with little invasion. Monitoring should be conducted by the ESCO / ECO (contractually), and EO (incidentally, or on an ad-hoc basis).

The EO shall survey all high priority regions (disturbed areas) every two weeks throughout the construction phase and include in his/her monthly report finding from these surveys. The objective will be to identity the presence of absence of target species on-site, and to identify the efficacy and ongoing clearance control offered by the methods mentioned above. New occurrences of problem species must be noted for clearance and included in the clearing teams' objective for clearing to commence within two weeks of positive identification.

During the operation phase, monitoring may be relaxed to a once every six months event, where surveys for all disturbed regions (i.e. all regions cleared and frequented by the construction efforts) is to be conducted. Findings shall be captured yearly and included in the rehabilitation reporting. Reports should be made available upon request.

9.1.7 *GENERAL CONTROL EFFORTS*

In general, control efforts must:

- Avoid fire as a clearing / control method;
- Avoid mowing as a clearing / control method;
- All biocontrol measures must be conducted in consultation with the Plant Protection Research Institute (DoA – Pretoria), or another recognised IAP control organisation, in order to ensure the correct agent is being employed, and the region isn't at risk.
- A clearing roster must be drawn up by the ESCO and approved by the Project Manager prior to clearing commencing, to allow for a work schedule for all invasive species occurrences on-site. This roster will be updated as clearing occurs, and new instances are observed. This roster will be used to track progress and act as proof of clearing conducted and can be verified by the ESCO / ECO;
- All clearance activities to be described in a Method Statement for approval by the ESCO / ECO;
- Prioritise small populations over large populations;
- Prioritise less dense infestations to denser infestations;
- Ensure clearing of fringes of existing populations prior to the clearing of the centre (i.e. outside inward, not inwards to the outside clearing);
- Ensure all control teams are equipped with the appropriate Protective wear and do not conduct work without them on;
- Apply herbicide to plants at new growth, as opposed to mature plants (this improves uptake);
- Ensure the correct herbicide is selected for each species, and the correct dosage is used. Dosage must at all times follow that of the label;
- Ensure the correct clearing method is selected and used for each species;
- Clearing must be conducted every three months for herbaceous species, and once every six months for Mesquite. Once maintenance levels have been achieved, clearance may occur annually or as required for the duration of the operation phase; and
- Should these clearing methods above prove ineffectual, a professional clearing organisation or botanist (Working for Water, or the City of Cape Town invasive Species Unit or similar) must be approached for a species-specific management plan, to be followed for each species.

9.2 PLANT RESCUE AND PROTECTION PLAN

The purpose of the plant rescue and protection plan is to implement avoidance and mitigation measures, in addition to the mitigation measures included in the EMPr to reduce the impact of the development of the project on listed and protected plant species and their habitats, and to provide guidance on search and rescue of species of conservation concern.

9.2.1 *RELEVANT ASPECTS OF THE SITE*

Brunsvigia josephinae which is listed as Vulnerable, is widespread across the project area, from lower lying areas to mid-slope and occasionally on lower mountain tops. It is also found sporadically along riverbanks of watercourses with one notable sub-population found on an upper order tributary of the Groot River. Several small to large sized population of a few hectares was noted to be present in the broader area within or near project component footprints. This species will require relocation where affected by project components, but due to the extensive coverage in the wider project area, it is not anticipated that the project specific impact will be significant to the species as a whole.

Several other species of conservation concern were found to be present, as small scattered and localised populations or very few individuals to single individual occasionally noted within the areas surveyed. These include *Indigofera hantamensis*, *Antimima androsacea*, *Euryops sulcatus*, *Antimima loganii*, *Geissorhiza karooica*, *Lotononis venosa*, *Romulea eburnea*, *Romulea hallii*, *Romulea syringodeoflora* and *Romulea tortuosa*.

Mitigation and management measures include, but are not limited to the following:

- Vegetation clearing should only commence after a walk down has been conducted by a suitably qualified person and the necessary permits obtained.
- A flora and fauna search and rescue (relocation) must be undertaken before commencement of vegetation clearing and should preferable be undertaken in the Spring season. A comprehensive list of species for which permits will be required, is provided in Appendix 1: Plant Species of Conservation Concern (Red listed) and Appendix 2: Flora Protected in Terms of Provincial Acts and Ordinance(s) of the Ecology & Biodiversity Walkdown Report. Permits for the identified species would be required either in terms of the respective Provincial legislation and/or under the NEMBA Threatened of Protected Species (ToPS).
- The relevant permits will be applied for prior to undertaking any activities that could impact on Threatened and Protected Species.

Additional mitigation measures listed in this EMPr with the objection of protecting vegetation, are repeated below:

- Vegetation clearing to be kept to a minimum. No unnecessary vegetation to be cleared;
- Vegetation removal must be limited to the construction site and should be removed only as it becomes necessary rather than removing all the vegetation throughout the site at once;
- Materials should not be delivered to the site prematurely which could result in additional areas being cleared or affected;
- No vegetation to be used for firewood;
- Gathering of firewood, fruit, medicinal plants, or any other natural material onsite or in areas adjacent to the site is prohibited unless with prior approval of the ESCO / ECO;
- Construction site office and laydown areas must be clearly demarcated, and no encroachment must occur beyond demarcated areas;
- All natural areas impacted during construction must be rehabilitated with locally indigenous plant species;
- A buffer zone should be established in areas where construction will not take place to ensure that construction activities do not extend into these areas;
- The use of pesticides and herbicides in the study area must be discouraged as these impacts on important pollinator species of indigenous vegetation; and
- Soil stockpiles must not become contaminated with oil, diesel, petrol, garbage or any other material, which may inhibit the later growth of vegetation in the soil. Spillage can result in a loss of soil functionality thus limiting the re-establishment of flora.

9.3 RE-VEGETATION AND HABITAT REHABILITATION PLAN

The purpose of the rehabilitation plan is to ensure that areas cleared or impacted during construction activities are rehabilitated with a plant cover that reduces the risk or erosion from these areas as well as restores some ecosystem function. The purpose of the rehabilitation plan for the site can be summarised as follows:

- Achieve long-term stabilisation of all disturbed areas to minimise erosion potential;
- Re-vegetate all disturbed areas with suitable local plant species;
- Minimise visual impact of disturbed areas; and
- Ensure that disturbed areas are safe for future uses.

Mitigation and management measures include, but are not limited to the following:

- Re-vegetation should aim to accelerate the natural succession processes so that the plant community develops in the desired way, i.e. promote rapid vegetation establishment;
- Re-vegetation of disturbed surfaces should occur immediately after construction activities are completed. This should be done through seeding with locally indigenous species typical of the representative botanical unit;
- Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to construction;
- Seeds from surrounding seed banks can be used for re-seeding;
- Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas;
- Planting of indigenous tree species in areas not to be cultivated or built on must be encouraged;
- Habitat destruction should be limited to what is absolutely necessary for the construction of the infrastructure, including the construction of new roads. In this respect, the recommendations from the Ecological Specialist Study should be applied strictly. Personnel should be adequately briefed on the need to restrict habitat destruction, and must be restricted to the actual construction area; and
- Monitoring programme to ensure that rehabilitation efforts are successful to ensure that risks such as erosion, spread of exotic species and the edge effect are avoided.

9.4 OPEN SPACE MANAGEMENT PLAN

A detailed open space management plan must be developed prior to the commencement of construction. The key open space management measures include, but are not limited to the following:

- A buffer zone should be established in areas where construction will not take place to ensure that construction activities do not extend into these areas;
- Vehicle movement should be restricted to authorised access roads;
- Before construction begins, all areas to be developed must be clearly demarcated;
- All construction camps are to be fenced off in such a manner that unlawful entry is prevented, and access is controlled;
- Signage shall be erected at all access points in compliance with all applicable occupational health and safety requirements. All access points to the construction camp should be controlled by a guard or otherwise monitored, to prevent unlawful access;
- The contractor and ESCO / ECO must ensure compliance with conditions described in the EA;
- Records of compliance/ non-compliance with the conditions of the authorisation must be kept and be available on request;
- Records of all environmental incidents must be maintained, and a copy of these records be made available to provincial department on request throughout the project execution;
- All construction equipment must be stored within the construction camp;
- An area for the storage of hazardous materials must be established that conforms to the relevant safety requirements and that provides for spillage prevention and containment;
- The Contractor must provide sufficient ablution facilities, in the form of portable / VIP toilets, at the construction camps, and shall conform to all relevant health and safety standards and codes. Enough toilets shall be provided to accommodate the number of personnel working in the area;
- No fires will be allowed apart from fires in designated areas;

- The Contractor shall take specific measures to prevent the spread of veld fires, caused by activities at the campsites. These measures may include appropriate instruction of employees about fire risks and the construction of firebreaks around the site perimeter;
- Environmental awareness training for construction staff, concerning the prevention of accidental spillage of hazardous chemicals and oil; pollution of water resources (both surface and groundwater), air pollution and litter control and identification of archaeological artefacts; and
- Staff should be educated as to the need to refrain from indiscriminate waste disposal and/or pollution of local soil and water resources and receive the necessary safety training.

9.5 STORMWATER MANAGEMENT PLAN[16]

Storm water includes any surface run-off and flows resulting from precipitation, drainage or other sources. A Storm Water Management Plan (SWMP) is implemented during the construction and operation of a facility and it ensures compliance with applicable regulations and prevent off site migration of contaminated storm water or increased soil erosion. The SWMP to be developed will include the construction of design measures that allow surface and subsurface movement of water along drainage lines so as not to impede natural surface and subsurface flows. In addition, drainage measures will be designed to promote the dissipation of storm water run-off and appropriate erosion mitigation must form part of this plan to prevent and reduce the risk of any potential erosion.

The purpose of this chapter is to provide a concept plan for the stormwater management measures that will be adopted during the construction and operation of the Rietkloof WEF. The plan will ensure that the storm water is channeled in a controlled manner from the existing and new infrastructure such as roads, turbine platforms and the electrical substation towards the natural drainage lines, to avoid water logging, pollution or erosion.

