

Our reference: 201101

Your reference: DFFE Ref: 2021-03-0009

Date: 28 July 2021

**Physical address:**

Department Forestry, Fisheries and the Environment  
(DFFE)  
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Department of Forestry, Fisheries and the Environment  
Chief Director: Integrated Environmental Authorisations  
Private Bag X447  
Pretoria  
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**ATTENTION: Mr JAY-JAY MPELANE**

**SUBMISSION OF DRAFT AMENDMENT REPORT FOR THE MODDERFONTEIN WIND ENERGY FACILITY, LOCATED IN THE BEAUFORT WEST REDZ – PART 2 AMENDMENT APPLICATION.**

On behalf of our Client (**South African Renewable Green Energy (Pty) Ltd.**), please find attached to this cover letter the **draft amendment report (for public review)** for the above listed Renewable Energy project.

The Client (Project Applicant) would like to apply for the following amendment to the current Environmental Authorisation:

Part 2 Amendment: Amend the technical specifications of the existing Environmental Authorisation.

- The Applicant wishes to amend the following authorised specifications of the Wolsley Wind Energy Facility (WEF):
  - ❖ Amendment of the technical design (notably an increase in authorised turbine blade diameter and generating capacity).
  - ❖ Decrease the number of authorised turbines.

Non-substantial Amendments to the EA, included as part of this appendment process.

- ❖ Administratively splitting the environmental authorisations to allow for the independent commercial operation of two separate turbine clusters.
- ❖ Removal of a redundant land parcel, Portion 3 of the farm Noblesfontein 227, from the EA.

The above-mentioned changes require specialist assessments and the compilation of an Amendment Application Report to assess the potential impacts of the proposed material changes. The Draft Amendment Application Report (for Public Participation) is being submitted to your Department for comment.

Please do not hesitate to contact me directly on (021) 701 5228 or (081) 266 7709 should you require any clarification or additional information.

Yours Faithfully,

**Johann Kilian**  
*Senior Environmental Consultant*  
*Terrmanzi Group (Pty) Ltd*



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VIEW OF SITE  
Amended Layout



# DRAFT AMENDMENT REPORT FOR PUBLIC CONSULTATION FOR THE MODDERFONTEIN WIND ENERGY FACILITY, LOCATED IN THE BEAUFORT WEST REDZ – PART 2 AMENDMENT APPLICATION

APPLICANT: SOUTH AFRICAN RENEWABLE GREEN ENERGY (PTY) LTD  
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# terramanzi

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JULY 2021

**APPLICABLE LEGISLATION**

**NEMA EIA Regulations  
(2014 as amended)  
(National DFFE)**

**COMPETENT AUTHORITY REFERENCE NUMBER/S**

DEA Ref: 12/12/20/1993/3  
DEA Ref: 12/12/20/1993/3/AM1  
DEA Ref: 12/12/20/1993/3/AM2  
DEA Ref: 12/12/20/1993/3/AM3

**Report Title**

Draft amendment report for public consultation for the Modderfontein Wind Energy Facility, located in the Beaufort West REDZ - Part 2 Amendment Application

**Author (EAP)**

Johann Kilian -Terramanzi Group (Pty) Ltd.

**Specialist Sub-Consultants**

Aquatic Specialist Study – Blue Science Pty Ltd (C/O Antonia Belcher)

Avifaunal Impact Assessment – Chris van Rooyen Consulting (C/O Chris van Rooyen)

Agro-Ecosystems Assessment– AGRInformatics Natural Resource Specialists (C/O Francois Knight)

Noise Impact Report – dBAcoustics (C/O BJB van der Merwe)

Visual Impact Assessment – Environmental Planning and Design (C/O Jon Marshall)

Terrestrial Ecology – Nick Helme Botanical Surveys (C/O Nick Helme)

Bat Specialist Report – Arcus Consultancy Services South Africa Pty Ltd (C/O Michael Brits and Mark Hodgson)

Heritage Impact Assessment – CTS Heritage (C/O Jenna Lavin)

Archaeological Specialist Study – CTS Heritage (C/O Jenna Lavin)

Palaeontological Specialist Assessment – CTS Heritage (C/O Jenna Lavin)

Social Impact Assessment – Batho Earth (C/O Ingrid Snyman)

Town Planning – Warren Petterson Planning (C/O Andries du Plessis)

Traffic Impact Assessment – Innovative Transport Solutions (C/O Christoff Krogscsheepers)

**Applicant**

South African Renewable Green Energy (Pty) Ltd (SARGE)

**Report Version**

Draft Amendment Report for Public Participation

**Submission Date**

28 July 2021

Please use the following as a reference for this Report: Terramanzi Project # 201101 – Technical Specification Upgrades to the Modderfontein Wind Energy Facility, located in the Beaufort West REDZ - Part 2 Amendment Application

**Purpose of this Document:**

South African Renewable Green Energy (Pty) Ltd (hereinafter referred to as the “Applicant” or “SARGE”) is authorised to build a Wind Energy Facility (hereinafter referred to as a “WEF”) located on a site between Beaufort West and Victoria West within the Ubuntu and Beaufort West Local Municipalities, straddling the Northern Cape and Western Cape Provinces.

Environmental Authorisation (EA) for this WEF was first issued by the Department of Environmental Affairs on 22 of February 2012 (DEA Ref: 12/12/20/1993/3), after which the following three amendments for extension were made:

- 4 February 2014, extension to the EA, DEA Ref: 12/12/20/1993/3/AM1.
- 8 February 2017, extension to the EA, DEA Ref: 12/12/20/1993/3/AM2.
- 13 February 2020, extension to the EA, DEA Ref: 12/12/20/1993/3/AM3.

The following is currently authorised in terms of the abovementioned EA (as amended) for the construction of the WEF:

- Up to 67 wind turbines (as indicated in the layout map included in Appendix I of the EIR dated January 2011) with a total generating capacity of up to 201MW using turbines with a generating capacity of up to 3MW.
- 30,06 ha of the proposed site will be permanently transformed for the installation of the turbines and related infrastructure.
- Each turbine will be a steel tower (between 80m and 125m in height), nacelle (gear box) and three rotor blades with a rotor diameter of between 90m and 110m (i.e. each blade up to 55m in length).
- 67 temporary turbine laydown areas of 50m X 25m (83750 m<sup>2</sup>).
- 67 concrete foundations to support the turbine towers (15m X 15m X 2.5 m in depth).
- A 132kV substation with high voltage yard footprints of approximately 100m X 100m (1000 m<sup>2</sup>).
- Underground cabling between the project components.
- One new overhead 132kV power lines of up to 1.5km in length, turning into the existing Droerivier/Hydra-2400kV line.
- Internal access roads (5m wide and 40km long) linking the wind turbines and the infrastructure on the site.

**Purpose of this Document (Continued):**

**Details of the proposed Amendment, includes:**

- Reduction in the number of turbines from 67 to 34.
- Increase in the individual turbine rating from up to 3 MW to up to 5.6 MW.
- Increasing the WTG dimensions of up to 119m of hub height and up to 162m of rotor diameter, with a total of up to 81 m blade length.
- Total WEF generation capacity reduced from 201 MW to 190.4 MW.
- 34 temporary turbine laydown areas of 80m X 30m (81 600m<sup>2</sup>).
- 34 Concrete foundations to support the turbine towers (15m X 15m X 2.5m in depth)
- A 132kV substation with high voltage yard footprints of approximately 100m X 100m (1000m<sup>2</sup>).
- Underground cabling between the project components.
- One new overhead 132kV power lines of up to 1.5km in length, turning into the existing Droerivier/Hydra-2400kV line.
- Internal access roads (5m wide and 40km long) linking the wind turbines and the infrastructure on the site.
- Administratively splitting the environmental authorisations to allow for the independent commercial operation of a Cluster A and a Cluster B for the site.
- Removal of a redundant land parcel, Portion 3 of the farm Noblesfontein 227 from the EA, as no development is currently authorised on this land parcel and not development is proposed over this land parcel.

Based on the available information it is reasonable to conclude that potential environmental impacts related to the Modderfontein WEF have been adequately assessed and confirmed by the various independent Specialists. Please refer to their studies and supporting statements attached as Appendix C (and summarised in Section 8 of this report)

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## **APPENDICES INDEX**

*Please note that the Appendices are located after the Amendment Report and have detailed Cover Pages available to facilitate document navigation for the reader.*

### **Appendix A – Site Maps**

### **Appendix B – Photographs of the Site**

### **Appendix C1– Updated Specialist Reports -2021**

- Aquatic Specialist Study – Blue Science Pty Ltd (C/O Antonia Belcher, June 2021)
- Avifaunal Impact Assessment – Chris van Rooyen Consulting (C/O Chris van Rooyen, June 2021)
- Visual Impact Assessment – Environmental Planning and Design (C/O Jon Marshall, June 2021)
- Terrestrial Ecology – Nick Helme Botanical Surveys (C/O Nick Helme, June 2021)
- Bat Specialist Report – Arcus Consultancy Services South Africa Pty Ltd (C/O Michael Brits and Mark Hodgson, June 2021)
- Heritage Impact Assessment – CTS Heritage (C/O Jenna Lavin, June 2021)
- Archaeological Specialist Study – CTS Heritage (C/O Jenna Lavin, May 2021)
- Palaeontological Specialist Assessment – CTS Heritage (C/O Jenna Lavin, June 2021)
- Social Impact Assessment – Batho Earth (C/O Ingrid Snyman, July 2021)

### **Appendix C2– Original Specialist Reports**

- Ecological Study – David Hoare Consulting cc (C/O David Hoare, March 2011)
- Avian Impact assessment – Avisense Consulting (C/O Andrew Jenkins March 2011)
- Geological Report – Outeniqua Geotechnical Services Civil Laboratories (C/O Ian Paton, March 2011)
- Archaeological Impact Assessment– Department of Archaeology, Rhodes University (C/O Dr. Johan Binneman, Ms Celeste Booth and Ms Natasha Higgitt, March 2011)
- Palaeontological Desktop Assessment – (C/O L. Rossouw, March 2011)
- Visual Impact Assessment – MetroGIS (C/O Lourens du Plessis, March 2011)
- Noise Impact Study – M2 Environmental Connections cc (C/O M. de Jager, March 2011)
- Social Impact Assessment – Batho Earth (C/O Ingrid Snyman, March 2010)

### **Appendix C3– Unaffected Specialist Verification Letters**

- Agro-Ecosystems Assessment– AGRInformatics Natural Resource Specialists (C/O Francois Knight, July 2021)
- Town Planning – Warren Petterson Planning (C/O Andries du Plessis, June 2021)
- Traffic Impact Assessment – Innovative Transport Solutions (C/O Christoff Krogscheepers, June 2021)
- Noise Impact Report – dBAcoustics (C/O BJB van der Merwe, July 2021)

### **Appendix C4– Specialist Declarations**

### **Appendix D – Public Participation Folder**

- I&P notification – July 2021
- Advertisements (provincial & local) - July 2021
- Site Notices – July 2021
- Registered I&AP database (extracted from previous EIA and recently verified)

### **Appendix E – Environmental Management Programme (EMPr)**

- Environmental Management Programme



**Appendix F – Competent Authority Correspondence**

- Environmental Authorisation (dated 22/2/2012 with DEA Ref: 12/12/20/1993/3)
- Environmental Authorisation Amendment (dated 4/2/2012 with DEA Ref: 12/12/20/1993/3/AM1)
- Environmental Authorisation Amendment (dated 8/2/2012 with DEA Ref: 12/12/20/1993/3/AM2)
- Environmental Authorisation Amendment (dated 13/2/2012 with DEA Ref: 12/12/20/1993/3/AM3)
- DFFE - Public Participation Plan Approval dated 07/07/2021

**Appendix G – EAP Curriculum Vitae**

**Appendix H – Amendment Application form**

**Appendix I – Previous EIA**

**Appendix J – Landowner Consents**

## 1 DEFINITIONS AND TERMINOLOGY REFERRED TO IN THIS REPORT

*PLEASE REFER TO APPENDIX I FOR THE DEFINITIONS AND TERMINOLOGY REFERRED TO IN THIS REPORT*

## 2 INTRODUCTION

### 2.1 PROJECT OVERVIEW

This application is for a proposed amendment to the authorised Modderfontein Wind Energy Facility (WEF) located approximately 45km south-east of Victoria West, which straddles the northern and western cape provinces and located in the Beaufort West REDZ. The original Environmental Authorisation (EA) allowed for up to 67 wind turbine generators (WTG) for the Modderfontein WEF with a total generating capacity of 201MW using turbines with a generating capacity of up to 3MW. The applicant, South African Renewable Green Energy (Pty) Ltd (SARGE) along with technical partner Modderfontein (Pty) Ltd, proposes amending the existing EA by decreasing the number of WTG from 67 to 34. The 34 WTG will be divided into two clusters to allow the applicant and technical partner to be granted separate EAs for the proposed developments as agreed upon<sup>1</sup>. Cluster B (25 WTG) will be managed by Modderfontein (Pty) Ltd, and Cluster A (9 turbines) will be managed by the applicant, SARGE. The generating capacity of the WTG will be upgraded from 3MW to 5.6MW and the hub height will be up to 119m with a rotor diameter of 162m with a total generating capacity of 190.4MW.

Terramanzi Group (Pty) Ltd ([www.terramanzi.co.za](http://www.terramanzi.co.za)) has been appointed as the Independent Environmental Practitioner (EAP) to undertake this Application for the EA Amendment on behalf of the Applicant.

Environmental Authorisation (EA) was first issued by the Department of Environmental Affairs on 22 of February 2012 (DEA Ref: 12/12/20/1993/3), after which the following three amendments for extension of the EA were made:

- 4 February 2014, extension to the EA, DEA Ref: 12/12/20/1993/3/AM1;
- 8 February 2017, extension to the EA, DEA Ref: 12/12/20/1993/3/AM2, and
- 13 February 2020, extension to the EA, DEA Ref: 12/12/20/1993/3/AM3.

The following is authorised in terms of the abovementioned EA (as amended) for the construction of a renewable energy facility:

- Up to 67 wind turbines (as indicated in the layout map included in Appendix I of the EIR dated January 2011) with a total generating capacity of 201MW using turbines with a generating capacity of up to 3MW.
- 30.06 ha of the proposed site will be permanently transformed for the installation of the turbines and related infrastructure.
- Each turbine will be a steel tower (between 80m and 119m in height), nacelle (gear box) and three rotor blades with a rotor diameter of between 90m and 110m (i.e. each blade up to 55m in length).
- 67 temporary turbine laydown areas of 50m X 25m (83750m<sup>2</sup>).
- 67 Concrete foundations to support the turbine towers (15m X 15m X 2.5m in depth).
- A 132kV substation with high voltage yard footprints of approximately 100m X 100m (1000m<sup>2</sup>).

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<sup>1</sup> Pre-application meeting with DFFE.

- Underground cabling between the projects components.
- One new overhead 132kV power lines of up to 1.5km in length, turning into the existing Droerivier/Hydra-2400kV line.
- Internal access roads (5m wide and 40km long) linking the wind turbines and the infrastructure on the site.

## 2.2 Proposed Amendment

The authorised project will be amended to split the development site into two clusters to allow for two separate Environmental Authorisations to be granted to two different technical partners as outlined in **Table 1**.