The SWMP should consist of the following:

- Adoption of gravel roads and not asphalt roads to guarantee natural drainage trough the gravel;
- Adoption of proper drainages along the gravel roads of the steepest portions of the wind farm to channel storm water away, as shown in the following typical drainage works;
- Design an appropriate site preparation of the substation area with adequate slopes and side water outlets to disperse storm water which can runoff from the asphalt paved areas; and
- Adopt a storm water abatement system around the electrical substation, where the storm water may get in contact with debris or oil traces. This is done as an environmental precaution, as the risk of storm water pollution is negligible. The transformer is in fact equipped with double seal oil containment and the paved surface which can be driven by vehicles will be kept to minimum. Depending on Eskom's standard design protocol, the storm water drained from the substation could be collected in a decantation basin and is the purified by possible traces of oil prior to being reintroduced into the environment.

The engineering of the drainage works will be done during the project planning phase as described in **Section 3.3**. The present report will identify conceptual arrangements that will be used as the base of the detailed engineering. Precaution measures will be adopted during the detailed layout definition to avoid soil erosion, these may include, *inter alia*:

- Avoid alteration of the existing natural drainage lines during construction phase as far as feasibly possible, by adopting a buffer from both sides of each natural drainage line to avoid construction works close to the drainages; and
- Use of existing crossings for cables lay down.

[16] Adapted from the EOH Environmental Management Programme for the proposed Rietkloof WEF, Dated 20 September 2016

9.5.1 MANAGEMENT MEASURES

Typically, storm water run-off contains suspended sediments, metals, petroleum hydrocarbons, Polycyclic Aromatic Hydrocarbons (PAHs), coliform, etc (**Table 9-3**). To reduce the need for storm water treatment, the following should be applied:

- Storm water should be separated from process and sanitary wastewater streams to reduce the volume of wastewater to be treated prior to discharge;
- Surface run-off from process areas or potential sources of contamination should be prevented;
- Where this approach is not practical, run-off from process and storage areas should be segregated from potentially less contaminated run-off;
- Run-off from areas without potential sources of contamination should be minimised (e.g. by minimising the area of impermeable surfaces) and the peak discharge rate should be reduced (e.g. by using vegetated swales and retention ponds);
- Priority should be given, where feasible, to managing and treating the first flush of storm water run-off where the majority of potential contaminants tend to be present;
- When water quality criteria allow, storm water should be managed as a resource, either for groundwater recharge or for meeting water needs at the facility;
- Oil-water separators and grease traps should be installed and maintained as appropriate at refueling facilities, workshops, parking areas, fuel storage and containment areas; and
- Sludge from drains or treatment systems may contain elevated levels of pollutants and should be disposed of in compliance with local regulatory requirements.

Table 9-3: Major sources of common storm water pollutants.

COMMON CONSTITUENTS	MAJOR SOURCES RELATED TO URBAN LAND USE
Sediment and Particulates	Construction, winter road sanding, vehicle emissions, pavement wear
Hydrocarbons (PAH's)	Spills, leaks, dumping, vehicle emissions, asphalt breakdown, wood preservatives
Pathogens (Bacteria, Viruses)	Illicit connection of septic systems to storm sewers, poor housekeeping (animal faeces, bird faeces from rooftops)
Nutrients (N, P)	Illicit connection of septic systems to storm sewers, detergents (car washing), lawn fertilizers
Cadmium	Tire wear, insecticides, wood preservatives
Zinc	Galvanized building materials, tire wear, motor oil, grease
Lead	Motor oil, lubricants, batteries, bearing wear, paint, vehicle exhaust
Copper	Wear of moving engine parts, metal plating, fungicides and insecticides
Manganese	Wear of moving engine parts
Nickel	Vehicle exhaust, lubricants, metal plating, wear of moving parts
Chromium	Metal plating, wear of moving parts
Iron	Steel structures, rusting automobile bodies
PCBs	Leaks from electrical transformers, spraying of highway right of ways, catalyst in tire construction

9.5.2 DESIGN SPECIFICATION FOR STORMWATER MANAGEMENT

Storm water will naturally drain through the gravel access roads. In addition, in the steepest areas' roads should be equipped with side drainages and culverts in order to channel the storm water in a controlled manner to the

nearest natural drainage line. The outlets and the culverts should be planned and designed in such a way that water will not gather velocity and cause erosion.

Considering the locations of the turbines and the dimension of the foundation footprint, foundations will not require permanent drainages as such only temporary drainage works allowing water runoff during construction will be required. Typical examples of the side outlets and of the drainage works (culverts) are provided **Figure 9-1** and **Figure 9-2** below.

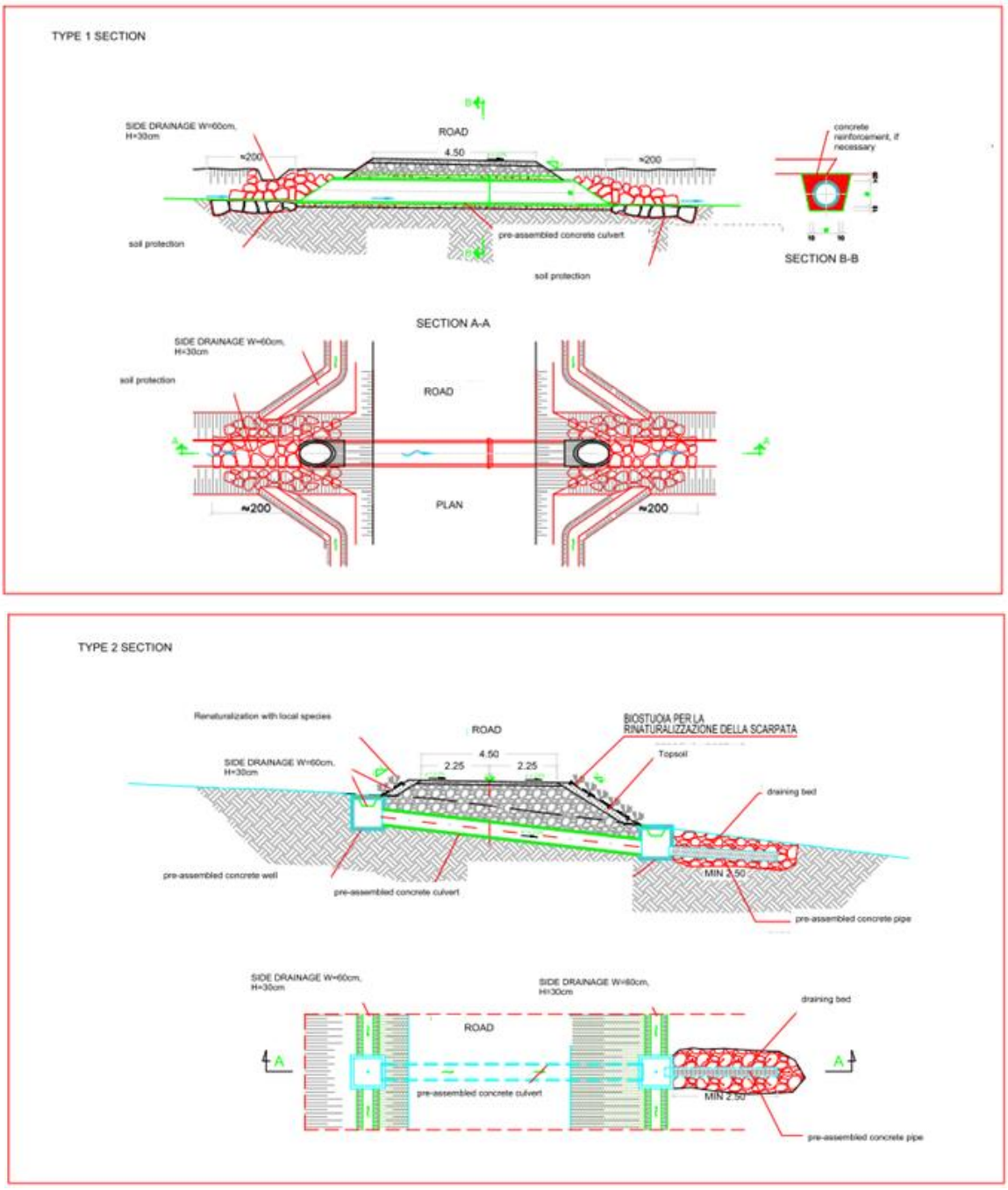


Figure 9-1: Typical drainage works for gravel roads

Water Collection Works

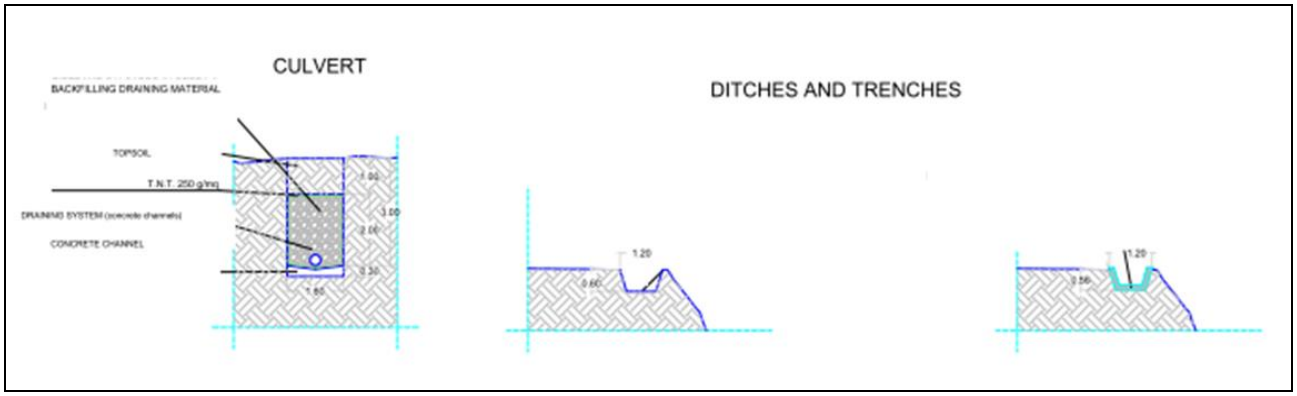


Figure 9-2: Typical culverts and trenches conveying the storm water to the drainage

An appropriate site preparation of the substation area with adequate slopes and side water outlets to disperse storm water will be designed, as per **Figure 9-3**. The storm water abatement system will be provided, consisting in:

- A drainage sump where the water is collected by gravity and receives a first separation;
- A disoleatore where the water is separated from oil and debris through decantation and separation; and
- Final filter before discharge into the nearest natural drainage line.