**Table 1:** Summary of proposed amendment.

	<b>Original EA</b>	<b>Proposed Amended EA Cluster B</b>	<b>Proposed Amended EA Cluster A</b>
<b>Applicant</b>	South African Renewable Green Energy (Pty) Ltd. (SARGE)	Modderfontein (Pty) Ltd (Technical Partner)	South African Renewable Green Energy (Pty) Ltd. (SARGE)
<b>Total number of WTG</b>	67	25	9
<b>WTG Rating</b>	3MW	5.6MW	5.6MW
<b>WTG Dimensions</b>	Hub height: 80m-125m. Rotor Diameter: 90-110m.	Hub height: Up to 119m. Rotor Diameter: 162m.	Hub height: Up to 119m. Rotor Diameter: 162m.
<b>Total WEF Generation Capacity (MW)</b>	201	140	50.4
<b>Temporary WTG laydown areas</b>	67 (83750m <sup>2</sup> )	25 (60 000m <sup>2</sup> )	9 (21 600m <sup>2</sup> )
<b>Concrete support foundations</b>	67	25	9

**Details of the proposed Amendment, includes**

- Reduction in the number of WTG from 67 to 34.
- Increase in the individual WTG rating from up to 3MW to up to 5.6MW.
- Increasing the WTG dimensions of up to 119m of hub height and up to 162m of rotor diameter, with a total of up to 81m blade length.
- Total WEF generation capacity reduced from 201MW to 190.4MW.
- 34 temporary WTG laydown areas of 80m X 30m (81 600m<sup>2</sup>).
- 34 Concrete foundations to support the WTG (15m X 15m X 2.5m in depth).
- A 132kV substation with high voltage yard footprints of approximately 100m X 100m (1000m<sup>2</sup>).
- Underground cabling between the project components.
- One new overhead 132kV power lines of up to 1.5km in length, turning into the existing Droerivier/Hydra-2400kV line.
- Internal access roads (5m wide and 40km long) linking the wind turbines and the infrastructure on the site.
- Administratively splitting the environmental authorisations to allow for the independent commercial operation of a Cluster A and a Cluster B for the site.
- Removal of a redundant land parcel, Portion 3 of the farm Noblesfontein 227 from the EA, as no development is currently authorised on this land parcel and not development is proposed over this land parcel.

The project will cover an area of 10 652ha of land on the remaining extent of the farm Modderfontein 228 and the farm Phaisantkraal 1.

The proposed amendment for WEF is presented in **Figure 2**.

Please note that **no additional Listed Activities** in terms of the National Environmental Management Act (No. 107 of 1998) (NEMA); Environmental Impact Assessment (EIA) Regulations 2017 (as amended) will be triggered by the proposed amendments.

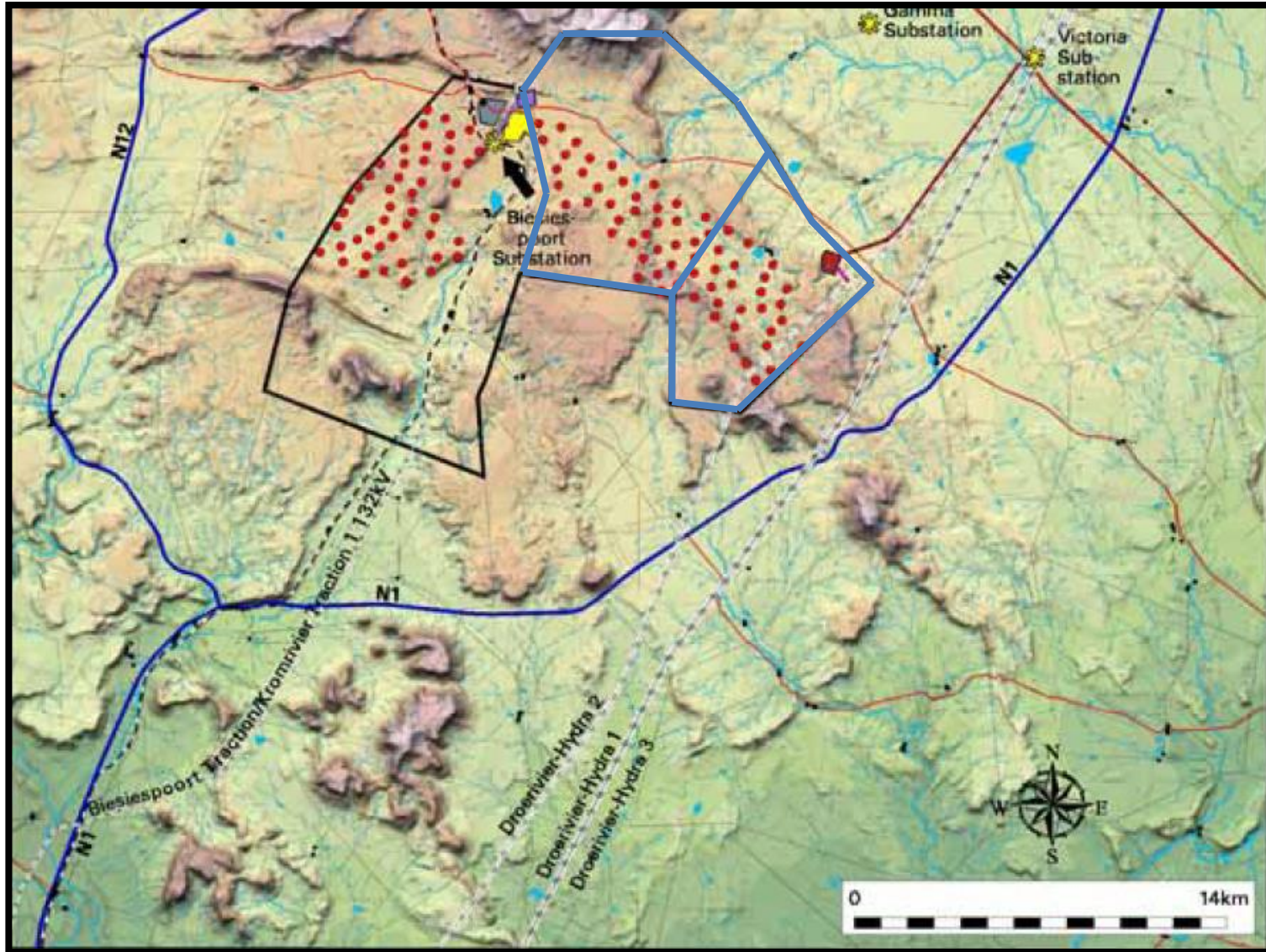
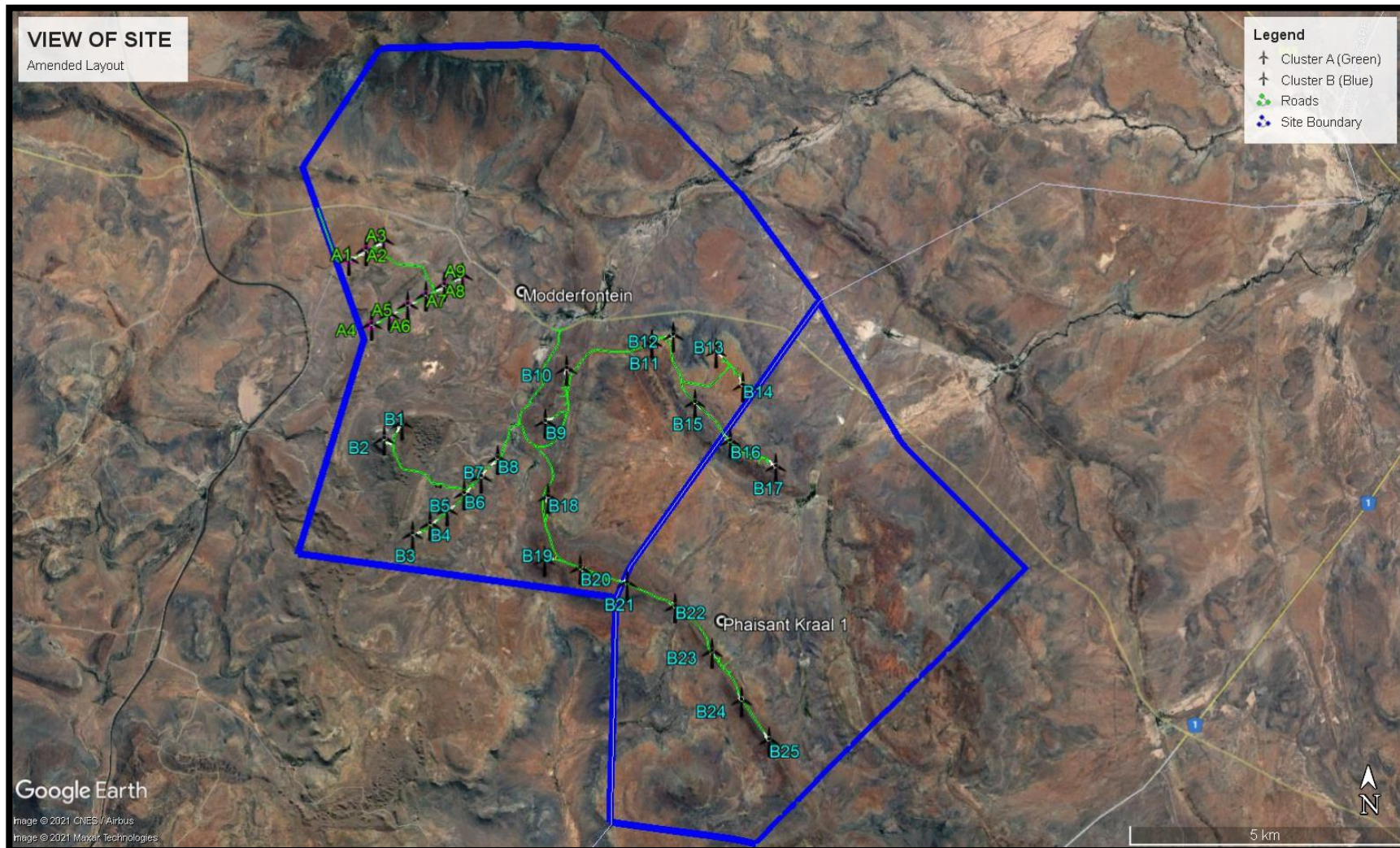


Figure 1: Previously Authorised layout for the Modderfontein WEF (Source: Karoo Final EIA by Savannah, 2011)





**Figure 2:** The amended layout for the Modderfontein WEF showing Cluster B (B1-B25) in Blue and Cluster A (A1-A9) in Green

### Design specifications

The holder of the EA is investigating a more efficient turbine technology (*than the turbine design assessed in the 2011 EIA*) to cater for a broad range of wind and site conditions, with improved reliability, serviceability and exceptional energy capture and delivery.

### Specialist studies completed

The impact ratings of the following Specialist Studies (previously completed in 2011) are not altered with the proposed amendment, as confirmed by the respective Specialists. (refer to Appendix C3 for confirmation):

- Ecological Study – David Hoare Consulting cc (C/O David Hoare, March 2011)
- Avian Impact assessment – Avisense Consulting (C/O Andrew Jenkins March 2011)
- Geological Report – Outeniqua Geotechnical Services Civil Laboratories (C/O Ian Paton, March 2011)
- Archaeological Impact Assessment– Department of Archaeology, Rhodes University (C/O Dr. Johan Binneman, Ms Celeste Booth and Ms Natasha Higgitt, March 2011)
- Palaeontological Desktop Assessment – (C/O L. Rossouw, March 2011)
- Visual Impact Assessment – MetroGIS (C/O Lourens du Plessis, March 2011)
- Noise Impact Study – M2 Environmental Connections cc (C/O M. de Jager, March 2011)
- Social Impact Assessment – Batho Earth (C/O Ingrid Snyman, March 2010)

The following Specialist reports (as previously completed in 2011) have been updated as the proposed changes may alter the impacts ratings:

- Aquatic Specialist Study – Blue Science Pty Ltd (C/O Antonia Belcher, June 2021)
- Avifaunal Impact Assessment – Chris van Rooyen Consulting (C/O Chris van Rooyen, June 2021)
- Agro-Ecosystems Assessment– AGRlinformatics Natural Resource Specialists (C/O Francois Knight, July 2021)
- Noise Impact Report – dBAcoustics (C/O BJB van der Merwe, July 2021)
- Visual Impact Assessment – Environmental Planning and Design (C/O Jon Marshall, June 2021)
- Terrestrial Ecology – Nick Helme Botanical Surveys (C/O Nick Helme, June 2021)
- Bat Specialist Report – Arcus Consultancy Services South Africa Pty Ltd (C/O Michael Brits and Mark Hodgson, June 2021)
- Heritage Impact Assessment – CTS Heritage (C/O Jenna Lavin, June 2021)
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- Town Planning – Warren Petterson Planning (C/O Andries du Plessis, June 2021)
- Traffic Impact Assessment – Innovative Transport Solutions (C/O Christoff Krogscheepers, June 2021)

This Draft Amendment Report was compiled to assess the potential impacts of the proposed amendments to the Modderfontein WEF on the receiving environment. The content of the report is based on the impact assessments of the 2011 EIA process and the potential impacts, based on recent specialist input, of the proposed amendments.

The draft Amendment Report will be subject to a **30-day Public Participation Process (PPP)** which will **commence on 29 July 2021 and conclude on 30 August 2021**. All comments received during the 30-day PPP for the draft Amendment Report will be recorded and addressed in the Comments and

Response Report. The Comments and Response Report will accompany the Final Amendment Report to be submitted to the Competent Authority for decision making.

### 2.3 ENVIRONMENTAL APPLICATIONS RELATED TO THIS PROJECT

COMPETENT AUTHORITY REFERENCE NUMBER	COMPETENT AUTHORITY	PURPOSE OF APPLICATION	TERRAMANZI REFERENCE NUMBER
Environmental Authorisation (dated 22/02/2012 with Ref: 12/12/20/1993/3)	National Department of the Environment, Forestry and Fisheries (DEFF)	Application for EA	NA
Environmental Authorisation Amendment (dated 4/02/2014 with Ref: 12/12/20/1993/3/AM1)	National Department of the Environment, Forestry and Fisheries (DEFF)	Extension of EA	130507
Environmental Authorisation Amendment (dated 8/02/2017 with Ref: 12/12/20/1993/3/AM2)	National Department of the Environment, Forestry and Fisheries (DEFF)	Extension of EA	160805
Environmental Authorisation Amendment (dated 13/02/2020 with Ref: 12/12/20/1993/3/AM3)	National Department of the Environment, Forestry and Fisheries (DEFF)	Extension of EA	191201
<b>Current Application for Amendment to the Environmental Authorisation</b> with Ref: 2021-03-0009	National Department of Forestry, Fisheries and the Environment (DFFE)	Turbine technical specification upgrade	201101

## 2.4 BRIEF OVERVIEW OF THE PROCESS

The **Amendment Process** can be broadly broken down into the following key phases. The process proposed is in keeping with the requirements stipulated in the EIA Regulations (GN No. R. 982 of 2014 (as amended)):



The phases highlighted in grey above illustrate the phases to be completed. The phases highlighted in orange are currently underway. The process is in keeping with the requirements stipulated in the NEMA EIA Regulations (2014, as amended). The application requirements as set out in Notice No.'s R. 982, R. 983, R. 984 and R. 985, promulgated in terms of Section 5 of the National Environmental Management Act (Act 107 of 1998) (as amended) and the requirements of the DFFE have been followed in the preparation of this Amendment Report.



## 2.5 AMENDMENT REPORT CONTENT

This document is the **Draft Amendment Report for Public Participation** and contains all information, which is necessary for an appropriate understanding of the project. It describes the scope of the assessment and the consultation process to be undertaken throughout the Amendment process.

In terms of Section 32 of GN. R982 (as amended), an Amendment Report, must include the information as specified in Table 1 below.

**Table 1:** Content of this Draft Amendment Report

Regulation	Scope and Content	Relevant Sections
<b>GNR 982 R32</b>	<b><i>The Applicant must submit within 90 days of the application for amendment, a report reflecting:</i></b>	
(1)(a)	(i) <i>An assessment of all impacts related to the change;</i>	Section 8
	(ii) <i>Advantages and disadvantages associated with the proposed change;</i>	Section 6, 7 & 11
	(iii) <i>Measures to ensure avoidance, management and mitigation of impacts associated with such proposed change; and</i>	Section 8 & 9
	(iv) <i>Any changes to the EMPr</i>	Section 9
	<b><i>which report -</i></b>	
	<i>(aa) had been subjected to a PPP process which had been agreed to by the CA and which was appropriate to bring the proposed change to the attention of potential and registered I&amp;APs including organs of state which have jurisdiction in respect of any aspect of the relevant activity and the CA, and</i>	Section 10 & Appendix D
	<i>(bb) reflects the incorporation of comments received, including any comments of the CA, or</i>	Will be included in the Final Amendment Report
(1)(b)	<i>a notification, in writing, that the report will be submitted within 140 days of receipt of the application by the CA as significant changes have been made or significant new information has been added to the report which changes, or information was not contained in the report consulted on during the initial PPP contemplated in sub regulation (1)(a) and that the revised report will be subjected to another PPP of at least 30 days.</i>	N/A



### 3 PROJECT DETAILS

#### 3.1 ENTITY RESPONSIBLE FOR DEVELOPMENT OF THE PROJECT

DETAIL	DESCRIPTION
Applicant Name:	South African Renewable Green Energy (Pty) Ltd.
Responsible Person:	Mr Pieter Francois Roux
Address:	P.O Box 4244
Contact Details:	Tel No:021 795 5240 Email: <a href="mailto:francois@sarge.co.za">francois@sarge.co.za</a>

#### 3.2 ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) DETAILS, EXPERTISE, AND INDEPENDENCE

In terms of NEMA (as amended), an independent environmental assessment practitioner must be appointed in terms of section 12 to 14 of the EIA Regulations. Terramanzi Group (Pty) Ltd (TMG) has been appointed to undertake this Application for Amendment of the EA on behalf of the Applicant.

Johann Kilian is the independent EAP responsible for this report. Johann is an environmental consultant with more than 7 years of experience in the environmental management industry. He is registered with SACNASP as a Professional Natural Scientist in the field of Earth Science. Johann holds a BSc in Earth Science as well as a BSc (Hons) in Geology from the University of Stellenbosch, and is a senior member of the Environmental Services Team at Terramanzi Group (Pty) Ltd.

Johann Kilian was assisted and supported on this project and the associated report writing by Evan Milborrow, who holds a BSc in Chemistry and Biochemistry, a BSc (Hons) and MSc in Molecular and Cell Biology from the University of Cape Town, and is a junior member of the Environmental Services Team at Terramanzi Group (Pty) Ltd.

This report was also reviewed by Fabio Venturi whose career spans over 19 years in the industry, across both the government and private sectors of the green economy. Fabio's entrepreneurial drive to innovate and influence has resulted in multiple industry firsts and awards. Fabio is an Accredited Professional with the GBCSA, a Certified Environmental Scientist, served on the South Africa Environmental Industry Body, that being the Western Cape Committee Branch of the South African Affiliate of the International Association for Impact Assessment (IAIAsa), and sat on the National Executive Committee (NEC) of IAIAsa, is a founding member of the Environmental Assessment Practitioner's Association of South Africa (EAPASA), and is a Certified Carbon Footprint Analyst and Energy Efficiency Auditor.

TMG hereby declares that they have no conflicts of interest related to the work of this report. Specifically, TMG declares that they have no personal financial interests in the property and/or activity being assessed in this report, and that they have no personal or financial connections to the relevant property owners, developers, planners, financiers or consultants of the property or activity, other than fair remuneration for professional services rendered for this report to the Competent Authority. TMG declares that the opinions expressed in this report are independent and a true reflection of their professional expertise.

TMG is a Level 4 Broad Based Black Economic Empowerment Company and is professionally accredited with several relevant industry bodies and is an authorised supplier on the Central Supplier Database (CSD), in line with the Preferential Procurement Policy Framework Act No. 5 of 2000 (PPPFA).

***Please refer to Appendix G for the EAP's Curriculum Vitae***

### 3.3 LOCATION OF ACTIVITY

The site is situated within the Ubuntu and Beaufort West Local Municipalities, straddling the Northern Cape and Western Cape Provinces (refer to Figure 3). An area of approximately 200 km<sup>2</sup>, located between the towns of Beaufort West (approximately 90km northeast) and Victoria West (approximately 40km south) is where the authorised WEF and associated infrastructure will be established (refer to Figure 4). The authorised WEF will be established on the remaining extent of the farm Modderfontein 228 and the farm Phaisantkraal 1. The project location has not been amended from the original authorisation by the Competent Authority. The site extent showing all farm boundaries is presented in Figure 5. The approved turbine locations for the Modderfontein WEF are presented in Figure 1.

GPS coordinates for centre-point of site: 31°44'54.53"S 23°16'18.27"E



Figure 3: Locality Map indicating the approximate site of the Modderfontein WEF in a regional context.





Figure 4: Locality Map indicating the approximate site of the Modderfontein WEF project.

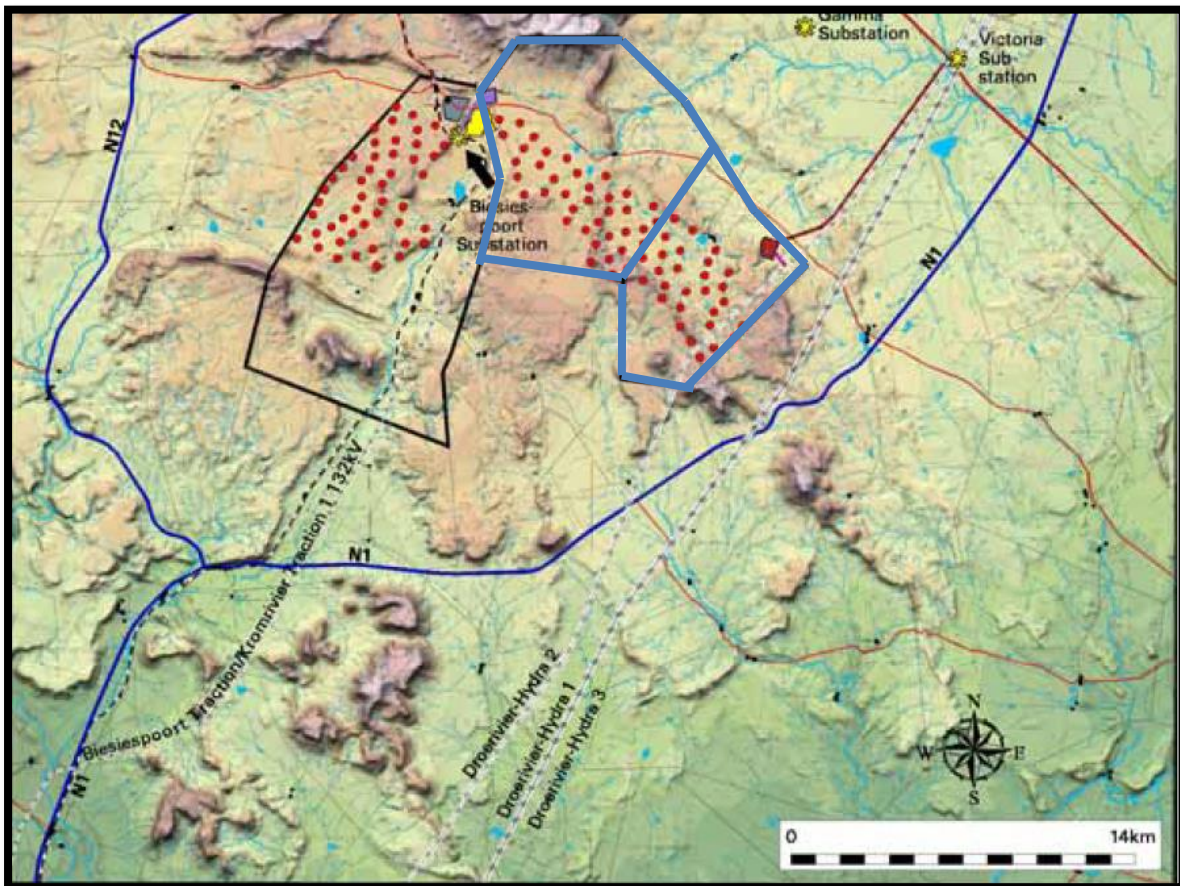


Figure 5: Site Detail Map of the Modderfontein WEF project, showing the site and separate farm boundaries (in blue) as well as the 67 original authorised turbine locations (Source: Karoo Final EIA by Savanah, 2011).

## 4 SCOPE OF THE PROPOSED AMENDMENT

### 4.1 DESCRIPTION OF PROPOSED AMENDMENTS

The Applicant wishes to amend the the authorised Modderfontein WEF located within the Ubuntu and Beaufort West Local Municipalities, in the Northern Cape and Western Cape Provinces. The proposed changes are outlined below:

#### 4.1.1 Amendment 1 (Substantive)

a. Amend the number of WTG in the environmental authorisation:

From: **Total WTG up to 67** To: **Total WTG up to 34**

b. Amend the rotor dimensions of the WTG in the environmental authorisation:

From: **Rotor dimensions 90 -110 m** To: **Rotor dimensions up to 162m**

c. Amend the hub height dimensions of the WTG in the environmental authorisation:

From: **Hub height: 80 -125m** To: **Hub height: 119m**

d. Amend the turbine rating of the WTG in the environmental authorisation:

From: **Turbine Rating 3 MW** To: **Turbine Rating up to 5.6 MW**

e. Amend the generation capacity of the WTG in the environmental authorisation:

From: **WEF Generation Capacity 201MW** To: **WEF Generation Capacity up to 190.4MW**

f. Amend the temporary laydown footprint of the WTG in the environmental authorisation:

From: **67 temporary WTG laydown areas (83750m<sup>2</sup>)** To: **34 temporary WTG laydown areas (81 600m<sup>2</sup>)**

g. Amend the number of concrete foundations of the WTG in the environmental authorisation:

From: **67 concrete foundations to support WTG** To: **34 concrete foundations to support WTG**

#### 4.1.2 Amendment 2 (Non-Substantive)

a. Issue individual environmental authorisations for two separate technical partners:

Mr. Rodrigo Garcia Parra  
Modderfontein (Pty) Ltd.  
33 Sillery Avenue  
Constantia, 7806  
Telephone Number: 071 300 5070  
Email Address: [rodrigo.garcia@elawan.co.za](mailto:rodrigo.garcia@elawan.co.za)

Mr Pieter Francois Roux  
South African Renewable Green Energy  
(Pty) Ltd.  
P.O Box 4244  
Telephone Number: 021 795 5240  
Email: [francois@sarge.co.za](mailto:francois@sarge.co.za)

##### **Cluster B**

25 WTG  
Generating capacity of up to 140 MW  
Steel tower up to 119m  
Rotor diameter up to 162m  
Turbine Rating up to 5.6MW  
25 temporary WTG laydown areas (60 000m<sup>2</sup>)  
25 concrete foundations for WTG (  
Internal roads (5m wide and 28km long)  
Underground cabling between the project  
components

##### **Cluster A**

9 WTG  
Generating capacity of up to 50.4 MW  
Steel tower up to 119m  
Rotor diameter up to 162m  
Turbine Rating up to 5.6MW  
9 temporary WTG laydown areas (21  
600m<sup>2</sup>)  
9 concrete foundations for WTG  
Internal roads (5m wide and 6km long)  
Underground cabling between the  
project components

**The following aspects must be included in both environmental authorisations as it will be shared:**

- A 132kV substation with high voltage yard footprints of approximately 100m X 100m (1000m<sup>2</sup>).
- One new overhead 132kV power lines of up to 1.5km in length, turning into the existing Droerivier/Hydra-2400kV line.
- Removal of a redundant land parcel, Portion 3 of the farm Noblesfontein 227 from the EA, as no development is currently authorised on this land parcel and not development is proposed over this land parcel.

**For ease of reference and for inclusion in the amended EAs, please see the full set of project components given on the following page.**



**Cluster B – EA to be held by Modderfontein (Pty) Ltd. C/O Mr. Rodrigo Garcia Parra**

- Up to 25 wind turbines with a total generating capacity of 140MW;
- Turbines with a total generating capacity of 5.6MW;
- Rotor diameter of each turbine will be up to 162m (i.e. each blade up to 81m in length);
- Each turbine will be a steel tower (between 80 and 119m in height);
- 25 temporary laydown areas of 80m x 30m (60 000m<sup>2</sup>);
- 25 concrete foundations to support the turbine towers (15m x 15m x 2.5m in depth);
- A 132kV substation with high voltage (HV) yard footprint of Approximately 100m x 100m (10 000m<sup>2</sup>);
- Underground cabling between project components;
- One new overhead 132kV power line of up to 1.5km in length, turning into the existing Droerivier/Hydra-2400 kV line; and
- Internal access roads (5m wide and 40km long) linking the wind turbines and the infrastructure on site.

**Cluster A – EA to be held by SARGE (Pty) Ltd. C/O Mr Pieter Francois Roux**

- Up to 9 wind turbines with a total generating capacity of 50.4MW;
- Turbines with a total generating capacity of 5.6MW;
- Rotor diameter of each turbine will be up to 162m (i.e. each blade up to 81m in length);
- Each turbine will be a steel tower (between 80 and 119m in height);
- 9 temporary laydown areas of 80m x 30m (60 000m<sup>2</sup>);
- 9 concrete foundations to support the turbine towers (15m x 15m x 2.5m in depth);
- A 132kV substation with high voltage (HV) yard footprint of Approximately 100m x 100m (10 000m<sup>2</sup>);
- Underground cabling between project components;
- One new overhead 132kV power line of up to 1.5km in length, turning into the existing Droerivier/Hydra-2400 kV line; and
- Internal access roads (5m wide and 40km long) linking the wind turbines and the infrastructure on site.

**All the conditions as listed in the original Environmental Authorisation, other than changes made as part of this amendment application, is still applicable to both amended Environmental Authorisations.**

#### **4.1.3 Amendment 3 (Substantive)**

a. Addition of an EMPr for the Modderfontein WEF

The previously approved Modderfontein WEF formed part of the Karoo Renewable Energy Facility, which included an EMPr, however no site specific EMPr exists for Modderfontein WEF. In compliance with Condition 13 of the approved EA the this amendment will include a site specific EMPr for the Modderfontein WEF which will include the mitigation measures contained in the Karoo Renewable Energy Facility EMPr, original EA for Modderfontein WEF as well as the mitigation measures as prescribed by the specialist reports as conducted as part of this amendment.

#### **4.1.4 Amendment 4 (Non-Substantive)**

a. Correction of applicable land parcels

Removal of a redundant land parcel, Portion 3 of the farm Noblesfontein 227 from the EA, as no development is currently authorised on this land parcel and not development is proposed over this land parcel.

## 4.2 DEVELOPMENT ALTERNATIVES

### **The Authorised/No-Go Alternative (status quo, 67 Turbines):**

This is the current status quo. i.e. it is not the “no development” alternative, but rather the permitted development alternative should the amendment not be successful:

- Up to 67 wind turbines (as indicated in the layout map included in Appendix I of the EIR dated January 2011) with a total generating capacity of up to 201MW using turbines with a generating capacity of up to 3MW;
- 30,06 ha of the proposed site will be permanently transformed for the installation of the turbines and related infrastructure;
- Each turbine will be a steel tower (between 80m and 125m in height), nacelle (gear box) and three rotor blades with a rotor diameter of between 90m and 110m (i.e. each blade up to 55m in length);
- 67 temporary turbine laydown areas of 50m X 25m (83750m<sup>2</sup>);
- 67 concrete foundations to support the turbine towers (15m X 15m X 2.5 m in depth);
- A 132kV substation with high voltage yard footprints of approximately 100m X 100m (1000m<sup>2</sup>);
- Underground cabling between the project components;
- One new overhead 132kV power lines of up to 1.5km in length, turning into the existing Droerivier/Hydra-2400kV line, and
- Internal access roads (5m wide and 40km long) linking the wind turbines and the infrastructure on the site.