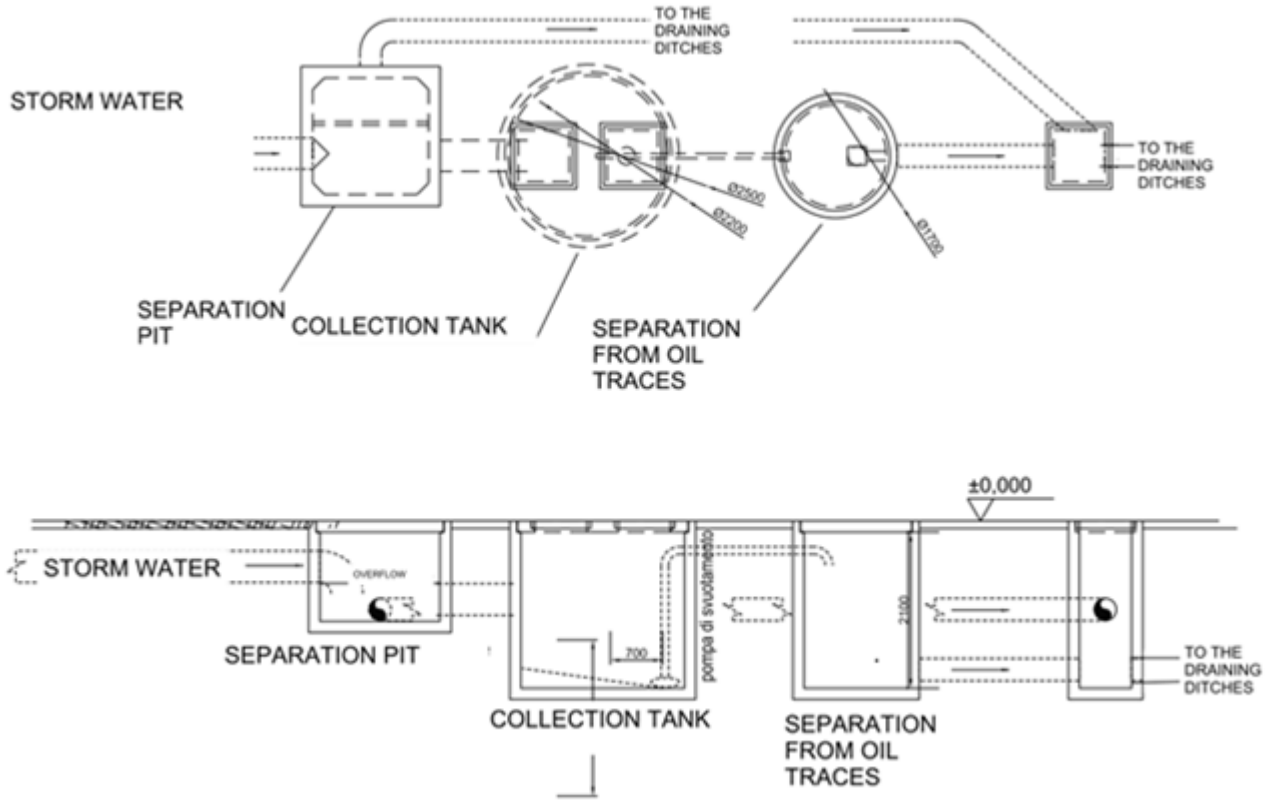


Figure 9-3: Contaminated storm water abatement system

The oil-filled electrical transformer will be equipped by an oil containment basin (normally a concrete basin) so that, in case of a spill, the oil remains contained within the spill containment area without contamination of the ground. This eliminates the likelihood of storm water contamination from hydrocarbon spills from electrical transformers.

9.6 EROSION MANAGEMENT PLAN[17]

Exposed and unprotected soils are the main cause of erosion in most situations. The Erosion Management Plan addresses the management and mitigation of potential impacts relating to soil erosion. The objective of the plan is to provide:

- A general framework for soil erosion and sediment control, which enables the contractor to identify areas where erosion can occur and is likely to be accelerated by construction-related activities; and
- An outline of general methods to monitor, manage and rehabilitate erosion prone areas, ensuring that all erosion resulting from all phases of the development is addressed.

9.6.1 *EROSION AND SEDIMENT CONTROL PRINCIPLES*

The goal of erosion control during and after construction within the study area should be to:

- Protect the land surface from erosion;
- Intercept and safely direct run-off water from undisturbed upslope areas through the study area without allowing it to cause erosion within the site or become contaminated with sediment;
- Progressively re-vegetate or stabilise disturbed areas.

These goals can be achieved by applying the management practices outlined in the following sections.

9.6.2 *GENERAL EROSION CONTROL*

The Contractor should take all reasonable measures to prevent soil erosion resulting from the construction activities as well as to prevent the restriction or increase in the flow of storm water caused by the presence of temporary / permanent works. Erosion prevention measures must be implemented to the satisfaction of the Engineer and the ESCO / ECO. Areas affected by construction related activities must be monitored regularly for evidence of erosion. Areas particularly susceptible to erosion include areas stripped of topsoil and soil stockpiles and steep slopes (gradients > 6 %). Where evidence of erosion appears, the construction of contour berms, cut-off drains or planting of grass sods may be necessary. Where soil erosion does occur, the Contractor shall reinstate such areas and areas damaged by the erosion, at his own cost and to the satisfaction of the Engineer and ESCO / ECO.

9.6.3 *PREVENTATIVE MEASURES*

The following prevention measures are recommended:

- The Contractor is to provide a method statement on erosion control showing clearly how cleared surfaces and stormwater will be managed on site during construction and rehabilitation;
- Wind screening and stormwater control will be undertaken to prevent soil loss from the study site;
- All erosion control mechanisms will be regularly maintained;
- Re-vegetation of disturbed surfaces will occur immediately after the construction activities are completed;
- In the case of existing surface wash-away and wind erosion, the Contractor shall implement remedial measures as soon as possible to prevent further erosion;
- During construction, the Contractor shall protect areas susceptible to erosion by installing necessary temporary and permanent drainage works as soon as possible and by taking other measures necessary to prevent the surface water from being concentrated in streams and from scouring the slopes, banks or other areas; and

[17] Adapted from the EOH Environmental Management Programme for the proposed Rietkloof WEF, Dated 20 September 2016

- Traffic and movement over stabilised areas is to be restricted and controlled, and damage to stabilised areas shall be repaired and maintained to the satisfaction of the ESCO / ECO.

9.6.4 *EROSION AND SEDIMENT CONTROL MEASURES*

The following precautionary measures must be implemented onsite to manage erosion and sediment control:

- Re-vegetate areas that have been disturbed as soon as possible;
- Cut and fill slopes must be made stable and be re-vegetated as soon as possible during the construction phase;
- Newly formed terraces within the facility must be vegetated to stabilise the soil;
- Where erosion and/or sedimentation, whether on or off the site, occurs despite the Contractor complying with the foregoing, rectification shall be carried out in accordance with details specified by the ESCO / ECO;
- Where erosion and/or sedimentation occur due to the fault of the Contractor, rectification shall be carried out to the reasonable requirements of the ESCO / ECO and at the expense of the Contractor;
- If the Site is closed for a period exceeding 5 days, the Contractor, in consultation with the ESCO / ECO, shall carry out the following checklist procedure:
    - Excavated and filled slopes and stockpiles are at a stable angle and capable of accommodating normal expected water flows; and
    - Re-vegetated areas have a watering schedule and the supply to such areas is secured.

9.7 A FIRE MANAGEMENT PLAN[18]

- The Contractor shall take all the necessary precautions to ensure that fires are not started as a consequence of his activities on site.
- The Contractor, sub-contractors and all employees are expected to be conscious of fire risks. The Contractor shall hold fire prevention talks with staff to create an awareness of the risks of fire. Regular reminders to his staff on this issue are required.
- A fire officer is to be appointed by the contractor to ensure immediate and appropriate actions in the event of a fire and shall ensure that employees are aware of the procedures to be followed;
- The Contractor shall forward the name of the Fire Officer to the ESCO / ECO for his approval within 7 days of being on site;
- A fire break shall be constructed around the footprint area prior to construction. The firebreak must be maintained in consultation with the Fire Chief;
- "No-smoking" signs to be placed in areas used for storage of oil and fuel;
- All construction camps shall be provided with portable fire extinguishing equipment, in accordance with all relevant legislation and must be readily accessible;
- Fire extinguishers to be serviced by an accredited service provider on an annual basis;
- The Contractor shall ensure that there is basic firefighting equipment available on site at all times. This shall include at least rubber beaters when working in urban open spaces and natural areas, and at least one fire extinguisher of the appropriate type when welding or other "hot" activities are undertaken;
- The Contractor shall take specific measures to prevent the spread of veld fires, caused by activities at the campsites. These measures must include appropriate instruction of employees about fire risks and designated smoking areas;
- Smoking must only be permitted in designated smoking areas. Fire extinguishers will be available in these areas at all times;
- Prevention of runaway fires by keeping vegetation short in working areas;

[18] Adapted from the EOH Environmental Management Programme for the proposed Rietkloof WEF, Dated 20 September 2016

- Fire prevention facilities must be present at all storage facilities. No open fires shall be allowed on site under any circumstance. No cooking on open fires shall be done onsite to prevent runaway fires;
- Emergency numbers for local police and fire department etc. must be placed in a prominent area;
- All fires must be prohibited on site and only designated cooking areas will be allowed where fire-fighting equipment is available;
- Any fires that occur shall be reported to the ESCO / ECO immediately who will then liaise with the local Fire Protection Agency;
- The Contractor shall appoint a Fire Officer who shall be responsible for ensuring immediate and appropriate actions in the event of a fire and shall ensure that employees are aware of the procedures to be followed;
- The Contractor shall forward the name of the Fire Officer to the ESCO / ECO for his approval within 7 days of being on site;
- The Contractor shall be liable for any expenses incurred by any organisations called to assist with fighting fires that were started as a result of his activities or personnel, and for any cost relating to the rehabilitation of burnt areas, or consequential damages.