### **The Preferred Alternative (34 WTG layout):**

This is the revised layout with reduced densities of WTGs.

- Up to 34 wind turbines with a total generating capacity of up to 190.4MW;
  - Each turbine with a generating capacity of 5.6MW;
  - Each turbine will be a steel tower up to 119m in height, nacelle (gear box) and three rotor blades with a rotor diameter up to 162m (ie. Each blade up to 81 m);
  - 34 temporary turbine laydown areas of 80m X 30m (81 600m<sup>2</sup>);
  - 34 Concrete foundations to support the turbine towers (15m X 15m X 2.5m in depth)
  - A 132kV substation with high voltage yard footprints of approximately 100m X 100m (1000m<sup>2</sup>);
  - Underground cabling between the project components;
  - One new overhead 132kV power lines of up to 1.5km in length, turning into the existing Droerivier/Hydra-2400kV line, and
  - Internal access roads (5m wide and 40km long) linking the wind turbines and the infrastructure on the site.
- 
- Administratively splitting the environmental authorisations to allow for the independent commercial operation of a Cluster A and a Cluster B for the site.
  - Removal of a redundant land parcel, Portion 3 of the farm Noblesfontein 227 from the EA, as no development is currently authorised on this land parcel and not development is proposed over this land parcel.

### 4.3 LISTED ACTIVITIES TRIGGERED

The listed activities which were originally triggered and authorised on the 22<sup>nd</sup> February 2012 are presented in Table 2 below with a full description of each activity provided in Table 3:

**Table 2:** Summary table of the Listed Activities Authorised for the Modderfontein WEF.

<b>GNR</b>	<b>GNR Date</b>	<b>Activity</b>	<b>Theme</b>
GNR 386	2006	Item 1 (m)	Construction near Watercourse
GNR 386	2006	Item 7	Storage of Dangerous Goods
GNR 386	2006	Item 12	Clearing of Vegetation
GNR 386	2006	Item 16 (b)	Transformation of vacant land
GNR 386	2006	Item 17	Phasing of activities
GNR 387	2006	Item 1 (a)	Generation of Electricity
GNR 387	2006	Item 1 (l)	Transmission of Electricity
GNR 387	2006	Item 2	Development of 20 ha or more

**Table 3:** Comprehensive list of Authorised listed activities, with full descriptions, for the Modderfontein WEF.

GNR	GNR Date	Activity	Description of Activity
386	2006	1 (m)	<i>The construction of facilities or including associated structures or infrastructure, for - (m) any purpose in the one in ten year flood line of a river or stream, or within 32 metres from the bank of a river or stream where the flood line is unknown, excluding purposes associated with existing residential use.</i>
386	2006	7	<i>The above ground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic metres but less than 1000 cubic metres at any one location or site.</i>
386	2006	12	<i>The transformation or removal of indigenous vegetation of 3 hectares or more or of any size where the transformation or removal would occur within a critically endangered or an endangered ecosystem listed in terms of section 52 of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).</i>
386	2006	16 (b)	<i>The transformation of undeveloped, vacant or derelict land to – (b) residential, mixed residential, commercial, industrial or institutional use where such development does not constitute infill and where the total area to be transformed is bigger than 1 hectare.</i>
386	2006	17	<i>Phased activities where any one phase of the activity may be below a threshold specified in this Schedule but where a combination of the phases, including expansions or extensions, will exceed a specified threshold.</i>
387	2006	1 (a)	<i>The construction of facilities or including associated structures or infrastructure, for – (a) the generation of electricity where –  (i) the electricity output is 20 megawatts or more; or  (ii) the elements of the facility cover a combined area in excess of 1 hectare.</i>
387	2006	1 (l)	<i>The construction of facilities or including associated structures or infrastructure, for –</i>

			<i>(l) the transmission and distribution of above ground electricity with a capacity of 120 kilovolts or more.</i>
387	2006	2	<i>Any development activity, including associated structures and infrastructure, where the total area of the developed area is, or is intended to be, 20 hectares or more.</i>

The current (similar) listed activities triggered by the proposed amendment include:

**Table 4:** Summary table of the Similar Listed Activity(ies) (NEMA, 2017) for all Listed Activities Authorised (2012) for the Modderfontein WEF.

Listing Notice	Authorised Activity			Similar Listed Activity		
	GNR	GNR Date	Activity	GNR	GNR Date	Activity
1	386	2006	1 (m)	327	2017	19
1	386	2006	7	327	2017	14
1	386	2006	12	327	2017	27
1	386	2006	16 (b)	327	2017	28
1	386	2006	17	327	2017	67
2	387	2006	1 (a)	325	2017	1
2	387	2006	1 (l)	325	2017	9
2	387	2006	2	325	2017	15

**NOTE: This is an Amendment Application Report for an authorised development and there are no new activities triggered.**

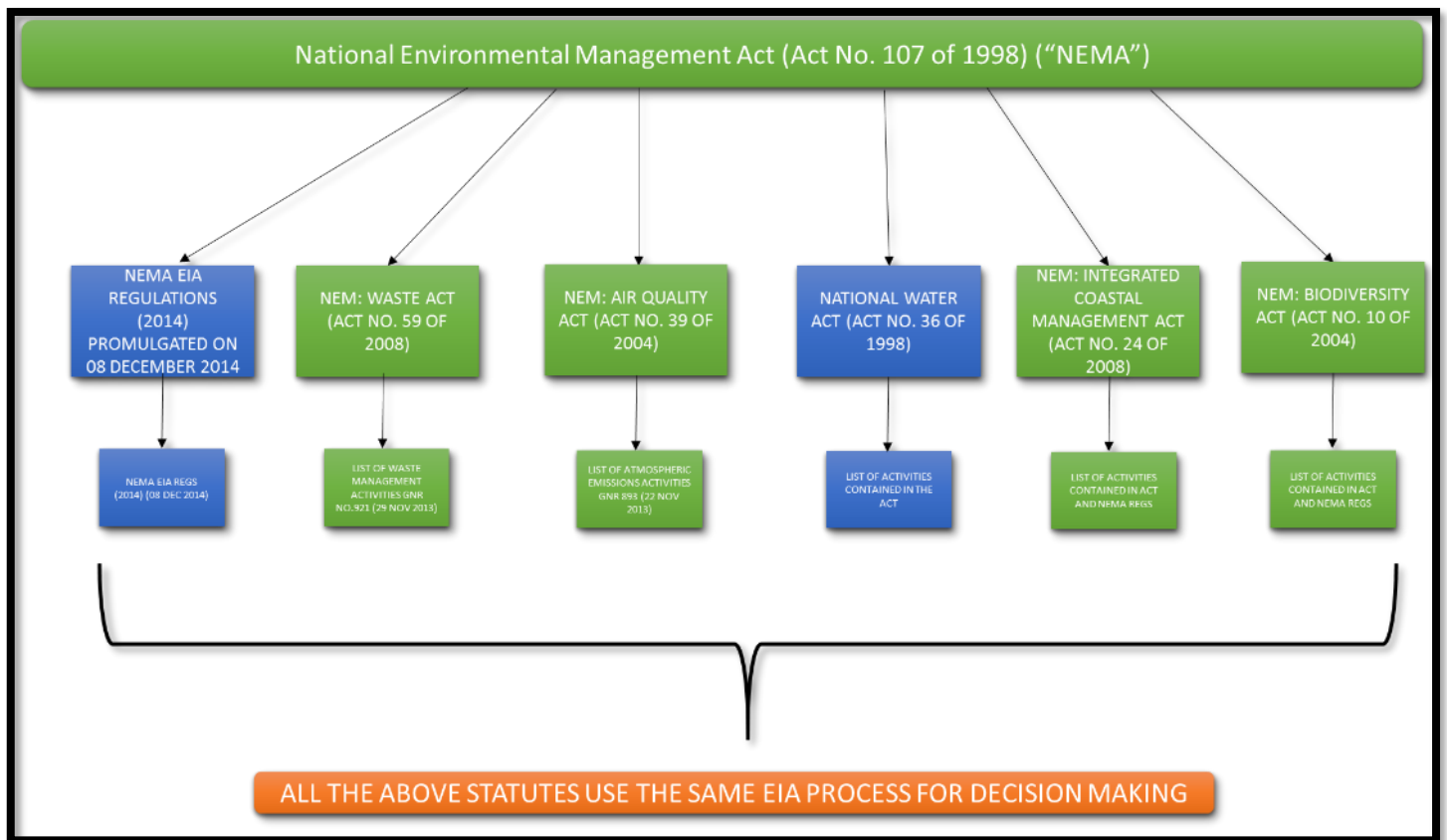


## 5 LEGISLATIVE CONTEXT

The Amendment triggers the following National Statutes:

- National Environmental Management Act (Act No. 107 of 1998) and the NEMA EIA Regulations (2014, as amended)

The different sets of legislative requirements are housed under the National Environmental Management Act (Act No. 107 of 1998) as amended and illustrated below. The proposed amendments to the Environmental Authorisation will only trigger the National Environmental Management Act (Act No. 107 of 1998) (as amended) and the NEMA EIA Regulations (2014, as amended), resulting in an Amendment Process to be undertaken.



**Figure 6:** Illustration of the one Environmental Authorisation Process in terms of the NEMA.

### **NEMA EIA Regulations (2014, as amended)**

- The NEMA EIA Regulations (2014) were published on 08 December 2014 and have undergone various amendments and deal with activities that may have an impact on the environment.
- The National Department of Forestry, Fisheries and the Environment (DFFE) is the Competent Authority.

**Requirements of a Part 2 Substantive Amendment Process**

Regulation 31 of the NEMA EIA Regulations (2014, as amended) states that:

*“An environmental authorisation may be amended by following the process prescribed in this Part if the amendment will result in a change to the scope of a valid environmental authorisation where such change will result in an increased level or nature of impact where such level or nature of impact was not –*

- (a) assessed and included in the initial application for environmental authorisation; or*
- (b) taken into consideration in the initial environmental authorisation;*

*and the change does not, on its own, constitute a listed or specified activity.”*

The Applicant therefore wishes to apply for a substantive amendment to the EA issued, in terms of Regulation 31 and 32 of the NEMA EIA Regulations (2014, as amended). As per sub-regulation 31(a), the proposed application for the amendments as listed in section 4.1 were not considered as part of the initial EIA process undertaken, therefore these potential impacts need to be assessed according to the change in level or nature of impact.

## 6 MOTIVATION FOR NEED AND DESIRABILITY FOR THE ACTIVITY

The need and desirability of the authorised WEF has already been thoroughly assessed and approved; therefore, the nature and scope of this amendment application does not require a comprehensive assessment of need and desirability. However, the historical motivation is included below for thoroughness and ease of reference.

### **Historical Motivation**

This section outlines the purpose of considering the activity “need” and “desirability” in accordance with the National Environmental Management Principles in terms of NEMA which serve as a guide for the interpretation, administration, and implementation of NEMA and the NEMA EIA regulations (2014, as amended).

The National Environmental Management Principles specifically *inter alia* require the following:

- *“Environmental Management must place people and their needs at the forefront of its concern” and equitably serve their interests;*
- *“Environmental Management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option;*
- *“Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person”;*
- *“Decisions must take into account the interests, needs and values of all interested and affected parties”;* and
- *“The Environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage”.*

### **Motivation for the proposed amendment**

The amendment to the authorised WEF is based on changes and improvements in the technologies employed for wind energy facilities. As such, should the amendment not be granted, the latest, most efficient wind energy technologies will not be available to the developer for implementation as part of the Renewable Energy Independent Power Producer Procurement Programme (REIPPP). This could mean that the applicant would need to install the original number of turbines as opposed to installing less turbines with the newer turbine technology. This will result in a loss of the WEF’s efficiency.

Need and desirability should be considered in the context of **sustainable development** which speaks to social, economic, and environmental considerations and takes a long-term strategic view to environmental management.

Please note that the Modderfontein WEF has already been authorised by the Department of Environmental Affairs on 22 of February 2012 (DEA Ref: 12/12/20/1993/3) and therefore the general need and desirability of the activity has been approved by the CA.

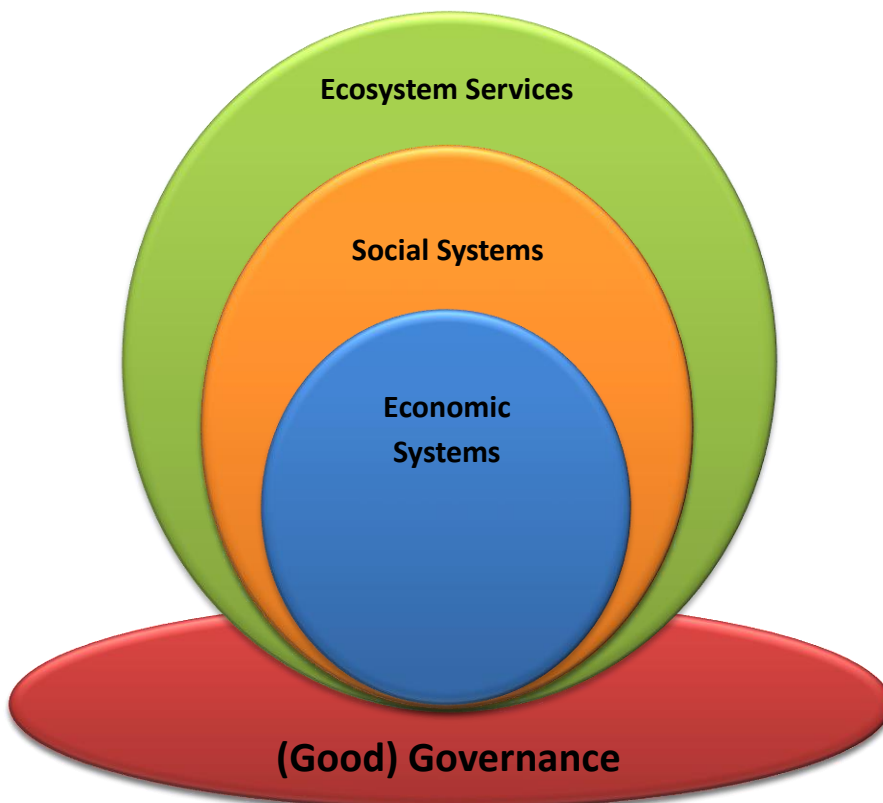
Further, the proposed amendment **does not warrant any additional considerations in terms of the need and desirability** of the project as the WEF will occur within the already authorised development footprint and the proposed changes are deemed acceptable by the professional team of independent specialists.

## 6.1 SUSTAINABLE DEVELOPMENT

Sustainable development is best summarised by an extract from the United Nations World Commission on Environment and Development and reads as follows:

*"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs... As such it requires the promotion of values that encourage consumption standards that are within the bounds of the ecologically possible and to which all could reasonably aspire."*

(Our Common Future, WCED, 1987)<sup>2</sup>.



The widely accepted interdependence model of sustainability recognises that social and economic systems **have never been and can never be independent of the natural system.**

This model further supports the belief that **interactions** between and within component systems will result in **feedback** throughout the system

**Endorsed** by the National DFFE

(Mebratu, 1998)

**Although already undertaken during the previous EIA process, it was thus important that the Impact Assessment Phase carefully considered and assessed the broad principles of sustainable development in order to clearly demonstrate the “need and desirability” of the authorised WEF in the context of NEMA.**

<sup>2</sup>United Nations. 1987. ["Report of the World Commission on Environment and Development."](#) General Assembly Resolution 42/187, 11 December 1987



## 6.2 MODDERFONTEIN WEF NEED AND DESIRABILITY SUMMARY

The general need and desirability of the activity has already been motivated for and agreed to by the DEA through the Environmental Authorisation (with DEA Ref: 12/12/20/1993/3) issued for the project on 22/02/2012, and a summary (as extracted from the previous environmental impact assessment report completed in 2011) is provided below for ease of reference:

*“The primary motivation behind the development of the proposed Karoo Renewable Energy Facility is the contribution of additional capacity to the national electricity grid and to assist in achieving the goal of a 30% share of all new power generation being derived from Independent Power Producers (IPPs), as targeted by the Department of Energy (DoE). South Africa’s electricity supply remains heavily dominated by coal-based power generation. To date, South Africa has failed to exploit the various gains which the renewable energy industry offers, and the country’s significant renewable energy potential remains largely untouched.*

*It is considered viable that long-term benefits for the community and/or society in general can be realised should the site identified prove to be acceptable from a technical and environmental perspective for the establishment of the proposed renewable energy facility. The Karoo Renewable Energy Facility has the potential to contribute to local electricity supply and to increase the security of supply to consumers. In addition, it may provide both economic stimulus to the local economy through the construction process and long term employment (i.e. management and maintenance) during the operation phase.”*

The motivation above addresses the broader need and desirability for the WEF in the area and the proposed amendment does not change the context of the above and therefore the motivation remains as is.

## 7 MOTIVATION FOR THE PROPOSED AMENDMENTS TO THE MODDERFONTEIN WEF

This section provides a concise motivation for the requested amendment to the Environmental Authorisation for the Modderfontein WEF.

### 7.1 PROPOSED AMENDMENT: CHANGE IN TURBINE SPECIFICATIONS

Following developments in technology after the issuing of the original EA, the developer would like to install a WTG technology on the site which is best suited to the conditions on the site. These amendments are proposed to increase the efficiency of the facility and consequently the economic competitiveness thereof, in turn, reducing the electricity tariffs to be charged by the facility which would benefit electricity consumers at large.

The proposed amendment includes the following:

- Reduction in the number of turbines from 67 to 34.
- Increase in the individual turbine rating from up to 3MW to up to 5.6MW.
- Increasing the WTG dimensions of up to 119m of hub height and up to 162m of rotor diameter, with a total of up to 81 m blade length.
- Total WEF generation capacity reduced from 201MW to 190.4MW.
- 34 temporary turbine laydown areas of 80m X 30m (81 600m<sup>2</sup>).
- 34 Concrete foundations to support the turbine towers (15m X 15m X 2.5m in depth)
- A 132kV substation with high voltage yard footprints of approximately 100m X 100m (1000 m<sup>2</sup>);
- Underground cabling between the project components;
- One new overhead 132kV power lines of up to 1.5km in length, turning into the existing Droerivier/Hydra-2400kV line, and
- Internal access roads (5m wide and 40km long) linking the wind turbines and the infrastructure on the site.
- Administratively splitting the environmental authorisations to allow for the independent commercial operation of a Cluster A and a Cluster B for the site.
- Removal of a redundant land parcel, Portion 3 of the farm Noblesfontein 227 from the EA, as no development is currently authorised on this land parcel and not development is proposed over this land parcel.

The proposed number of WTG was decreased in order to ensure the impact of the new larger WTG does not exceed the original authorised level of impact as far as practicably possible.

**The changes in the turbine specifications do not trigger any new listed activities.**

## 8 IMPACT ASSESSMENT OF THE PROPOSED AMENDMENTS

### 8.1 SUMMARY OF SPECIALIST STUDY FINDINGS FOR THE PROPOSED AMENDMENTS

The following Independent Specialist Studies were undertaken during the original Environmental Impact Assessment Process (completed in 2011) for the establishment of the Modderfontein WEF which was subsequently authorised by the Competent Authority on 22 February 2012:

- Ecological Study – David Hoare Consulting cc (C/O David Hoare, March 2011)
- Avian Impact assessment – Avisense Consulting (C/O Andrew Jenkins March 2011)
- Geological Report – Outeniqua Geotechnical Services Civil Laboratories (C/O Ian Paton, March 2011)
- Archaeological Impact Assessment– Department of Archaeology, Rhodes University (C/O Dr. Johan Binneman, Ms Celeste Booth and Ms Natasha Higgitt, March 2011)
- Palaeontological Desktop Assessment – (C/O L. Rossouw, March 2011)
- Visual Impact Assessment – MetroGIS (C/O Lourens du Plessis, March 2011)
- Noise Impact Study – M2 Environmental Connections cc (C/O M. de Jager, March 2011)
- Social Impact Assessment – Batho Earth (C/O Ingrid Snyman, March 2010)

These original Specialist reports (2011) can be found in Appendix C2.

Further to the above, the above Specialists were consulted as part of this current amendment process to ascertain if the proposed amendments to the WEF would result in additional impacts on the site and its surroundings.

The following Specialists confirmed that the proposed amendment **will not have any significant changes to their original impact ratings** (completed for the previous EIA in 2011) and therefore no additional assessments are required to supplement this Amendment Report:

- Agro-Ecosystems Assessment– AGRInformatics Natural Resource Specialists (C/O Francois Knight, July 2021)
- Town Planning – Warren Petterson Planning (C/O Andries du Plessis, June 2021)
- Traffic Impact Assessment – Innovative Transport Solutions (C/O Christoff Krogscheepers, June 2021)
- Noise Impact Report – dBAcoustics (C/O BJB van der Merwe, July 2021)

**Specialist report verification statements (dated 2021) to support the above-listed specialist study findings can be viewed in Appendix C3 attached to this Amendment Report.**

The following Specialists confirmed that the proposed amendment (change in technical specification of turbines) **may affect their original impact ratings** (completed for the previous EIA in 2011) and therefore require an updated assessment for their following studies (to supplement this Amendment Report):

- Aquatic Specialist Study – Blue Science Pty Ltd (C/O Antonia Belcher, June 2021)
- Avifaunal Impact Assessment – Chris van Rooyen Consulting (C/O Chris van Rooyen, June 2021)
- Visual Impact Assessment – Environmental Planning and Design (C/O Jon Marshall, June 2021)
- Terrestrial Ecology – Nick Helme Botanical Surveys (C/O Nick Helme, June 2021)
- Bat Specialist Report – Arcus Consultancy Services South Africa Pty Ltd (C/O Michael Brits and Mark Hodgson, June 2021)
- Heritage Impact Assessment – CTS Heritage (C/O Jenna Lavin, June 2021)
- Archaeological Specialist Study – CTS Heritage (C/O Jenna Lavin, May 2021)
- Palaeontological Specialist Assessment – CTS Heritage (C/O Jenna Lavin, June 2021)
- Social Impact Assessment – Batho Earth (C/O Ingrid Snyman, July 2021)

**The updated specialist studies (completed in June/July 2021) in support of the above listed studies are attached as Appendix C1 to this Amendment Report.**

**Table 5:** Summary Table of all Specialist reports conducted for the Modderfontein WEF and included in this report. Updated specialist reports are indicated in Yellow, while Specialist Verification Letters for reports unaffected by the proposed amendment are indicated in Blue.

<b>Impact</b>	<b>Specialist</b>	<b>Original Assessment (Appendix C2)</b>	<b>Report Updated (Appendix C1)</b>	<b>Verification of Original Report (Appendix C3)</b>
Ecological Study	David Hoare Consulting cc C/O David Hoare	March 2011	NA	NA
Avian Impact assessment	Avisense Consulting C/O Andrew Jenkins	March 2011	NA	NA
Geological Report	Outeniqua Geotechnical Services Civil Laboratories C/O Ian Paton	March 2011	NA	NA
Archaeological Impact Assessment	Department of Archaeology, Rhodes University C/O Dr. Johan Binneman, Ms Celeste Booth and Ms Natasha Higgitt	March 2011	NA	NA
Palaeontological Desktop Assessment	C/O L. Rossouw	March 2011	NA	NA
Visual Impact Assessment	MetroGIS C/O Lourens du Plessis	March 2011	NA	NA
Noise Impact Study	M2 Environmental Connections cc C/O M. de Jager	March 2011	NA	NA
Social Impact Assessment	Batho Earth C/O Ingrid Snyman	March 2011	NA	NA
Aquatic Specialist Study	Blue Science Pty Ltd C/O Antonia Belcher	NA	June 2021	NA
Avifaunal Impact Assessment	Chris van Rooyen Consulting C/O Chris van Rooyen	NA	June 2021	NA
Agro-Ecosystems Assessment	AGRIinformatics Natural Resource Specialists C/O Francois Knight	NA	NA	July 2021
Noise Impact Report	dBAcoustics C/O BJB van der Merwe	NA	NA	July 2021
Visual Impact Assessment	Environmental Planning and Design C/O Jon Marshall	NA	June 2021	NA
Terrestrial Ecology	Nick Helme Botanical Surveys C/O Nick Helme	NA	June 2021	NA
Bat Specialist Report	Arcus Consultancy Services South Africa Pty Ltd C/O Michael Brits and Mark Hodgson	NA	June 2021	NA
Heritage Impact Assessment	CTS Heritage C/O Jenna Lavin	NA	June 2021	NA
Archaeological Specialist Study	CTS Heritage C/O Jenna Lavin	NA	May 2021	NA

Palaeontological Specialist Assessment	CTS Heritage C/O Jenna Lavin		June 2021	
Social Impact Assessment	Batho Earth C/O Ingrid Snyman	NA	July 2021	NA
Town Planning	Warren Petterson Planning C/O Andries du Plessis	NA	NA	June 2021
Traffic Impact Assessment	Innovative Transport Solutions C/O Christoff Krogscheepers	NA	NA	June 2021

### 8.1.1 Aquatic Specialist Study Findings

The independent specialist Blue Science Pty Ltd (C/O Antonia Belcher) (hereinafter referred to as the “Aquatic Specialist”) was appointed to undertake the Aquatic Specialist Study for the proposed amended layout to determine the impacts thereof.

The Aquatic Specialist response pertaining the proposed amendments is as follows:

*The aquatic features within the study area consist of the upper reaches of the Brak, Gabrielspruit, Tierhoekspruit and Kareespruit Rivers and their smaller, unnamed tributaries, as well as some valley bottom wetlands associated with the larger watercourses. The ecological habitat integrity of the rivers within the study area is still natural in the upper reaches with few modifications. Downstream, the larger rivers are largely natural to moderately modified by the surrounding activities. The valley bottom wetlands associated with the river have been modified but are still in a largely natural ecological condition. In terms of biodiversity importance, the study area is located within an Upstream River Freshwater Ecosystem Priority Area. The watercourses are mapped as aquatic ESAs.*

*The recommended ecological condition of the aquatic features in the area would be that they remain in their current ecological condition and should not be allowed to degrade further. The recommended buffer area between the aquatic features and the project components to ensure these aquatic ecosystems are not impacted by the proposed activities is as follows:*

- *Smaller streams and drainage lines, together with their seeps: at least 50 m from the centre of these streams; and*
- *The larger rivers within the valley floor, together with their valley bottom wetlands: at least 100 m, measured from the top of bank of the river channels or the delineated wetland edge.*



*With mitigation, the potential freshwater impacts of the proposed amended Modderfontein WEF for the construction, operation and decommissioning phases are likely to be low. One can also expect that the cumulative impact of the proposed project would not be significant provided mitigation measures are implemented. Recommended mitigation measures to be included in the environmental authorisation are as follows:*

- The existing road infrastructure should be utilised as far as possible to minimise the overall disturbance created by the proposed project. Where new roads need to be constructed, the existing road infrastructure should be rationalised and any unnecessary temporary roads decommissioned and rehabilitated to reduce the disturbance of the area and within the river beds. For new roads to the turbines, these should be located at least 100m outside of the drainage/riverbeds. Where access routes need to be constructed through the watercourses, the disturbance of the channels should be limited. Wetland areas should be avoided and any road adjacent to a wetland feature should also remain outside of the 50m buffer zone.*
- All crossings over watercourses should be such that the flow within the drainage channel is not impeded and should be constructed perpendicular to the river channel, where possible based on the contours.*
- Any indigenous vegetation clearing within or adjacent to the watercourses should occur in a phased manner to minimise erosion and/or run-off. An Environmental Control Officer or a specialist with knowledge and experience of the local flora, should be appointed during the construction phase to be able to make clear recommendations with regards to the revegetation of disturbed areas.*
- During the construction phase, site management must be undertaken at the laydown area, batching plant and the individual turbine construction areas. This should specifically address on-site stormwater management and prevention of pollution measures from any potential pollution sources during the construction activities such as hydrocarbon spills. Any stormwater that does arise within the construction sites must be handled appropriately to trap sediments and reduce flow velocities.*
- Any disturbed areas should be rehabilitated and monitored to ensure that these areas do not become subject to erosion or invasive alien plant growth.*
- Invasive alien plant growth and signs of erosion should be monitored on an ongoing basis to ensure that the disturbed areas do not become infested with invasive alien plants.*
- Stormwater run-off infrastructure must be maintained to mitigate both the flow and water quality impacts of any stormwater leaving the WEF site. No stormwater runoff must be allowed to discharge directly into the watercourses. The runoff should rather be dissipated over a broad area covered by natural vegetation or managed using appropriate channels and swales when located within steep embankments. Should any erosion features develop, they should be stabilised as soon as possible.*
- Any water supply, sanitation services as well as solid waste management services that should be required for the site should preferably be provided by an off-site service provider.*
- During decommissioning, disturbance to the freshwater ecosystems should be limited as far as possible. Disturbed areas may need to be rehabilitated and revegetated. Mitigation and follow up monitoring of residual impacts (alien vegetation growth and erosion) may be required.*

*The risk assessment determined that the proposed development of the Modderfontein WEF poses a low risk of impacting aquatic habitat, water flow and water quality. With these findings of the risk assessment, the water use activities associated with the proposed project could potentially be authorised by means of the general authorisations for the Section 21(c) and (i) water uses. A Water Use Licence (WUL) may however be required for the abstraction of water for the WEF which would require that an application for a WUL be submitted to the Department of Water and Sanitation (DWS) for the entire project-related activities.*

*The No-go Alternative implies that the original Environmental Authorisation of up to 67 turbines would be constructed. This would entail more disturbance than the proposed amended up to 34 turbines. One could thus expect that the amended WEF layout would have less of a potential aquatic ecosystem impact than that of the No Go Alternative.*

*Based on the above findings, there is no reason from an aquatic ecosystem perspective, why the proposed activity (with the implementation of the above-mentioned mitigation measures) should not be authorized. The revised layout has further reduced any potential impacts to the aquatic ecosystems in the area and thereby has improved the acceptability of the proposed WEF from an aquatic ecosystem point of view.*

Based on the information presented by the Aquatic Specialist, the presented amendments are acceptable and implementable, providing that the prescribed mitigation measures are implemented.

**There is therefore no evidence that the proposed amendment should not be granted.**

### 8.1.2 Avifaunal Impact Assessment Findings

The independent specialist Chris van Rooyen Consulting (C/O Chris van Rooyen) (hereinafter referred to as the “Avifaunal Specialist”) was appointed to undertake the Avifaunal Impact Assessment for the proposed amended layout to determine the impacts thereof.