9.8 PROTECTION OF HYDROLOGICAL FEATURES AND SENSITIVE AREAS

The following measures will be used to protect hydrological features (streams, rivers, pans, wetlands, dams and catchment) and other environmentally sensitive areas from impacts associated with construction. These measures must be read in conjunction with those contained in Section 8 as they relate to surface water management.

- Implement measures to prevent groundwater and surface water contamination as a result of construction activities and potential spill of hazardous substances;
- Ensure that as far as possible all infrastructure is placed outside of water resource and their associated buffers;
- The watercourses 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 watercourses (except on approved road crossings);
- Contractor laydown areas, and material storage facilities to remain outside of the 100 m/500 m GN509 Zone of Regulation (ZoR);
- No vegetation may be removed from the 100 m/500 m GN509 ZoR surrounding the watercourse where no infrastructure is planned, as this provides a natural buffer zone around the watercourses which disperse surface runoff into the watercourses, and thus prevents sedimentation and erosion thereof;
- Ensure effective waste management in order to prevent construction waste from polluting hydrological environments;
- It must be ensured that all hazardous storage containers and storage areas comply with the relevant SABS standards to prevent leakage.

9.9 HEALTH AND SAFETY PROGRAMME

This section provides measures for a conceptual health and safety to manage potential hazards associated with the site activities, and avoid and/or prevent accidents from the construction activities and operations on site. A detailed health and safety programme to be developed by the Contractors in consultation with the relevant safety, Health and Environmental (SHE) Oficer/s. The programme will be developed prior to the commencement of construction works and must be fully conversant with all relevant environmental and health and safety legislation applicable to the project.

The following measures are suggested for consideration in the compilation of the health and safety programme/plan:

- The Contractor/s must develop a health and safety plan prior to commencement of construction, and this plan must adhere to the prescriptions of the relevant health and safety legislation and standards;

- The Contractor/s must familiarise himself and his employees with the contents of the plan;
- Contractors must comply with the relevant statutory requirements, including the Occupational Health and Safety Act (OHSAct), Act 85 of 1993;
- Potentially hazardous areas must be clearly demarcated on site;
- A comprehensive first aid kit must be available on site at all times;
- Appropriate Personal Protective Equipment (PPE) must be worn by construction personnel on site. This includes the wearing of safety helmets, safety boots, safety glasses, hearing protection, safety reflective jackets, dust masks etc;
- PPE signs must be erected on site at the areas where it is required, and personnel not wearing the appropriate PPE required in the relevant areas must bot be allowed access to those areas;
- Adequate and mandatory safety precautions relating to all aspects of construction must be implemented by the Contractor/s on site. All personnel must be trained regarding basic site safety procedures;
- Safety measures must be communicated to all personnel on site;
- Regular maintenance of turbines and all other infrastructure must be undertaken to ensure optimal functioning and reducing the potential of hazards and safety issues. This includes regular inspections of all infrastructure associated with the turbines.

9.10 HAZARDOUS SUBSTANCES LEAKAGE OR SPILLAGE MONITORING PLAN[19]

The special mitigation measures pertaining to the hazardous substance bunding and monitoring have been included in the construction and operation measures, contained in **Section 8** of this report. However, in general, the contractor shall be responsible for the implementation of hazardous substance management measures, as detailed below. The Project Manager shall ensure effective and accurate implementation of hazardous substance management, the ESCO / ECO shall ensure compliance monitoring with below specifications and reporting thereon. The timeframe shall be the duration of the construction phase.

9.10.1 *TRAINING*

Ensure that all personnel that use or handle hazardous material are trained:

- In the use and potential dangers of the materials;
- To understand what a Materials Safety Data Sheet (MSDS) is, and be able to interpret the information thereon;
- On emergency response procedures required to counter the nature and hazards of an accidental release; and
- The handling and storage practices, for all containers with which they will come into contact.

9.10.2 *MATERIAL TYPES*

The types of materials that are utilised during construction should comply with the following:

- Use materials with low life cycle impact;
- Use materials with low embodied energy (i.e. materials that require less total energy to extract, manufacture, transport, construct, maintain and dispose of);
- Reduce materials containing volatile organic compounds and formaldehyde;
- Avoid xylene and toluene solvents in paints, glues and carpets as well as polyurethane;
- Where possible use water-based paint; and

[19] Adapted from the EOH Environmental Management Programme for the proposed Rietkloof WEF, Dated 20 September 2016

- Do not use chlorofluorocarbons (CFCs), polychlorinated biphenyl (PCBs), persistent organic pollutants (POPs) (in pesticides), ozone depleting substances (ODSs) and materials containing asbestos.

9.10.3 CONTROL PLANNING FOR HAZARDOUS MATERIALS ON SITE

The following controls need to be in place for all hazardous materials being handled and stored onsite:

- Document the types and quantities of hazardous materials present on the proposed project site, including the following information:
  - Name and description (e.g. composition of a mixture) of the hazardous material;
  - Classification (e.g. code, class or division) of the hazardous material;
  - Regulatory reporting threshold quantity of the hazardous material;
  - Quantity of hazardous material used per month;
  - Characteristic(s) that make(s) the hazardous material hazardous (e.g. flammability, toxicity, etc.);
  - Analysis of potential spill and release scenarios using available industry statistics on spills and accidents where available;
  - Analysis of the potential for uncontrolled reactions such as fire and explosions; and
  - Analysis of potential consequences based on the physical geographical characteristics of the site, including aspects such as its distance to settlements, water resources, and other environmentally sensitive areas.
- Identify locations of hazardous materials and associated activities on an emergency plan site map;
- Detail the availability of specific personal protective equipment and training needed to respond to an emergency; and
- Detail availability of spill response equipment, sufficient to handle at least initial stages of a spill and a list of external resources for equipment and personnel, if necessary, to supplement internal resources.

9.10.4 UNCONTROLLED RELEASES

The following measures must be implemented onsite to prevent and/or manage uncontrolled realises:

- Prevent uncontrolled releases of hazardous material to the environment or uncontrolled reactions that might result in fire or explosion using engineering controls (containment, automatic alarms, and shut-off systems) commensurate with the nature of the hazard;
- Implement management controls (procedures, inspections, communications, training, and drills) to address residual risks that have not been prevented and controlled through engineering measures;
- Store all hazardous (reactive, flammable, corrosive and toxic) materials in clearly identified, fit-for-purpose containers or vessels;
- Clean any accidental spills immediately and treat the spilled material and use cleaning products as hazardous waste.;
- Describe response activities in the event of a spill, release, or other chemical emergency in an incident report that must include, inter alia:
  - Internal and external notification procedures;
  - Specific responsibilities of individuals or groups;
  - Decision process for assessing severity of the release, and determining appropriate actions;
  - Facility evacuation routes; and
  - Post-event activities such as clean-up and disposal, incident investigation, employee re-entry, and restoration of spill response equipment.

9.10.5 *REACTION, FIRE AND EXPLOSION PREVENTION*

Reactive, flammable, and explosive materials must be managed to avoid uncontrolled reactions or conditions resulting in fire or explosion. Such prevention practices include:

- Storage of incompatible materials (acids, bases, flammables, oxidizers, reactive chemicals) in separate areas, and with containment facilities separating material storage areas;
- Provision of material-specific storage for extremely hazardous or reactive materials;
- Use of flame arresting devices on vents from flammable storage containers; and
- Storage of hazardous materials in an area of the facility separated from the main construction activities.

9.10.6 *PLANNIG COORDINATION*

Procedures should be prepared for:

- Informing the public and emergency response agencies;
- Documenting first aid and emergency medical treatment;
- Taking emergency response actions;
- Reviewing and updating the emergency response plan to reflect changes and ensuring that the employees are informed of such changes; and
- Using, inspecting, resting and maintaining the emergency response equipment.

9.10.7 *STORAGE OF HAZARDOUS MATERIALS*

Storage of all hazardous materials must be undertaken in accordance with the following:

- Locate chemicals stored in drums in areas with a secondary containment capacity of at least 10% more than the maximum stored quantity of chemicals;
- Drum stack heights must not exceed two drum heights on pallets. All defective pallets must be replaced immediately. A minimum space of 80 cm must be left open between stacks and 100 cm between stacks and a wall;
- Chemical products must be secured when not needed to prevent tampering and vandalism;
- Provide warning notices, fire-fighting facilities and protection from weather damage;
- Keep products in their original containers unless they are not re-sealable, with all stored products and containers being labelled, and original labels and MSDS retained;
- Store acetylene, propane, and oxygen cylinders in dedicated areas where they will be protected from collision or ignition sources;
- Label containers so that the hazard nature of the material is clear;
- Ensure compliance with all national, regional and local legislation regarding the storage, transport and use of hydrocarbons, chemicals, solvents, explosives and any other harmful and hazardous substances and materials;
- The Contractor must provide proof to the Project Manager that, if required, the relevant authorisation to store such substances has been obtained from the relevant authority. In addition, hazard signs indicating the nature of the stored materials must be clearly displayed on the storage facility or containment structure;
- Petrochemicals, oils and identified hazardous substances must only be stored under controlled conditions. All hazardous materials (e.g. bitumen binders) must be stored in a secured, appointed area that is fenced and has restricted entry. Storage of bituminous products must only be in suitable containers approved by the Project Manager;
- Keep a record of all hazardous substances stored on site for submission to the ESO and for verification to the ESCO / ECO; and
- Store all hazardous substances in secure, safe and weatherproof facilities, underlain by a bunded concrete slab to protect against soil and water pollution.

9.10.8 *HANDLING OF HAZARDOUS MATERIALS*

Hazardous materials must be handled in accordance with the following:

- Ensure that personnel who handle hazardous substances have been educated and trained in terms of the correct handling, use and disposal thereof;
- Empty containers in which hazardous substances were kept are to be treated as hazardous waste. Such containers must not be reused for any purpose;
- Obtain Material Safety Data Sheets (MSDS) for all hazardous chemical formulations before use and all materials must be handled according to the instructions;
- In response to and in addition to the information contained on the MSDS the following must also be determined:
    - What personal protective equipment (PPE) is required;
    - What emergency actions may be needed (i.e. first aid, firefighting media, etc.);
    - The weight of the container so that proper personnel and/or equipment will be utilised during handling;
    - Access and egress routes; and
    - Containers holding flammable materials to be grounded during transfers of contents.