The Avifaunal Specialist response pertaining the proposed amendments is as follows:

*Given the potential changes to the turbine specifications and quantity, a re-assessment of the potential turbine collision impact was carried out for purposes of the proposed amendment, to establish (i) if the original pre-mitigation risk assessment rating by Avisense (2011) is still valid in light of a decade of subsequent experience, and (ii) if the original mitigation measures need to be revised to reduce post-mitigation impact rating to Low, i.e. to acceptable levels.*

*The Preferred Alternative amounts to a 49% reduction in the number of turbines, and a 17% reduction in total rotor swept area. However, given the proximity of five (5) confirmed Verreaux’s Eagles nests within 5.2km of the proposed development, and the benefit of a decade of experience gained since the original assessment was conducted in 2011, it is concluded that the original pre-mitigation impact significance rating of Medium-High for the collision risk that the No-Go Alternative (67 turbines) pose to avifauna was too low, and should have been High – Very High. The pre-mitigation rating of the Preferred Alternative (34 turbines) is still Medium - High.*

*It is further concluded that the recommendations formulated by Avisense (2011), which are incorporated in the EA, remain valid for the Preferred Alternative, but need to be supplemented for the post-mitigation rating to be reduced to Low. The following additional mitigation measures are proposed:*

- 1. All the turbines should have one blade painted black or red (depending on which colour is approved by the Civil Aviation Authority) for two thirds from the tip of the blade. This implies that the developer will have to engage with turbine manufacturers to come up with a design that will comply with all relevant industry and aviation standards.*
- 2. No turbines should be constructed within a 3.7km circular buffer zone around any Verreaux’s Eagle nest. This has already been implemented in the Preferred Alternative (see Figure 3).*
- 3. Turbines in the circular 5.2km medium-risk buffer zone should be reduced to an absolute minimum. Any turbines remaining in the Verreaux’s Eagle 5.2km medium-risk circular buffer zones should be subject to pro-active mitigation in the form of a proven mitigation method such as Shutdown on Demand (SDoD), using either biomonitors or an automated system such as IdentiFlight.*

*The Preferred Alternative is a significant improvement on the No-Go alternative as far as impacts and avifauna is concerned and should reduce the expected pre-mitigation impacts from High to Very High for the No-Go Alternative to Medium to High for the Preferred Alternative. However, additional mitigation measures are required to reduce the post mitigation impacts of the Preferred Alternative to Low, i.e. to acceptable levels.*

*The proposed amendment is supported from an avifaunal impact perspective, provided the additional mitigation measures proposed in this report are implemented.*

Based on the information presented by the Avifaunal Specialist, the presented amendments are acceptable and implementable, providing that the prescribed mitigation measures are implemented.

**There is therefore no evidence that the proposed amendment should not be granted.**

### 8.1.3 Agro-Ecosystems Assessment Findings

The independent specialist AGRinformatics Natural Resource Specialists (C/O Francois Knight) (hereinafter referred to as the “Agricultural Specialist”) was appointed to undertake the Agro-Ecosystems Assessment for the proposed amended layout to determine the impacts thereof.

The Agricultural Specialist response pertaining the proposed amendments is as follows:

*The limitations of the agricultural resources of the study area as mentioned in the original EIR, have been confirmed, as outlined above. The reduction in the number of wind turbines, from the approved 67 to the proposed 34 will have a proportionately lower footprint and thus similarly reduced impact on the agro-ecosystems.*

*The new turbine layout is regarded as more favourable from an agro-ecological point of view, as it is mostly confined to the ridgelines of the hills, where the soils are rocky or very shallow and thus contributes marginally to the grazing capacity of the land.*

*In terms of the guidelines of the Protocol, the Modderfontein WEF with a total generating capacity of 190.4 MW, has potentially up to 476 ha available for the development footprint of the facility, including roads and all related infrastructure. The total surface area of all access roads and hard standing areas of the proposed amended WEF amounts to ±80 ha.*

#### **Conclusion**

*The proposed amended Modderfontein WEF will have a reduced footprint relative to the no-go alternative and the turbine positions are more favourably placed compared to the no-go alternative. The total footprint amounts to less than 20% of the maximum allowable development footprint of 2.5 ha per MW generating capacity. The potential impact of the amended plan on the agro-ecosystem is therefore lower than that of the previously authorised alternative and regarded as negligible to the agro-ecological receiving environment.*

*I trust that these findings address your requirement in terms of the Part 2 Amendment Application.*

Based on the information presented by the Agricultural Specialist, the presented amendments are acceptable and implementable, providing that the prescribed mitigation measures are implemented. **No additional impacts or mitigation measures were identified.**  
**There is therefore no evidence that the proposed amendment should not be granted.**

#### 8.1.4 Noise Impact Report Findings

The independent specialist dBAcoustics (C/O BJB van der Merwe) (hereinafter referred to as the “Noise Specialist”) was appointed to undertake the Noise Impact Report for the proposed amended layout to determine the impacts thereof.

The Noise Specialist response pertaining the proposed amendments is as follows:

*The noise level from the proposed “new” wind turbines will be 106.4dBA at a height of 119m. The threshold value of 7.0dBA (Western Cape Noise Control Regulations, 2013) will not be exceeded during the day and/or night- time periods.*

*There will be a shift in the prevailing ambient noise level in the immediate vicinity of the wind turbines but at a distance exceeding 500m from the wind turbine the intrusion level will be minimal and in line with the Western Cape Noise Control Regulations, 2013. The wind noise will create the predominant ambient noise level at the noise receptors which will mask the noise from the wind turbines. People who may work or visit the wind turbine will experience an increase in the prevailing ambient noise level in the vicinity of the wind turbines. The increase at the residential properties will be insignificant (on the occupants of the farmhouses and animals).*

*The prevailing ambient noise levels are largely created by emissions from a combination of noise sources of which the main source is wind noise and the wind turbines can only operate when the wind is blowing. The large variations in the meteorological conditions and the geographical relations between the wind turbine positions and the noise sensitive receptors allow for the decrease in the noise as it propagates from the wind turbines.*



*The following conditions as per original authorisation (DEA Reference Number 12/12/20/1993/3) will still be applicable and adhered to:*

- 1. Construction staff must be trained to minimise noise impacts;*
- 2. The holder of this authorisation must ensure that the National Control Regulations and SANS 10103:2008 are adhered to and reasonable measures to limit noise from the work site are implemented;*
- 3. The holder of this authorisation must ensure that the construction staff working in areas where the 8-hour ambient noise levels exceed 75.0dBA must wear ear protection devices;*
- 4. The holder of this authorisation must ensure that all equipment and machinery are well maintained and equipped with silencers;*
- 5. The holder of this authorisation must provide a warning to the community when noisy activity e.g. blasting is to take place;*
- 6. All noisy construction operations should only occur during daylight hours;*
- 7. All wind turbines must be located at a set-back distance of 500m from any homestead and a day/night noise criteria level at the nearest residents of 45.0dBA should be used to locate the turbines. The 500m setback distance can be relaxed if local factors; such as high ground between the noise source and the receiver, indicates that a noise disturbance will not occur;*

Based on the information presented by the Noise Specialist, the presented amendments are acceptable and implementable, providing that the prescribed mitigation measures are implemented. **No additional impacts or mitigation measures were identified.**  
**There is therefore no evidence that the proposed amendment should not be granted.**

### 8.1.5 Visual Impact Findings

The independent specialist Environmental Planning and Design (C/O Mr Jon Marshall) (hereinafter referred to as the “Visual Specialist”) was appointed to undertake the Visual Impact Assessment to determine the visual impact of the proposed amendment.

The Visual Specialist’s findings pertaining to the proposed Amendment is as follows:

*Whilst the proposed turbine layout extends over a similar section of the landscape, because it includes fewer turbines, the development footprint is significantly smaller.*

*Even though the proposed turbine structures are taller than the authorised, because they are positioned over a similar extent of the landscape as the turbines associated with the authorised layout, they may be slightly more obvious over a greater distance but their ZTV generally falls within the ZTV of the authorised project.*

*The review indicates that the proposed amendment to the layout and turbine specification will not increase levels of visual impacts assessed by the original VIA.*

*Therefore, from a visual impact perspective, there is no reason why the proposed amendment to the Modderfontein WEF should not be authorised.*

Based on the information presented by the Visual Specialist, the presented amendments are acceptable and implementable, providing that the prescribed mitigation measures are implemented. **No additional impacts or mitigation measures were identified.**  
**There is therefore no evidence that the proposed amendment should not be granted.**

### 8.1.6 Ecological Impact Findings

The independent specialist Nick Helme Botanical Surveys (C/O Mr Nick Helme) (hereinafter referred to as the “Ecological Specialist”) was appointed to compile the Ecological Impact Assessment undertaken for the Modderfontein WEF.

The Ecological Specialist response pertaining to the proposed amendments is as follows:

- *The study area is currently mapped as an Ecological Support Area (ESA) and Other Natural Area (ONA) in terms of the Western and Northern Cape Spatial Biodiversity Plans. No Critical Biodiversity Areas (CBAs) are mapped from within the project area.*
- *No plant Species of Conservation Concern were recorded in the study area by Hoare (2011).*
- *The Critically Endangered Riverine Rabbit is not likely to be significantly impacted by the proposed project (with only about 1.5km of new roads through the preferred habitat), although it is likely to occur in the project area.*
- *Two Near Threatened reptiles (Braack’s Pygmy Gecko and Karoo Dwarf Tortoise) are likely to occur in the study area and may be impacted by the proposed turbines, roads and cabling. The former is largely restricted to rocky outcrops while the latter is more wide ranging.*
- *The amended proposal will have an approximately 50% smaller overall footprint than the approved layout, and thus the amended layout is likely to have a lower botanical and faunal impact than the authorised layout overall, but the amended layout still has a significant negative botanical impact, which cannot be mitigated to a level below Medium negative.*
- *All mitigation and EMP requirements outlined in Hoare (2011) should also be required for the amended layout, if authorised.*
- *Additional mitigation required is as follows:*
  - *During construction all cable trenches should be closed up as soon as possible, and the ECO must survey all open trenches three times a day and remove any animals that have fallen into these trenches.*
  - *Roads, turning areas and cable trenches must avoid all rocky outcrops, and where this is not possible impact on outcrops must be minimised.*
  - *All turbine, cable and road construction through rocky areas should be preceded and accompanied by surveys for all fauna, and especially of relatively slow moving species such as tortoise and geckos, and these should be immediately translocated to similar habitat out of harms way.*

Based on the information presented by the Ecological Specialist, the presented amendments are acceptable and implementable, providing that the prescribed mitigation measures are implemented.

**There is therefore no evidence that the proposed amendment should not be granted.**

### 8.1.7 Bat Impact Findings

The independent specialist Arcus Consultants (C/O Ashlin Bodasing) (hereinafter referred to as the “Bat Specialist”) was appointed to review the Bat Impact Assessment undertaken for the authorised Modderfontein WEF to determine the impact of the proposed amendment.

The Bat Specialist findings pertaining to the WEF amendment development as follows:

*Potential bat mortality is directly associated with collisions (with spinning turbine blades and transmission lines) and barotrauma, and indirectly through the modification of habitats.*

*As per the existing EA, the rotor swept area for each turbine will be 9, 503m<sup>2</sup> assuming turbines with blade lengths of 55m. The amendment would result in an increase of the rotor swept area to 20, 611m<sup>2</sup> assuming turbines with blade lengths of 81m. The minimum and maximum tip heights currently approved are 70m and 180m respectively. It is not known what the impact of the size of turbines proposed for the Modderfontein WEF would be to bats because of a lack of published data from wind energy facilities with turbines of a comparative size. However, five of the bat species that potentially occur on site exhibit behaviour that may bring them into contact with wind turbine blades and are thus potentially at risk of negative impacts if not properly mitigated. This includes three high risk species (Egyptian free-tailed bat, Natal long-fingered bat, and Cape serotine) and one medium-high risk species (Temminck’s myotis). The Egyptian free-tailed bat, Natal long-fingered bat and Cape serotine have all suffered mortality at operational wind energy facilities in South Africa, with Egyptian free-tailed bat fatalities being confirmed at the adjacent Nobelsfontein WEF. Direct impacts of the grid connection transmission lines would primarily be limited to fruit bats which might migrate through the area.*

The Bat Specialist’s mitigations for bat impacts:

*In addition to the specific mitigation measures required in terms of the aforementioned potential impacts (and as detailed in the Environmental Management Programme (EMPr)) the following measures must be implemented:*

- *Twelve months pre-construction acoustic monitoring to be completed prior to the commencement of construction; this must be according to the latest available monitoring guideline at the time of commencement. Results of the monitoring must inform the final design and layout of the facility and initial mitigation plan.*
- *Operational acoustic monitoring must be implemented at the commencement of operations accordingly to the latest guidelines and must be continued for at least the first two years of operations.*
- *Carcass searching must be undertaken according to latest guidelines and continue for at least two years into operations.*

- *Prior to construction a bat specialist must be appointed to conduct a site walkthrough to confirm turbine positions and approve final layout of the facility.*
- *A bat management plan must be produced based on the results of the pre-construction monitoring; this plan must be continuously updated by a bat specialists based on the results of the operational monitoring.*

### **Conclusion**

*In summary, the proposed amendment is acceptable from a bat sensitivity perspective, with expected low impacts to bats during the construction and operational phases of the development except for bat collisions during migration, which will be of medium significance. Cumulative impacts were assessed to be of medium impact after mitigation.*

Based on the information presented by the Bat Specialist, the proposed WEF amendment development is acceptable, providing that the prescribed mitigation measures are implemented.

**There is therefore no evidence that the proposed amendment should not be granted.**

### **8.1.8 Heritage Impact Findings**

The independent specialist CTS Heritage (C/O Jenna Levin) (hereinafter referred to as the “Heritage Specialist”) was appointed to undertake the Heritage Impact Assessment for the proposed amended layout to determine the impacts thereof.

The Heritage Specialist findings pertaining to the WEF amendment development as follows:

### ***Recommendations***

*It must be noted that the provisions related to impacts to heritage in the existing Environmental Authorisation detailed in section 1.2 above are wholly inadequate and will not mitigate the anticipated negative impacts to heritage resources. It is recommended that these provisions are amended to reflect the following conditions.*

### **Northern Cape**

*The submitted HIA satisfies the requirements of section 38(3) of the NHRA. There is no objection to the proposed development on heritage grounds on condition that:*

- *The revised amended layout is preferred as an alternative*
- *A no-go development buffer of 100m must be implemented around SAHRIS Sites 34716, 34631 and 34632, and archaeological sites MDF\_WEF 40 and MDF\_WEF 68. This will require an amendment to the proposed revised layout of the roads.*
- *A Heritage Management Plan for rock engravings, rock painting and gong rocks must be compiled and submitted to SAHRA*
- *A pre-construction walkdown of the final authorised layout including the powerline route must be conducted by both an archaeologist and a palaeontologist to identify any areas requiring targeted mitigation in the form of excavation or removal of heritage resources. A walkdown report detailing the findings of the walkdown and the final layout must be submitted to SAHRA.*
- *The attached Chance Fossil Finds Procedure must be implemented for the duration of the construction phase*
- *Should any previously undocumented heritage resources be identified during the course of the construction, operation or decommissioning of the project, work must cease in the area of the find and SAHRA must be contacted regarding a way forward.*

### **Western Cape (Authorised Layout)**

*The submitted HIA satisfies the requirements of section 38(3) of the NHRA.*

- *A no-go development buffer of 100m must be implemented around sites S7 and S8 (SAHRIS IDs 34634 and 34636).*
- *A Heritage Management Plan for rock engravings, rock painting and gong rocks must be compiled and submitted to SAHRA*
- *A pre-construction walkdown of the final authorised layout including the powerline route must be conducted by both an archaeologist and a palaeontologist to identify any areas requiring targeted mitigation in the form of excavation or removal of heritage resources. A walkdown report detailing the findings of the walkdown and the final layout must be submitted to SAHRA.*
- *The attached Chance Fossil Finds Procedure must be implemented for the duration of the construction phase*
- *Should any previously undocumented heritage resources be identified during the course of the construction, operation or decommissioning of the project, work must cease in the area of the find and SAHRA must be contacted regarding a way forward.*

### **Western Cape (Revised Amended Layout)**

*The submitted HIA satisfies the requirements of section 38(3) of the NHRA. There is no objection to the proposed development on heritage grounds on condition that:*

- *The revised amended layout is preferred as an alternative*
- *A no-go development buffer of 100m must be implemented around Sites MDF 028 and MDF 029. This will require an amendment to the proposed revised layout of the roads.*



- *A Heritage Management Plan for rock engravings, rock painting and gong rocks must be compiled and submitted to SAHRA*
- *A pre-construction walkdown of the final authorised layout including the powerline route must be conducted by both an archaeologist and a palaeontologist to identify any areas requiring targeted mitigation in the form of excavation or removal of heritage resources. A walkdown report detailing the findings of the walkdown and the final layout must be submitted to SAHRA.*
- *The attached Chance Fossil Finds Procedure must be implemented for the duration of the construction phase*
- *Should any previously undocumented heritage resources be identified during the course of the construction, operation or decommissioning of the project, work must cease in the area of the find and SAHRA must be contacted regarding a way forward.*

Based on the information presented by the Heritage Specialist, the proposed WEF amendment development is acceptable, providing that the prescribed mitigation measures are implemented.

**There is therefore no evidence that the proposed amendment should not be granted.**

### 8.1.9 Archaeological and Heritage Impact Assessment Findings

The independent specialist CTS Heritage (C/O Jenna Levin) (hereinafter referred to as the “Archaeological Specialist”) was appointed to undertake the archaeological impact assessment for the proposed amended layout to determine the impacts thereof.

The Archaeological Specialist findings pertaining to the WEF amendment development as follows:

Based on the outcomes of this report, it is not anticipated that the proposed development will negatively impact on significant archaeological heritage on condition that the following recommendations are implemented:

#### **For the Authorised Layout:**

- *No development takes place within 100m of identified rock art sites or of identified stone kraals*
- *No impact to any significant identified archaeological resource is permitted including sites S31, S32 and S39 (SAHRIS IDs 34718, 34719 and 34737)*
- *Should any new heritage resources be uncovered during the course of development activities, work in the vicinity of the find must cease and HWC (in the Western Cape) and SAHRA (in the Northern Cape) must be contacted regarding an appropriate way forward.*

#### **For the proposed amended layout:**

- *The turbine proposed to be located in the vicinity of sites MDF 028 and MDF 029 is moved to an alternative location more than 100m away from the identified archaeological heritage*
- *Besides the relocation of the turbine at MDF 028 & 029, no mitigation is necessary as the turbine positions are outside of the 100m buffers surrounding any IIC or above sites*
- *No impact to any significant identified heritage resource is permitted including sites S31, S32 and S39 (SAHRIS IDs 34718, 34719 and 34737)*
- *Should any new heritage resources be uncovered during the course of development activities, work in the vicinity of the find must cease and HWC (in the Western Cape) and SAHRA (in the Northern Cape) must be contacted regarding an appropriate way forward.*

Based on the information presented by the Archaeological Specialist, the presented amendments are acceptable and implementable, providing that the prescribed mitigation measures are implemented.

**There is therefore no evidence that the proposed amendment should not be granted.**

### 8.1.10 Palaeontological Specialist Assessment Findings

The independent specialist CTS Heritage (C/O Jenna Levin) (hereinafter referred to as the “Palaeontological Specialist”) was appointed to undertake the archaeological impact assessment for the proposed amended layout to determine the impacts thereof.

The Palaeontological Specialist findings pertaining to the WEF amendment development as follows:

*It is concluded that the majority of the Modderfontein WEF project area is, in practice, of Low palaeosensitivity with scattered, and to some extent unpredictable, islands of High sensitivity. No palaeontological Very High Sensitivity / No-Go areas have been identified or designated here and the WEF project proposal is not fatally flawed from a palaeontological heritage viewpoint. None of the recorded fossil sites overlaps directly with the amended turbine locations and no exclusion or re-siting of the amended turbine sites on palaeontological grounds is proposed here.*

*The anticipated impact significance of the amended turbine layout in terms of palaeontological heritage is substantially lower compared with the original, authorized turbine layout principally due to (1) the much smaller number of amended turbine sites and (2) the siting of a high proportion of these sites on unfossiliferous doleritic ridges and plateaux, or on adjoining thermally-metamorphosed sedimentary bedrocks of low palaeosensitivity. Construction phase excavations and surface clearance for associated infrastructure such as access roads and hard stand areas pose a more serious threat to local palaeontological heritage than wind turbine footings. The overall palaeontological impact significance of amended Modderfontein WEF project – and hence the level of proposed mitigation - can only be formally assessed when the complete finalized layout (including grid connection corridor) becomes available but in any event will be markedly lower than that of the authorized WEF project.*

*Micro-siting of turbine positions and other WEF infrastructure in relation to known fossil sites is generally not recommended. Inevitable negative impacts within the final WEF footprint can usually be effectively mitigated by pre-construction palaeontological surveying of potentially sensitive sectors of the WEF footprint (including the grid connection corridor). This would entail specialist recording and judicious sampling of any fossil specimens of scientific and / or conservation value plus specific, realistic recommendations for any necessary, targeted mitigation during the construction phase. During the construction phase itself a Chance Finds Fossil Procedure driven by the responsible environmental site officers and ECO should be implemented.*

*These palaeontological heritage recommendations are broadly in line with those made by in 2011 by Heritage Western Cape with respect to the original Karoo Renewable Energy Facility project area of which the Modderfontein WEF project area forms a part. SAHRA’s (2011) additional requirement that fresh excavations undertaken into the Teekloof Formation should be inspected by a palaeontologist during the construction phase is considered to be unduly onerous and unlikely to yield much useful palaeontological material or data. Furthermore, finding suitably qualified palaeontologists willing or able to undertake such work for long stretches during the WEF construction phase would be very challenging. For these reasons, mitigation through targeted pre-construction fossil recording and collection supplemented by a fully implemented Chance Fossil Finds Procedure during the construction phase is preferred.*

*All palaeontological specialist work should conform to international best practice for palaeontological 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 palaeontological heritage studies developed by SAHRA (2013) and HWC (2021). The palaeontological assessment reports must be submitted for consideration to both Heritage Western Cape and SAHRA.*

Based on the information presented by the Palaeontological Specialist, the presented amendments are acceptable and implementable, providing that the prescribed mitigation measures are implemented.

**There is therefore no evidence that the proposed amendment should not be granted.**

### 8.1.11 Social Impact Assessment Findings

The independent specialist Batho Earth (C/O Ingrid Snyman) (hereinafter referred to as the “Social Specialist”) was appointed to undertake the Social Impact Assessment for the proposed amended layout to determine the impacts thereof.

The Social Specialist findings pertaining to the WEF amendment development as follows:

*Based on the concise desktop assessment of the receiving environment and the anticipated impacts associated with the Modderfontein WEF, it is concluded that there are no socio-economic impacts of a high significance associated with the project at this stage.*

*There are a range of positive impacts associated with the proposed project, such as the creation of employment and income generation, local procurement and social development and services support, as well as the stimulation of local economic growth. Another positive impact is the positive impact on the improved electricity supply.*

*There are however several potential negative socio-economic impacts of the proposed project that may affect surrounding landowners and residential areas. These would mostly materialise during the construction phase and are thus of a short duration. These impacts would further respond to mitigation. The negative impacts associated with the proposed project include the intrusions on the daily living and movement patterns (inflow of workers and possibly jobseekers), increased nuisance factors (dust levels, noise and traffic movement) and impact on sense of place.*

*From a socio-economic perspective it is concluded that the project can be supported and it is recommended that the development of the Modderfontein WEF be approved by the relevant authorities.*

Based on the information presented by the Social Specialist, the presented amendments are acceptable and implementable, providing that the prescribed mitigation measures are implemented.

**There is therefore no evidence that the proposed amendment should not be granted.**

### 8.1.12 Town Planning Findings

The independent specialist Warren Petterson Planning (C/O Andries du Plessis) (hereinafter referred to as the “Town Planning Specialist”) was appointed to undertake the Town Planning Study for the proposed amended layout to determine the impacts thereof.

The Town Planning Specialist response pertaining the proposed amendments is as follows:

*Developing countries like South Africa is dependent on a growing economy and the resources that are required to support such an economy. A reliable supply of electricity is such a resource and is key in any emerging economy. South Africa’s current electricity crisis has resulted in both Government and the Private Sector initiatives to explore alternative energy resources. Renewable energy as an answer to address this crisis is promoted by Government through various policies and legal documents like the White Paper on Energy (1998), the White Paper on Renewable Energy (2003) and the South African Renewables Initiative (2010).*

*The proposed Modderfontein WEF is located within an identified REDZ zone (Renewable Energy Development Zone) and is therefore in line with the provision of renewable energy as published in Government Notice No. 142, 144 and 145 in Government Gazette No. 44191. Considering the preliminary investigation regarding town planning requirements as set out in this report, there are no aspects which will prohibit the development of the Moddefontein WEF. More detailed studies, title deed scrutiny and policy compliance / alignment will be required before any final decision / outcome can be reached.*

Based on the information presented by the Town Planning Specialist, the presented amendments are acceptable and implementable, providing that the prescribed mitigation measures are implemented. **No additional impacts or mitigation measures were identified.**  
**There is therefore no evidence that the proposed amendment should not be granted.**

### 8.1.13 Traffic Impact Assessment Findings

The independent specialist Innovative Transport Solutions (C/O Christoff Krogscheepers) (hereinafter referred to as the “Traffic Specialist”) was appointed to undertake the Traffic Impact Assessment for the proposed amended layout to determine the impacts thereof.

The Traffic Specialist findings pertaining to the WEF amendment development as follows:

#### Existing Traffic Conditions

- *The current demand on the existing road network in the site vicinity is low and the road network and intersections operate at acceptable levels of service.*

#### 2026 Background Traffic Conditions

- *A growth rate of 3 percent per annum was applied to the existing traffic volumes to determine the 2026 background traffic conditions.*
- *All the intersections and roadways will continue to operate at acceptable levels-of service in the future during the worst peak hours of the year without the proposed development.*

#### Construction Phase

- *It is expected that the construction phase of the proposed development could generate up to 182 vehicular trips during the average weekday of which approximately 8% will be heavy truck traffic.*
- *Access to the site is proposed via existing farm accesses off the Biesiespoort Road.*

#### Operational Phase

- *The operational phase of this project is not expected to generate significant traffic volumes. The typical day-to-day activities will probably only be service vehicles undertaking general maintenance at the site. The number of permanent staff on site is not expected to be more than 40 people and therefore no additional upgrades are required to accommodate the operational site traffic.*

#### Development Alternatives

- *The approved layout with 67 turbines were evaluated as an alternative. The approved layout will generate more trips and have a longer construction period than the preferred alternative. This means that the approved development with the 67 turbines will have a higher transport impact than the preferred layout with only 34 turbines. However, in terms of the higher construction traffic volumes and the longer construction period the higher transport impact associated with the approved layout is of low negative significance.*



Decommissioning Phase

- *If the wind farm is not upgraded at the end of the typical lifespan (20 to 25 years) the site will be decommissioned. The decommissioning of the Modderfontein WEF is expected to take between 6 to 12 months. The expected transport impact on the road network during the decommissioning phase will be similar to the transport impact during the construction phase. The surrounding road network has sufficient capacity to accommodate the expected traffic volumes associated with the decommissioning of the wind farm.*

Traffic Management and Transportation Plan

- *During the construction phase there will be an increase in truck traffic along the roads in the site vicinity, compared to the current truck traffic along these roads. However, the expected total traffic volumes along these roads will still be well within the function of the roads and no operational or safety issues are expected.*
- *It is recommended that construction and abnormal load traffic should be limited to outside the typical traffic peaks in build-up areas and through towns.*
- *Most of the equipment and construction material will be delivered to the site with heavy vehicles. The turbine components will be transported by abnormal load vehicles. It is expected that the delivery of the equipment can occur over an 18-month period and the impact of the delivery vehicles on the existing traffic along the road network in the site vicinity will be acceptable. All deliveries with abnormal loads will operate under an approved transportation plan with the necessary traffic routes and traffic accommodation plans in place.*

In conclusion, the existing road network has sufficient spare capacity to accommodate the amendment to the Modderfontein Wind Energy Facility without any road upgrades required to the existing road infrastructure. **No additional impacts or mitigation measures were identified. It is recommended that the proposed Modderfontein WEF Part 2 Amendment Application be**

## 8.2 POTENTIAL IMPACTS ASSOCIATED WITH THE PROPOSED AMENDMENTS

The intention of this chapter is to raise awareness with regard to **potential** impacts that are evident through the establishment and operation of the Project and associated infrastructure.

The **potential** impacts listed below have been assessed based on available information and through specialist recommendations, which have provided mitigation measures to ensure that the impacts associated with the activity are mitigation to acceptable levels.

Potential environmental impacts and issues that may be associated with the construction, operational and decommissioning phases of the proposed project and a summary of these have been identified and are listed below. Further please refer to the Figure below for a lifecycle depiction of the Project. The applicability and degree and extent of these impacts are anticipated to vary depending on the lifecycle stage of the development.

As part of this Amendment Process, an Environmental Management Programme (EMPr) will be compiled for the various project life cycle stages to ensure that these impacts are minimised and/or eliminated where feasible.

### Anticipated Project Life Cycle Phases:



### **Methodology for Assessment of Potential Impacts**

The assessment of the potential impacts has been based on extensive experience related to environmental impact assessment as well as informed by specialist assessments and inputs, where applicable on the basis of professional judgement.

In this Amendment Report, the types of potential impacts (direct, indirect, and cumulative) have been considered along with the nature and magnitude (severe, moderate, and low), extent and location of the potential impacts.

A prediction has been made of the timing (construction, operation or decommissioning phase) and duration (short, long term, intermittent or continuous) of the potential impact. A prediction has also been made of the likelihood or probability of impacts occurring and an estimation of the significance of the potential impact (local, regional or global scale).

Mitigation measures have been identified that are required to be implemented to lessen the potential impacts to acceptable levels and an evaluation of the predicted significance of residual impacts after mitigation is put into place, has been made. The assessment of the potential impacts will be carried out in a methodology that has been adapted from best practice guidelines disseminated from the Competent Authority.

These impacts have been identified based on the following:

- Inspection of the site and surroundings (current environmental conditions);
- Discussions with members of the project team;
- Discussions with relevant authorities;
- Previous investigations in the area;
- Independent specialist studies; and
- Determining future changes to the environment as a result of the proposed activity.

In order to comparatively rank the impacts, each impact has been assigned a score using the scoring system outlined in Table 6 below. This scoring system allows for a comparative, accountable assessment of the indicative cumulative positive or negative impacts of each aspect assessed. A summary of the various impact scores is presented in Table 7 below to allow for easy reference and comparison of the various alternatives scoring.