9.10.9 *TRANSPORT OF HAZARDOUS MATERIAL*

The transport of hazardous materials to and from site must be undertaken in accordance with:

- Provide for controlled loading/unloading areas, underlain by an impervious paving or PVC sheet to protect against soil and water pollution;
- All hazardous waste containers designated for off-site transport to be secured and labelled with the contents and associated hazards, be properly loaded and be accompanied by a shipping paper (i.e. manifest) describing the loads and its associated hazards; and
- Transporters of hazardous materials must ensure that:
    - The vehicle is suitable and registered for the purpose it is being used; and
    - The vehicle displays clear markings in English indicating the nature of the materials being carried, what to do in the event of an emergency, and an emergency telephone number (24 hour) of a responsible person who can provide advice in the event of an emergency.

9.10.10 *FLAMMABLE LIQUIDS*

The storage and handling of chemical liquids must be undertaken in accordance with the following:

- No combustible material (e.g. wood, rags, paper, carton boxes) are to be kept in the presence of flammable liquids;
- ‘No Open Flames’ and ‘No Smoking’ symbolic signs are to be displayed in the vicinity of the flammable liquid storage areas. Flammable liquids are to be issued only on a need-to-use basis and strict control is to be exercised to ensure that persons do not draw more than what is needed for the specific job;
- An adequate number and type of fire-fighting equipment is to be available in the close vicinity of the flammable liquid store;
- Flammable liquid stores are to be equipped with approved flameproof electrical equipment;
- Flammable liquid containers in the flammable liquid stores are to be clearly marked/labelled as to their contents. They are to be provided with earthed drip trays;
- Locations are to display MSDS information and handling/storage instructions. MSDSs are to be available for all flammable/hazardous products at the location where such substances are present;

- The number of 200 litre drums containing flammable liquids is to be kept to a minimum and the position is to be strictly controlled. The necessary signs should be visible at these storage areas;
- Flammable liquid tanks are to be properly earthed to prevent static electricity accumulating;
- Drainage points on flammable liquid tanks are to be provided with threaded caps or blanking plates;
- Bund walls are to surround storage tanks containing flammable liquids and these must be able to contain the entire volume of the contents plus 10% in case of spillage; and
- Adequate precautions must be taken, such as wearing relevant protective equipment when handling substances.

9.11 WASTE MANAGEMENT PLAN

The development of a Waste Management Plan (WMP) for the proposed Brandvalley WEF is required to promote sustainable waste management during the life cycle of the project. The objective of the plan is to ensure that effective methods are implemented with regards to storage, handling, transportation and disposal of waste generated as a result of the project.

The Project Manager shall ensure effective implementation of the WMP, in conjunction with the measures indicated in Chapter 7 of this EMPr, However, a detailed waste management method statement must be developed by the Contractor prior to commencement of construction.

9.11.1 *WASTE HIERARCHY*

A waste is any solid, liquid or contained gaseous material that is being discarded by, disposal, recycling, burning or incineration. Waste management options for a particular waste need to be considered according to the Waste Management Hierarchy (**Figure 9-4**) which reflects the relative sustainability of each of the options. One of the key principles underlying the waste management hierarchy is to ensure that waste is dealt with as high up the waste hierarchy as possible. Since all waste disposal options have some impact on the environment, the only way to avoid impact is not to produce waste in the first place, and waste reduction is therefore at the top of the hierarchy. Re-use, followed by recovery techniques (recycling, composting and generating energy from waste) follow, while disposal to landfill or by incineration (the worst options) are at the bottom of the hierarchy.

In deciding on the most appropriate disposal route, both environmental and economic costs and benefits need to be considered. This decision must be reached taking into account all the costs and impacts associated with waste disposal, including those associated with the movement of waste.

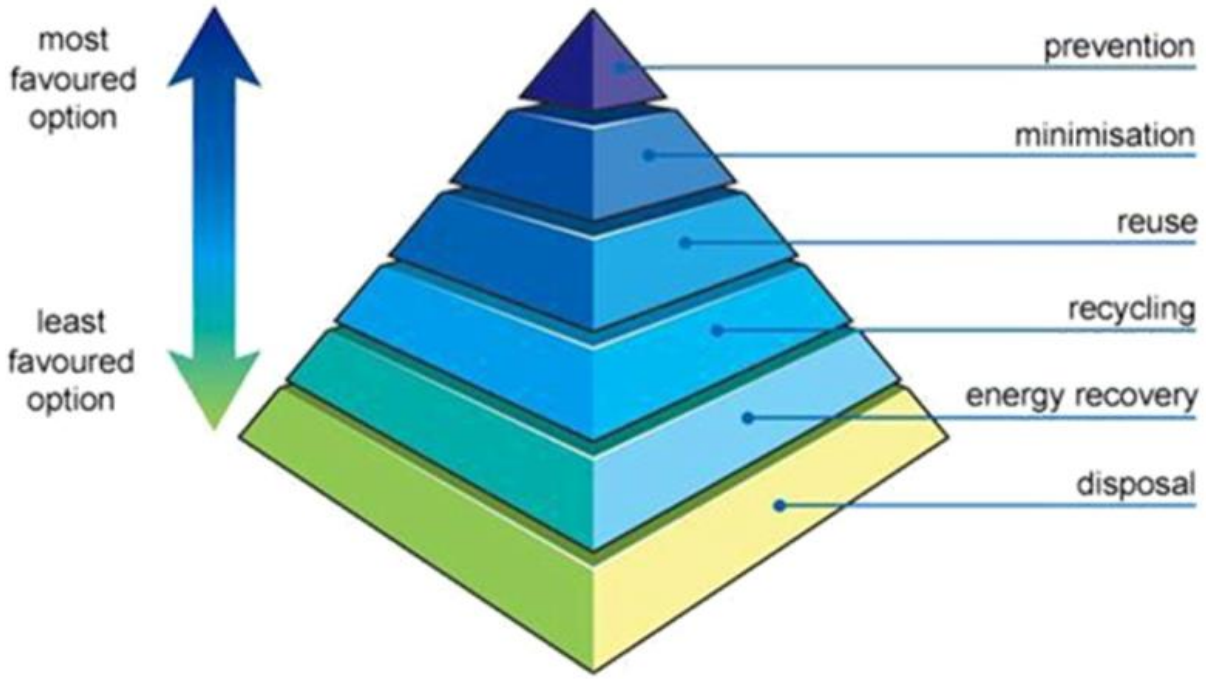


Figure 9-4: Waste Hierarchy

9.11.2 *PROJECT STAGES*

The purpose of this section is to assess the construction, operational processes of the proposed Rietkloof WEF in order to identify short comings, like raw materials procurement, infrastructure, employee training, health and safety, transportation, storage, compliance with legislative requirements, emergency preparedness and waste streams arising from an operation and its related activities, as well as the current waste management practices per waste stream. The assessment serves as the baseline against which any problem areas or gaps in waste management practises, process technology and environmental authorisations are identified and against which future performance objectives, activities and targets can be set.

The project stages are described below with the waste generation and management methods described in the corresponding tables below them including:

- Details on how waste will be managed during the construction and operational phases taking into consideration the waste management hierarchy;
- Details of the procedure for the separation of non-recyclable and recyclable waste;
- Details of the management of non-recyclable waste i.e. how waste will be stored on site during construction and operational phases, including the frequency for the removal of waste from the site and an indication of the landfill site where it will be disposed;
- Details for the management of recyclable waste e.g. the type of waste materials that will be recycled on site and the details pertaining to the offloading, sorting, handling, storage and collection procedures for the waste types (e.g. compaction and bailing, breaking of glass etc.); and
- The frequency for the removal of waste from the proposed development to where it will be finally managed must be included.

Waste Management at the project site will be undertaken in line with the EMPr to consider the correct disposal of general and hazardous waste generated on the project. **Table 9-4** describes the different waste products that the proposed project will produce, as well as the various options to dispose of them. Waste will mainly be generated during the construction phase. During operation, contractors are only on the site for limited amount of time as and when maintenance is required.

Table 9-4: Waste Management Options

WASTE	TYPE OF WASTE	MANAGEMENT OPTIONS
Hydrocarbons (Contaminated soil)	Hazardous	Fuel and oil spillages can be a source of contamination of water sources and the soil. Management options include: — Using spill kits to clean any spillages; — Ensure storage facilities are maintained and meet industry regulations; — Transportation and storage of fuel must be regulated and correctly managed according to the EMPr; — Waste generated along servitude to be taken to the contractor laydown area at the end of each day; — Co-ordinate waste removal with the removal of waste from the contractor laydown area; and — All hazardous waste is to be disposed of at a registered hazardous landfill (safe disposal certificates must be obtained).
Contaminated Personal Protective Equipment (PPE)	Hazardous	PPE can be contaminated during handling of hydrocarbons. Management options include: — Store contaminated PPE in hazardous waste skips along the servitude; — Waste generated along servitude to be taken to the contractor laydown area at the end of each day; — Co-ordinate waste removal with the removal of waste from the contractor laydown area ; and — Ensure contaminated PPE is disposed of at a registered hazardous landfill (safe disposal certificates must be obtained).
General waste	General	General waste (inorganic matter) can be disposed of as per normal and form part of the municipal waste management system. Management options include: — Ensure waste is stored securely in refuse bins; — Waste generated along servitude to be taken to the contractor laydown area at the end of each day; and — Co-ordinate waste removal with the general removal of waste from the contractor laydown area .
Food waste	General	Food waste is generated as site personnel take their meals on the construction site. Management options include: — Store any waste and packaging into a labelled food waste bin; — Waste generated along servitude to be taken to the contractor laydown area at the end of each day; — Co-ordinate waste removal with the removal of waste from the contractor laydown area; and — Co-ordinate waste removal with the general removal of waste.

9.11.3 *TRAINING*

Ensure that all personnel are provided training and awareness regarding waste management. The training should, as a minimum, include the following:

— The importance of hazardous waste minimisation, management and disposal;
— Prohibit the mixing of general waste with hazardous waste;

- Prohibit littering, and the significant environmental impacts, actual or potential, as a result of littering and improper storage and/or disposal of waste; and
- Cleaning of areas where hazardous waste spills have occurred and dispose of the hazardous material appropriately. Key personnel must be trained on handling spillages.

9.11.4 *WASTE STORAGE*

- The EO and Project Manager must ensure that all Contractors have a detailed waste management method for the storage and handling of all wastes specific to their activities.
- A dedicated waste management team must be appointed to ensure effective waste management on site.
- Designated waste areas must be established on site for the storage of all waste streams prior to be collected for disposal by the relevant waste contractors. This area must be suitable and pose potential for environmental contamination/pollution (located away from water resources).
- An adequate number of labelled or colour coded waste bins must be placed at the construction site areas during construction activities in order to minimise littering. The bins must be removed from the site on a regular basis for disposal at a registered or licensed disposal facility.
- Prohibit the mixing of general waste with hazardous waste. Should general waste be mixed with hazardous waste, it should be considered hazardous waste.
- Hazardous waste must be stored in covered waste receptacles located in bunded hard surfaced areas as per the requirements outlined in relevant legislation.
- Frequent monitoring and maintenance of septic tanks and portable toilets must be undertaken by the respective construction contractors and appointed contractor respectively.
- Waste recycling must be encouraged, and separate waste receptacles for recyclable material must be provided.
- Prohibit littering and burning of waste onsite.
- Storage of waste on site must be undertaken in line with applicable Regulations and best practice guidelines.

9.11.5 *WASTE DISPOSAL*

- All waste collection and disposal must be undertaken by a licenced/registered waste contractor, and information pertaining to the licensing of the contractor must be provided to the waste management team.
- The waste contractor must provide information on the recycling and disposal site, and issue applicable waste manifests for waste collection for disposal. All waste must be disposed of at a licenced facility.
- Retain records such as waybills and waste manifests associated with waste removal, transportation and disposal (safe disposal certificates).

9.12 EMERGENCY RESPONSE PLAN

The Holder of the EA will provide appropriate resources to respond to process upset, accidental, and emergency situations for operations and activities during construction, operation and decommissioning phases. The procedures will include plans for addressing training, resources, responsibilities, communication and all other aspects required to effectively respond to emergencies associated with their respective hazards.

All operations/ activities associated with the project will require site-specific emergency response plans to mitigate impacts, which meet or exceed all applicable regulations.

The objectives of this plan are as follows:

- Protect the communities and the environment through the development of emergency response strategies and capabilities;
- Set out the framework for hazard identification to define procedures for response to the situations including the development of contingency measures;

- Structure a process for rapid and efficient response to and manage emergency situations during the construction, operational and decommissioning phases of the project; and
- Assign responsibilities for responding to emergency situations.

The Emergency Response Plan must take the incident procedures referred to in Section 30 of the NEMA into account.

9.12.1 *ROLES AND RESPONSIBILITY*

With respect to this plan, the Holder of the EA has the responsibility to:

- Provide emergency response services and to structure and coordinate emergency response procedures for the project;
- Ensure that specific emergency responsibilities allocated to them are organised and undertaken; and
- Ensure that employees and contractor third parties are trained and aware of all required emergency procedures.

9.12.2 *EMERGENCY COMMUNICATIONS AND COORDINATION PLAN*

In an emergency where there is an immediate threat to communities, personnel or the environment, the Project Manager will be notified immediately. The Project Manager will dispatch the Emergency Response Coordinator who will determine the appropriate plan of action depending on the severity of the emergency, the people affected, and the need to evacuate.

If there is a developing emergency or unusual situation, where an emergency is not imminent, but could occur if no action is taken, the Project Manager (or if the Project Manager is absent the Environmental Manager) is to be informed immediately. Once the emergency or unusual situation has been managed, the correct incident/near miss must be reported to the General Manager.

If an emergency poses a direct threat to communities in the area, the Environmental Officer and/or Social Officer will advise persons in the vicinity of the emergency to evacuate due to the potential risk. The appropriate government authorities will immediately be notified of such an emergency evacuation. The Emergency Response Coordinator will be tasked with responding to the potential risk. Should the emergency be such that it can be managed by the Holder of the EA, equipment and personnel will be deployed to the maximum extent necessary, so as to prevent/minimise potential risks.

9.12.3 *RESPONSE TO INCIDETS*

An incident is any occurrence that has caused, or has the potential to cause, an unexpected negative impact on people, the environment or property (or a combination thereof). It also includes any significant departure from standard operating procedures. The reporting and investigation of all potential and actual incidents that could have a detrimental impact on human health, the natural environment or property is required so that remedial and preventive steps can be taken to reduce the potential or actual impacts because of all such incidents.

Any incident must immediately be reported to the relevant authorities and all the necessary documentation must be completed and submitted to the relevant authorities within the prescribed timeframes.

The actions resulting from any formal or informal investigations will be used to update the EMPr.

9.12.4 *VERIFICATION*

An environmental emergency response system will be developed for the execution of emergency drills that will include the following, inter alia:

- Fire Drills;
- Emergency Evacuation Drills; and
- Medical and Environmental Drills.

Reporting and monitoring requirements for the plan will include:

- Monthly inspections and audits;
- Quarterly reporting of accidents/ incidents;
- Reporting at the time of the incident and monthly spill reporting developed by the Environmental and Quality, Health and Safety departments;
- Bi-annual emergency response drills; and
- Annual reporting on training.

Emergency response drills and reporting will be maintained by the Project Manager and will provide information regarding required revisions to training or the emergency response actions. Each incident reported will be reviewed and investigated upon occurring. Actions will be identified where possible to improve the site's overall response to emergencies. Updates/revisions that are necessary to protect worker or community health and safety will be implemented immediately after approval by the General Manager. On a bi-annual basis, Key Performance Indicators (KPIs) will be compared against past-performance and analysed for trends to determine if there are areas for improvement. Changes because of the trend analysis and identified areas for improvement will be implemented following the project's change management system as required.

This plan will be amended periodically considering operational changes, learning experienced during its implementation and other activities that can affect the risk profiles.

9.13 GRIEVANCE MECHANISM

9.13.1 *GRIEVANCE MECHANISM - EXTERNAL*

A grievance mechanism is a tool used to address affected communities' concerns and complaints and is an important pillar of the stakeholder engagement process, since it creates opportunities for companies and communities to identify problems and discover solutions together. The Project proponent can benefit from understanding community concerns and complaints and addressing them through all stages of project development.

Where it is anticipated that a new project will involve ongoing risk and adverse impacts on surrounding communities, the project proponent is required to establish a grievance mechanism to receive and facilitate resolution of the affected communities' concerns and complaints about the proponent's environmental and social performance. The grievance mechanism should be scaled to risks and adverse impacts of the project, address concerns promptly, use an understandable and transparent process that is culturally appropriate and readily accessible to all segments of the affected communities, and do so at no cost to communities and without retribution. The mechanism should not impede access to judicial and administrative remedies.

The grievance mechanism described in this section includes both complaints and grievances (hereinafter referred to only as 'grievances') raised by stakeholders.

PURPOSE

The grievance mechanism describes the way the Proponent and community can work together to find solutions to grievances.

OBJECTIVES

The objectives of the grievance mechanism include:

- To be respectful of complainant culture, values, traditions and views;
- To resolve grievances at the local level and in a timely manner;
- To identify the root causes of grievances and address systemic issues;
- To provide a process that is dialogue based, with the complainant and the Proponent cooperating in the investigation, discussion, resolution and announcement of the grievance and result;

- To ensure fair, equitable and consistent outcomes to resolve grievances;
- To enhance and continuously improve the ability of the Proponent to fairly address community concerns.

SCOPE AND RESPOSIBLE PARTIES

A grievance mechanism is primarily for the community to raise relevant concerns about the Project / Proponent's activities and is to be implemented throughout the life cycle of the Project (i.e. throughout assessment, construction, and implementation phases).

WSP will only be involved in the stakeholder engagement and grievance management process for the assessment phase. The Project proponent and the Contractor will be responsible for implementation of the grievance mechanism throughout the construction phase. Once established, the Project infrastructure is to be handed over to Eskom for operation and maintenance, who will be responsible for managing grievances in line with their existing complaint handling process (not covered herein).

GRIEVANCE REDRESS PROCEDURE

This grievance mechanism sets out the following steps to be taken to resolve grievances.

1. **Register grievance**
    - A grievance can be submitted in a written letter, e-mail, fax, or raised verbally in person or via telephone.
    - Grievances raised during the assessment process are to be submitted to the EAP via the details provided as per the stakeholder engagement notifications. The EAP will notify the Proponent of the grievance.
    - Grievances raised during the implementation process are to be submitted to the Proponent / Contractor via the relevant details, which are to be made available to registered stakeholders prior to commencement of onsite activities, as well as via site notice boards.
    - In the event that a complaint is raised verbally, the responsible person must obtain the approval of the complainant as to the documented complaint (by way of signature of the Receipt of Grievance Form). Should the complainant have literacy issues, the responsible person may request that a third party (friend / relative of complainant) is available to verify / approve the contents of the documented complaint to the satisfaction of the complainant.
    - The submission should include the nature of the grievance, the date when it occurred and the name and contact details of the complainant.
    - Grievances will be accepted anonymously or through a third party (e.g. unions, NGOs, local authorities, community representatives, etc.).
    - Individuals have the right to request that their name be kept confidential throughout the grievance process.
    - As men and women may communicate their grievances differently, and also have different types of grievances, the complainant may request that their grievance is processed by a female / male representative. In the event that such a request is made, the Proponent, as far as reasonably practicable, will accommodate this request.
2. **Within a Week (7 days) of receiving the grievance the Proponent will:**
    - Enter the grievance into the Proponent's records that track grievances;
    - Assess the grievance according to specific criteria and if necessary, develop an appropriate approach for the particular grievance;
    - Provide a written acknowledgement of the grievance including the name of the responsible person to contact about progress, an explanation of the steps that will be taken to investigate, discuss and resolve the grievance, and an anticipated timetable for processing the grievance.
3. **Processing the Grievance:**

    The responsible person will:

- Identify the parties involved;
- Clarify issues and concerns raised by the grievance through direct dialogue;
- Classify the grievance in terms of seriousness according to the gravity of the allegation, the potential impact on an individual's or a group's welfare and safety, or the public profile of the issue;
- Convene a staff group with expertise relative to the grievance;
- Determine the method for resolving the grievance – the most common approaches, not excluding others, will be:
    i. The Proponent proposes a solution;
    ii. The Proponent and aggrieved party decide together the solution;
    iii. The Proponent and aggrieved party defer to a third party for mediation / arbitration.
- Gather views of other stakeholders, including those of the Proponent and if necessary, an agreed neutral technical opinion;
- Determine initial options that parties have considered and explore various approaches for settlement;
- Conduct the process as agreed;
- Close the grievances by signing the Complaint Close-Out Form (i.e. that the grievance has been resolved satisfactory to both parties).
- The Proponent may "close" the grievance even if the complainant is not satisfied with the outcome. This option can be pursued by the Proponent in the case that the complainant is unable to substantiate a grievance, or if there is an obvious speculative or fraudulent attempt. In such situations, the Proponent's efforts to investigate the grievance and to arrive at a conclusion will be well documented and the complainant advised of the situation. The Proponent (or contractors working for the Proponent) will not dismiss grievances based on a cursory review and close them in their grievance record unless the complainant has been notified and had the opportunity to provide supplementary information / evidence;
- Keep a record that tracks the progress and communications for each grievance.

4. Processing Timeline

- The Proponent will aim to bring the grievance to a resolution within 30 days of receiving the grievance. The grievance shall be acknowledged within 7 days by the responsible person, and responded to within 30 days. If the matter takes longer than 30 days to resolve, the complainant will be informed through dialogue and in writing, of the reason for the delay, any advances or difficulties encountered and the anticipated new resolution date.

RECOURSE

If the complainant is not satisfied with the outcome of the grievance process the aggrieved party has the right to address the grievance via the judicial system.

MANAGING, TRACKING, RECORDING GRIEVANCES – INTERNALLY

In terms of managing grievances the Proponent will:

- appoint a senior manager to oversee the Grievance Mechanism. Another member of staff will be appointed to carry out the day-to-day work in this area and involve specialist staff and external parties, where required, who may need to be consulted to resolve a grievance.
- maintain a register of grievances. All activities, including registration of the grievance and the progress through to outcome will be recorded.
- ensure that grievances and resolutions are communicated internally to all staff through monthly reports.
- launch the Grievance Mechanism and regularly remind communities that it is available to use.

Contractors are expected to follow this Grievance Procedure. Contractor shall be proactive and available to participate in the grievance resolution processes. Contractor participation is intended to allow for specific contractor grievances to be addressed efficiently.

Contractors shall ensure that all individual contractor employees are aware of the Grievance Procedure. Contractors will receive any grievance from an individual or community and notify the Proponent thereof immediately.

Contractors shall not make any direct agreements or resolution with local communities without prior coordination of such actions with the Proponent.

The Contractor's community relations team (or equivalent) will attend all coordination meetings requested by the Proponent, as required. The contractor community relations management (or equivalent) will report to the the Proponent's management team on a regular basis – in regards to social incidents and community relations issues. The Proponent, or their representative, will conduct regular audits on contractors to ascertain compliance with this Grievance Procedure.

DISCLOSURE OF THE GRIEVANCE MECHANISM

The grievance mechanism will be made public through:

- Stakeholder engagement during the BA assessment; and
- Stakeholder engagement during the implementation phase.

9.13.2 *GRIEVANCE MECHANISM - INTERNAL*

The Proponent will establish a Grievance Mechanism that will set out the process for workers to communicate their grievances. The grievance mechanism will be available to workers of the Proponent, Contractors and subcontractors.

A Code of Conduct will set out practice measures that the construction workers will have to adhere to, to ensure a positive relationship is built and maintained with the landowners and local communities.

9.14 HIV/AIDS MANAGEMENT PLAN

Should the project be developed, an HIV/AIDS plan will be developed, however for input into this EMPr, a generic and high-level management plan has been compiled.

9.14.1 *OBJECTIVES OF THIS PLAN*

The overall objectives of the HIV/AIDS management plan are:

- Create awareness around HIV/AIDS amongst onsite personnel;
- Mitigate and manage the spread of HIV/AIDS onsite; and
- Provide support for staff who have HIV/AIDS

9.14.2 *GUIDING PRINCIPLES*

1. **Non- discrimination:** The respect of human rights and dignity of persons infected or affected by HIV/ AIDS requires equality between individuals living with HIV/AIDS and those without. No employee will be discriminated against on the basis of his or her real or perceived HIV positive status. This includes access to training and promotion.
2. **Job Security:** Employees with HIV infection or AIDS will not be dismissed on the grounds of their status. Persons with AIDS-related illnesses should be able to work for as long as medically fit in available, appropriate work (reasonable accommodation).
3. **Confidentiality :** All persons with HIV or AIDS have the legal right to privacy. No employee or applicant for a job shall be required to disclose HIV-related personal information. Nor should co-workers be obliged to

reveal such information about fellow workers. Company management and medical staff as well as union leaders and officials are bound by strict confidentiality about a person's status.

4 **Voluntary Counselling and Testing (VCT) :** No HIV/AIDS testing will be required for job applicants or for persons already in employment. Individuals are encouraged to know their HIV status through testing. Testing must be voluntary, confidential and with the informed and written consent of the person concerned. Professional pre- and post-testing counselling services must be available.

5 **Treatment and Care :** Workers infected with HIV and suffering from AIDS and their dependents are entitled to the same health services as those with other diseases. Treatment with antiretroviral drugs must be available when VCT is advocated. Dependents of workers who have died from AIDS or AIDS-related diseases must have access to the same care as those who have died from other diseases or industrial accidents.

6 **Gender Equality :** The gender dimensions of the epidemic are recognised by the social partners. Gender discrimination at the workplace is ruled out. Sexual harassment and the exploitation of dependency of women is an offence.

7 **Occupational Health and Safety :** The work environment must be healthy and safe. Tools which bear the danger of injuries such as cuts should not be shared between workers.In case of accidents which involve blood and body fluid emissions, first aid must be exercised with the use of protective barriers, such as gloves and masks, which prevent direct contact with blood or other body fluids.

8 **Prevention and Behaviour Change :** Employees with HIV and AIDS shall not be unfairly discriminated against in the allocation of employee benefits. With regard to sick leave, HIV and AIDS related illness will be treated no different from other chronic or life threatening conditions. Health and social security schemes run by the company shall give the same benefits to those with HIV and AIDS as to any other worker. The same applies to separation allowance, retirement schemes and pension benefits.

9 **Prevention and Behaviour Change :** HIV infection is preventable. The parties will promote prevention efforts at the workplace, within families and in the wider community. Because it is within the power of each individual to avoid HIV infection, it is expected that employees take responsibility of their own health. They are urged to avoid risky behaviour such as unprotected sexual intercourse and the injection of drugs through shared needles.

9.14.3 *IMPLEMENTAION*

The plan will be implemented onsite through the following:

1 This HIV/AIDS management plan shall be made known and explained to all employees through the distribution of the text as a brochure in the appropriate languages and through meetings.

2 The implementation of this plan includes information and education activities aimed at communicating correct information about HIV/AIDS and eradicating myths in order to eliminate stigma and discrimination.

3 Rietkloof will organise and if necessary and appropriate with the participation of health professionals, regular awareness and prevention programmes about HIV/AIDS during working time.

4 As condoms and femidoms are an effective barrier to sexually transmitted infections and HIV transmission, condoms and femidoms will be made available at no cost on the construction site.

5 Meetings, information and training activities should be included in an action programme with an implementation plan for a defined period of time. This should include material to be acquired or produced. The company should make provisions in its budgetary process to include the cost of activities and materials.

6 Disputes or grievances arising from the application of the principles of this policy and its implementation are dealt with by the HIV/AIDS Committee and/or in established dispute resolution or grievance procedures.

9.15 CHANCE FIND PROCEDURE

The following procedural guidelines must be considered if previously unknown heritage resources are exposed or found during the construction of the Rietkloof WEF project area.

IDENTIFICATION AND EXPOSURE

Archaeological resources may be identified during construction or accidentally exposed. The initial procedure when such sites are found aim to avoid further damage. The following steps and reporting structure must be observed in all instances:

1. Stop all work in the area to avoid damaging the feature;
2. Do not further disturb any heritage resource that you may encounter;
3. The identifier must immediately inform his/her supervisor of the discovery;
4. The supervisor must ensure that the site is secured and control access;
5. The supervisor must then inform the relevant ESCO / ECO;
6. The ESCO / ECO shall contact the SAHRA and HWC and appoint an archaeological consultant to record the site and excavate if necessary; and
7. Work may only resume once clearance is given in writing by the archaeologist and SAHRA.

GRAVES AND MIDDENS:

If a grave or midden is uncovered on site, the following steps and reporting structure must be observed in all instances:

1. Stop all work in the area to avoid damaging the feature;
2. Do not further disturb any heritage resource that you may encounter;
3. The identifier must immediately inform his/her supervisor of the discovery;
4. The supervisor must ensure that the site is secured and control access;
5. The supervisor must then inform the relevant ESCO / ECO;
6. The ESCO / ECO must contact SAHRA, the National Monuments Council (NMC) and the South African Police Service (SAPS);
7. In the case of graves, arrangements shall be made for an undertaker to carry out exhumation and reburial in consultation with SAPS after a permit has been obtained from SAHRA to do so;
8. The undertaker will, together with the NMC, be responsible for attempts to contact family of the deceased and for the site where the exhumed remains can be re-interred; and
9. Work may only resume once clearance is given in writing by the NMC.

PALAEONTOLOGICAL SITES

1. Should any fossil remains, such as vertebrate bones, teeth or petrified wood, be found or exposed anywhere within the project area, the following steps and reporting structure must be observed in all instances:
2. Stop all work in the area to avoid damaging the feature;
3. Do not further disturb any heritage resource that you may encounter;
4. The identifier must immediately inform his/her supervisor of the discovery;
5. The supervisor must ensure that the site is secured and control access;
6. The supervisor must then inform the relevant ESCO / ECO;
7. The ESCO / ECO shall contact the SAHRA and HWC and appoint a palaeontological consultant to record the site and excavate if necessary; and
8. Work may only resume once clearance is given in writing by the palaeontologist and SAHRA/HWCA.

9.16 SECURITY POLICY

A generic high-level security policy has been compiled for the drafting of this EMPr. Should the project be developed further, a site-specific policy will be produced.

This procedure shall be applicable to all staff working within the Rietkloof WEF to comply with the relevant regulations and international standards.

Rietkloof's overarching objective is to protect the people and assets in a way that minimises conflict and respects the human rights of its diverse stakeholders, avoids creating or worsening conflict and address security threats in as peaceful a way as possible. Rietkloof have adapted the IFC Performance Standards and supporting World Bank Group Environmental, Health and Safety Guidelines as the overarching standards associated with human rights, labour force management, vulnerable groups and stakeholder engagement to guide it towards achievement of appropriately high levels of environmental and social performance throughout the Project's life cycle.

A security company must be employed to guard the site and monitor access and must be registered with the Private Security Industry Regulatory Authority (PSIRA). The company should be utilised for the project life-cycle,

alternatively different companies can be used for the construction, operations and decommissioning phases. The choice is at the discretion of the Holder of the EA.

The following guiding principles have been developed for site security:

- All access roads shall be gated to restrict access to the general public. Gates will be required to be kept locked when construction is occurring or when turbine maintenance is not occurring.
- The Contractor, prior to arriving on site, will assess any risks posed by its security arrangements to people within and outside the Project site.
- No firearms allowed on site or in vehicles transporting staff to / from site (unless used by security personnel).
- The Operations and Maintenance Building ("O&M building") shall be locked at all times when Project personnel are not inside.
- The security arrangements must take account of the principles of proportionality and good international practice in relation to hiring, rules of conduct, training, equipping, and monitoring of security;
- The contractor and Holder of the EA:
    - is required to make reasonable inquiries to ensure that those providing security are not implicated in past abuses; and
    - Ensure that the security company is adequately trained in the use of force and appropriate conduct, and they act within the applicable law.
- A grievance mechanism for affected communities shall be provided to express any concerns about security arrangements.

Rietkloof have adapted the United Nations Basic Principles on the use of Force and Firearms and Voluntary Principles on Security and Human Rights.

9.17 COVID-19

PREVENTION AND RESPONSE

A dedicated team with responsibilities to identify and implement actions to mitigate the effects of COVID-19 on the company and community should be appointed.

INFORMATION

Information dissemination and training are an effective way to reduce the risk for both the company and the general public.

COVID-19 symptoms include: fever, tiredness, difficulty breathing, dry cough, chills, repeated shaking with chills, muscle pain, headache, sore throat, and new loss of taste or smell. Some patients may have nasal congestion, runny nose, or diarrhoea. Symptoms may appear two to 14 days after exposure to the virus.

EMPLOYEE QUESTIONNAIRE

To prevent potentially infected staff from entering the workplace and infecting co-workers, a short questionnaire could be used. Workers should only report to work if they answer "no" to all the questions.

The following is an example:

- Have you, in the last two weeks, been in close contact with a person who has COVID-19?
- Have you, in the last two weeks, been in a country/region with a high number of cases of COVID-19?
- Do you have a fever?
- Have you used medications such as paracetamol or aspirin to suppress fever in the last 24 hours?
- Are you coughing (even mildly)?
- Do you currently experience shortness of breath?

PREVENTION METHODS

SICK PERSONS TO STAY HOME

Workers requested to stay away from work in cases where they exhibit any COVID-19 symptoms or have been in close contact with a confirmed COVID-19 patient during the previous 14 days.

Workers who do not feel well should seek immediate medical advice. An employee who works while evidencing mild COVID-19 symptoms can risk spreading this infectious disease to others.

COUGH HYGIENE

To reduce the risk of infected persons spreading the virus by coughing and sneezing, workers are to be instructed to follow the cough etiquette outlined below:

- Cover the mouth and nose with a tissue when coughing or sneezing, and dispose of the used tissue in a wastebasket.
- When no tissue is available, cough or sneeze into the upper sleeve or elbow, not into the hands.
- Clean hands after coughing or sneezing, preferably by thorough water-soap handwashing, following the recommendations of health organizations. If soap and water are not available, use a hand sanitizing gel.

SOCIAL DISTANCING

To prevent person-to-person infection, it is important to minimize direct contact as much as possible. The contractor is to inform workers about the hazards of close contacts, including with direct co-workers, and promote alternative behaviours, such as maintaining safe distances and using alternatives for handshakes.

HAND SANITATION

Promote frequent and thorough water-soap hand washing and provide enough places for workers to wash their hands. If soap and running water are not immediately available, provide alcohol-based hand rubs containing at least 60% alcohol. Ensure that these facilities are sufficient in number and are available close to the work area.

CLEANING AND DISINFECTING

Frequently – and at least daily - clean touched surfaces, such as tables, light switches, appliances, countertops, handles, desks, phones, keyboards, toilets, taps, sinks, and so forth. Use the cleaning agents that are routinely used in these areas and follow the directions on the labels. For multiuse equipment, clean after every use.

Workers are to be instructed to clean their work areas and equipment at the end of each shift. Equipment and instructions on how to do this are to be provided.

10 CONCLUSION

The BAR Process assessed both biophysical and socio-economic environments and identified appropriate management and mitigation measures. The biophysical impact assessment revealed that there are no environmental fatal flaws and no unacceptably significant negative impacts associated with the proposed project, should mitigation and management measures be implemented. In addition, it should be noted that the overall socio-economic impacts associated with the project are positive and include the creation of job opportunities and contributions to the local, regional and national economies.

WSP is of the opinion that provided this project is mitigated, as per the mitigation and management measures outlined in this EMPr, the project will result in impacts that should not negatively affect the environment. It is the applicant's responsibility to ensure that this EMPr is made binding on the contractor by including the EMPr in the contract documentation. The contractor should thoroughly familiarise himself with the requirements of the EMPr and appoint an EO to oversee the implementation of the EMPr on a day-to-day basis. In addition, the applicant should appoint an external ESCO / ECO to undertake monthly compliance audits against the requirements of the EMPr as well as the EA.

In terms of the merged EA issued in September 2019. the Environmental Management Programme (EMPr) for the proposed Rietkloof WEF requires approval from the DFFE prior to Financial Close and commencement of construction, to ensure compliance with the EA. Condition 12 of the EA for the proposed Rietkloof WEF requires that:

"*The Environmental Management Programme submitted as part of the Application for EA must be amended and submitted to the Department for written approval prior to commencement of the activity. The recommendations and mitigation measures recorded in the BAR dated 11 February 2019 must be incorporated as part of the EMPr. The EMPr must be inclusive of the final Conservation Management Plan. Once approved, the EMPr must be implemented and adhered to.*"

Therefore, this EMPr (this Report) is an update of the February 2019 EMPr. This EMPr is updated to include, but not limited to, requirements as contained in the conditions of the EA, the results of the specialist walkdowns, the final development layout and the required final Conservation Management Plan[20].

This EMPr is being made available to Organs of State and Interested and Affected Parties (I&APs) for a 30-day comment period from **9 December 2021 to 31 January 2022**. Thereafter, this EMPr, inclusive of Stakeholder comments, final development layout and final Conservation Management Plan will be submitted to the DFFE as per the requirements of Condition 12 of the EA.

It must be noted that subsequent to the merged EA issued and during the final layout development and preliminary design and micro-siting, several amendments have been proposed for the Rietkloof WEF project. This includes reducing the number of turbine positions from the authorised 60 to 47, the increase of the rotor diameter to 180m and the hub height to 125m for all turbines, as well as some administrative amendments. The Amendment Application was submitted to the DFFE on **9 December 2021** and will run in parallel with the EMPr and layout approval process. It must be noted that this amended EMPr has taken the new proposed amendments into account.

Parties responsible for transgression of this EMPr should be held responsible for any corrective actions that may need to be undertaken. Parties responsible for environmental degradation through irresponsible behaviour/negligence should receive penalties.

WSP is of the opinion that should the identified mitigation and management measures be implemented, the proposed project ought to proceed to provide the following opportunities:

- Opportunity to develop a wind farm coupled with conservation of land;
- The Rietkloof WEF project will be economically beneficial at the local and regional level through job creation, procurement of materials and the provision of services and other downstream economic development;

[20] It must be noted that the Part 2 Amendment Application recently submitted for the Rietkloof WEF (Ref: 14/12/16/3/3/1/1977/AM1) requests the removal of this requirement from the EA and subsequently the EMPr.

- The Rietkloof WEF project will serve to diversify the economy and electricity generation mix through the addition of renewable (solar) power; and
- The establishment of Rietkloof WEF will provide numerous opportunities for skills transfer and development within the local area.

It must be noted that the layout included in the final EMPr is considered a worst-case final layout with 47 turbines. It is however likely that once the turbine manufacturer has been confirmed, the layout will drop to a maximum of 34 turbines which will also allow for the micro-siting / removal of the turbines identified by the Bat specialist (i.e. R27, R37 and R49).

APPENDIX

A EAP CV

APPENDIX

B A3 MAPS

APPENDIX

C TRAFFIC MANAGEMENT PLAN

APPENDIX

D CONSTRUCTION AND OPERATIONAL AVIFAUNA PLAN

APPENDIX

E BAT MONITORING PLAN

APPENDIX

F HERITAGE CONSERVATION MANAGEMENT PLAN

APPENDIX

G AVIFAUNA WALKDOWN REPORT AND PRE-CONSTRUCTION MONITORING

APPENDIX

H BAT WALKDOWN LETTER

APPENDIX

I ECOLOGY WALKDOWN REPORT

APPENDIX

J HERITAGE WALKDOWN REPORT

APPENDIX

K AGRICULTURAL WALKDOWN REPORT

APPENDIX

L SURFACEWATER WALKDOWN LETTER

APPENDIX

M VISUAL SPECIALIST STATEMENT

APPENDIX

N SOCIAL SUMMARY

APPENDIX

O GEOTECHNICAL INPUT