**Table 6:** Definition of Ranking Tiers for Impact Scoring

ITEM	DEFINITION
<b>EXTENT</b>	
Local	Extending only as far as the boundaries of the activity, limited to the site and its immediate surroundings
Regional	Impact on the broader region
National	Will have an impact on a national scale or across international borders
<b>DURATION</b>	
Short-term	0-5 years
Medium-Term	5-15 years
Long-Term	>15 years, where the impact will cease after the operational life of the activity
Permanent	Where mitigation, either by natural process or human intervention, will not occur in such a way or in such a time span that the impact can be considered transient.
<b>MAGNITUDE OR INTENSITY</b>	
Low	Where the receiving natural, cultural or social function/environment is negligibly affected or where the impact is so low that remedial action is not required.
Medium	Where the affected environment is altered, but not severely and the impact can be mitigated successfully and natural, cultural or social functions and processes can continue, albeit in a modified way.
High	Where natural, cultural or social functions or processes are substantially altered to a very large degree. If a negative impact then this could lead to unacceptable consequences for the cultural and/or social functions and/or irreplaceable loss of biodiversity to the extent that natural, cultural or social functions could temporarily or permanently cease.
<b>PROBABILITY</b>	
Improbable	Where the possibility of the impact materialising is very low, either because of design or historic experience
Probable	Where there is a distinct possibility that the impact will occur
Highly Probable	Where it is most likely that the impact will occur
Definite	Where the impact will undoubtedly occur, regardless of any prevention measures
<b>SIGNIFICANCE</b>	
Low	Where a potential impact will have a negligible effect on natural, cultural or social environments and the effect on the decision is negligible. This will not require special design considerations for the project
Medium	Where it would have, or there would be a moderate risk to natural, cultural or social environments and should influence the decision. The project will require modification or mitigation measures to be included in the design
High	Where it would have, or there would be a high risk of, a large effect on natural, cultural or social environments. These impacts should have a major influence on decision making.
Very High	Where it would have, or there would be a high risk of, an irreversible negative impact on biodiversity and irreplaceable loss of natural capital that could result in the project being environmentally unacceptable, even with mitigation. Alternatively, it could lead to a major positive effect. Impacts of this nature must be a central factor in decision making.
<b>STATUS OF IMPACT</b>	
Whether the impact is positive (a benefit), negative (a cost) or neutral (status quo maintained)	
<b>DEGREE OF CONFIDENCE IN PREDICTIONS</b>	
The degree of confidence in the predictions is based on the availability of information and specialist knowledge (e.g. low, medium or high)	
<b>MITIGATION</b>	
Mechanisms used to control, minimise and or eliminate negative impacts on the environment and to enhance project benefits Mitigation measures should be considered in terms of the following hierarchy: (1) avoidance, (2) minimisation, (3) restoration and (4) off-sets.	

**Table 7:** Scoring System for Impact Assessment Ratings

IMPACT PARAMETER	SCORE	
<b>Extent (A)</b>	<b>Rating</b>	
Local	1	
Regional	2	
National	3	
<b>Duration (B)</b>	<b>Rating</b>	
Short term	1	
Medium Term	2	
Long Term	3	
Permanent	4	
<b>Probability (C)</b>	<b>Rating</b>	
Improbable	1	
Probable	2	
Highly Probable	3	
Definite	4	
IMPACT PARAMETER	NEGATIVE IMPACT SCORE	POSITIVE IMPACT SCORE
<b>Magnitude/Intensity (D)</b>	<b>Rating</b>	<b>Rating</b>
Low	-1	1
Medium	-2	2
High	-3	3
<b>SIGNIFICANCE RATING (F) = (A*B*D)*C</b>	<b>Rating</b>	<b>Rating</b>
Low	0 to - 40	0 to 40
Medium	- 41 to - 80	41 to 80
High	- 81 to - 120	81 to 120
Very High	> - 120	> 120

*The above significance bands have been determined through calculating a maximum potential score of 144 (e.g. positive or negative) using the above methodology. This was then subdivided into broad bands as indicated above to provide a comparative assessment of all impacts in relation to the maximum possible significance score. The overall status of the impact (after mitigation) for the preferred alternative is stated in each table below.*

The **Significance Ratings** provided in the summary table of all specialists' impact ratings (Table 7) are used as an overall measure of impact, taking into account all contributing parameters.

### 8.3 SUMMARY OF IMPACT ASSESSMENT UNDERTAKEN

The EIA undertaken in 2011, assessed the impact of the proposed Modderfontein WEF and concluded that impacts can be mitigated to an acceptable level. It was further concluded that with appropriate mitigation, the benefits of the proposed Modderfontein Wind Energy Project will outweigh the negative impacts. As such the Modderfontein WEF was granted EA on 22 February 2012. This represents the No-Go Alternative.

Table 8 below provides a summary and comparison of the impact significance ratings, with mitigation, between the 2012 Authorised No-Go Alternative and 2021 Amended Alternative.

**Table 8:** Summary table of all specialist study impact ratings

DESCRIPTION OF IMPACT	Overall Significance (With Mitigation)	
	Authorised/No-Go Alternative <sup>3</sup>	Amended Alternative <sup>4</sup>
<b>PLANNING AND DESIGN</b>		
<b>Socio-economic Impacts</b> (updated 2021 impact rating)		
Modderfontein WEF was found to be in alignment with the general provisions of the relevant national, provincial and local level policy and planning documents pertaining to renewable energy development, socio-economic development, and locational siting specific criteria.	High +	High +
<b>CONSTRUCTION PHASE</b>		
<b>Ecological Impacts</b>		
Vegetation	Medium -	Medium -
Threatened Fauna (2 reptile species)	Medium -	Medium -
Threatened Fauna (Riverine Rabbit)	Zero	Zero
Alien invasive plants	Low -	Low -
<b>Agricultural Impacts</b>		
Degradation of the natural resource: Soil Erosion	Low -	Low -
Disturbance to the soil profile and structure	Low -	Low -
Disturbance to surface drainage works	Low -	Low -
Disruption of farming activities	Low -	Low -
<b>Avifaunal Impacts</b>		
Displacement of priority species due to construction activities	Low -	Low -
<b>Bats Impacts</b>		
Roost destruction	Low -	Low -
Habitat Modification	Low -	Low -
<b>Freshwater Impacts</b>		

<sup>3</sup> The 2012 authorised layout.

<sup>4</sup> The 2021 amended layout.

DESCRIPTION OF IMPACT	Overall Significance (With Mitigation)	
	Authorised/No-Go Alternative <sup>3</sup>	Amended Alternative <sup>4</sup>
Disturbance of aquatic habitat; modification to flow and water quality due to the proposed activities on or adjacent to aquatic ecosystems	Low -	Low -
Loss of biodiversity & habitat, impeding flow and water quality impact	Low -	Low -
Disturbance of aquatic habitat- Facilitation of erosion and invasion by alien plants	Low -	Low -
Habitat disturbance and some flow and water quality impacts	Low -	Low -
<b>Visual Impacts</b>		
Views of construction activities, materials and equipment storage, and landscape disturbance	Low -	Low -
Disturbance of the landscape due to cut and fill slopes associated with road construction. This is particularly likely in areas where roads run along and through ridgelines.	Low -	Low -
<b>Noise Impacts</b>		
Grading and building of new roads and trenches	Low -	Low -
Preparation of the footprint, earthworks and construction of the base of the wind turbine	Low -	Low -
Construction of the wind turbines on site	Low -	Low -
Construction vehicles	Low -	Low -
<b>Heritage Impacts</b>		
Destruction of significant archaeological heritage resources during the construction phase	Low -	Low -
Destruction of significant palaeontological heritage resources during the construction phase	Low -	Low -
<b>Socio-economic Impacts</b>		
Job Creation and Skills Inequities	Medium +	Medium +
Inflow of workers	Medium -	Medium -
Influx of job seekers	Medium -	Medium -
Accommodation of workforce	Medium +	Medium +
Intrusion related impacts	Low -	Low -
Local Procurement	Low +	Medium +
Impact on Ubuntu Local Municipality	Medium -	Low -
Impact on tourism	Medium +	Medium +
Visual Impact	Medium -	Low -
<b>OPERATIONAL PHASE</b>		
<b>Ecological Impacts</b>		
Vegetation	Medium -	Medium -
Threatened Fauna (2 reptile species)	Medium -	Medium -
Threatened Fauna (Riverine Rabbit)	Zero	Zero
Alien invasive plants	Low -	Low -
<b>Agricultural Impacts</b>		



DESCRIPTION OF IMPACT	Overall Significance (With Mitigation)	
	Authorised/No-Go Alternative <sup>3</sup>	Amended Alternative <sup>4</sup>
Occupation of high potential arable or cultivated land	Low -	Low -
Increased farm security	Low -	Low -
<b>Avifaunal Impacts (updated)</b>		
Displacement of priority species due to operational activities	Low -	Low -
Turbine collision mortality	Medium-High -	Low -
<b>Bat Impacts</b>		
Habitat creation in High-Risk Locations	Low -	Low -
Mortality during commuting and/or foraging	Low -	Low -
Mortality during migration	Medium -	Medium -
Light Pollution	Low -	Low -
<b>Freshwater Impacts</b>		
Disturbance of aquatic habitat- Facilitation of erosion and invasion by alien plants	Low -	Low -
<b>Visual Impacts</b>		
Visual impact on users of major and secondary roads in close proximity	Medium -	Medium -
Views of turbines from homesteads and settlements in close proximity	Medium -	Medium -
Views of turbines from homesteads and roads in the region	Low -	Low -
View of night time lighting including aircraft warning lights and lighting of the facility	Low -	Low -
Views of roads as seen by observers in close proximity to the WEF.	Low -	Low -
Shadow flicker affecting residents of homesteads	Low -	Low -
Industrialisation of views over a relatively natural Karoo landscape	Low -	Low -
Views of industrialised landscape being obvious within views of natural landscape areas that are popular with tourists	Low -	Low -
<b>Noise Impacts</b>		
Noise generated by the wind turbines	Low -	Low -
Traffic	Low -	Low -
Sub-station and overhead power lines	Low -	Low -
<b>Heritage Impacts</b>		
<i>No impacts are expected during the operational phase of the project</i>		
<b>Socio-economic Impacts</b>		
Job creation	Medium +	Medium +
Intrusion Impacts	Medium -	Low -
Impact on tourism	Medium +	Medium +
Local Procurement	Low +	Medium +
Local Economic Contribution	Medium +	Medium +
Social development and social services support	Medium +	Medium +

DESCRIPTION OF IMPACT	Overall Significance (With Mitigation)	
	Authorised/No-Go Alternative <sup>3</sup>	Amended Alternative <sup>4</sup>
Land Value	Medium -	Low -
Visual impact and sense of place	Medium -	Medium -
<b>DECOMMISSIONING PHASE</b>		
<i>Decommissioning impacts are equivalent to the construction phase impacts</i>		
<b>CUMULATIVE IMPACTS</b>		
<b>Ecological Impacts</b>		
Loss of endangered vegetation types and plant species	Medium -	Medium -
<b>Agricultural Impacts</b>		
Disruption of farming activities	Low -	Low -
<b>Avifaunal Impacts</b>		
Displacement and mortality of priority species due to construction and operational activities of the WEF	Low -	Low -
<b>Bat Impacts</b>		
Bat mortality due to the construction and operational activities of the WEF	Low -	Low -
<b>Freshwater Impacts</b>		
Habitat disturbance and some flow and water quality impacts	Low -	Low -
<b>Visual Impacts</b>		
Presence of large/tall wind energy turbine towers which will result in local change to the scenic landscape	Medium -	Medium -
<b>Noise Impacts</b>		
Noise generated by the wind turbines	Low -	Low -
<b>Heritage Impacts</b>		
Impact on heritage resources on the WEF site	Low -	Low -
<b>Socio-economic Impacts</b>		
In terms of cumulative impacts there would be the potential for sequential visibility (e.g., the effects of seeing two or more wind farms along a single journey, e.g., road or walking trail). This would apply to motorists travelling along the N12 and local roads. The findings of the VIA indicate that the consideration of cumulative visual impacts relates to the proposed wind energy farm in the context of other similar developments planned for the area.	Medium -	Medium -
The proposed Modderfontein WEF and establishment of the other renewable energy facilities in the Ubuntu Local Municipality and the Beaufort West Local Municipality also have the potential to result in significant positive cumulative socio-economic impacts for both municipalities. The positive cumulative impacts include creation of employment, skills development, and training opportunities (construction and operational phase), creation of downstream business opportunities and stimulation of the local property market.	High +	High +

## 9 ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

Please refer to Appendix E for a copy of the updated draft EMPr. The EMPr has only been updated with the additional mitigation measures as provided by the specialists, the previous mitigation measures are still included in the EMPr.

## 10 PUBLIC PARTICIPATION PROCESS

### 10.1 OBJECTIVES OF THE PUBLIC PARTICIPATION PROCESS

The public consultation process is designed to provide information to and receive feedback from interested and affected parties (I&AP), thus providing organisations and individuals with an opportunity to raise concerns and make comments and suggestions regarding the proposed Project.

The principles for the Environmental Impact Assessment (EIA) that determine communication with society at large are included in the principles of the National Environmental Management Act (NEMA) (Act 107 of 1998, as amended) and are elaborated upon in General Notice 657, titled “Guideline 4: Public Participation” (Department of Environmental Affairs and Tourism, 19 May, 2006), which states that: “*Public participation process means a process in which potential interested and affected parties (I&APs) are given an opportunity to comment on, or raise issues relevant to, specific matters.*” Public participation is an essential and regulatory requirement for an environmental authorisation process and must be undertaken in terms of the Environmental Impact Assessment (EIA) Regulations GN R.982 (December 2014, as amended). Public participation is a process that is intended to lead to a joint effort by stakeholders, technical specialists, the authorities and the proponent/developer who work together to produce better decisions than if they had acted independently.

The public participation process is designed to provide sufficient and accessible information to Interested and Affected Parties (I&APs) in an objective manner.

The purpose of the Public Participation Process (PPP) is to enable I&AP’s to:

- Understand the context of the Amendment Report;
- Become informed and educated about the proposed project and its potential impacts;
- Raise issues of concern and suggestions for enhanced benefits; and
- Contribute relevant local information and traditional knowledge to the environmental assessment.

### 10.2 REQUIREMENTS FOR THIS PUBLIC PARTICIPATION PROCESS

Regulation 32 of the NEMA EIA Regulations (2014, as amended) state the following:

*“1. The applicant must within 90 days of receipt by the competent authority of the application made in terms of regulation 31, submit to the competent authority –*

*(a) a report, reflecting-*

*(i) an assessment of all impacts related to the proposed change;*

*(ii) advantages and disadvantages associated with the proposed change;*

*(iii) measures to ensure avoidance, management and mitigation of impacts associated with such proposed change; and*

*(iv) any changes to the EMPr;*

*which report –*

*(aa) had been subjected to a public participation process, which had been agreed to by the competent authority, and which was appropriate to bring the proposed change to the attention of*

*potential and registered interested and affected parties, including organs of state, which have jurisdiction in respect of any aspect of the relevant activity, and the competent authority, and (bb) reflects the incorporation of comments received, including any comments of the competent authority, or*

*(b) a notification in writing that the report will be submitted within 140 days of receipt of the application by the CA as significant changes have been made or significant new information has been added to the report which changes or information was not contained in the report consulted on during the initial PPP contemplated in subregulation (1)(a) and that the revised report will be subjected to another PPP of at least 30 days.”*

In terms of 32 (1) (a), the Amendment Report will be subjected to public consultation in line with Regulation 41.

### **10.3 STEPS TAKEN TO NOTIFY POTENTIALLY INTERESTED AND AFFECTED PARTIES**

#### **Identification of Stakeholders**

The I&AP database developed during the previous EIA process (completed in 2011) was verified and used to inform all I&APs during this public participation process.

#### **Communication with Stakeholders**

In terms of the NEMA EIA Regulations (2017, as amended), potential I&AP's are given **30 calendar days** within which to register and issue comments on this Draft Amendment Report (and associated annexures) from **01 June 2021 to 01 July 2021**.

- An **existing stakeholder database** already exists from the previous EIA completed in 2013. The contact details of these stakeholders have been verified and updated in April 2020 (through phone calls and emails) and these registered stakeholders have been notified via written notice (by email and SMS) of the Amendment Application and the availability of the Draft Amendment Report for a **30-day comment period**.
- **Site notice boards** (with minimum dimensions of 60cm X 42cm) were erected on the boundary of the Modderfontein site (at strategic viewable location).
- An **advertisement** was placed in one **local newspaper (Noordwester/ Messenger)** and one **provincial newspaper (The Courier)**.
- The **Draft Amendment Report** (and associated annexures) for comment is available to stakeholders through an **online electronic link** (<https://bit.ly/3wqJmg6>)

The above listed **Public Participation Plan** (in accordance with the **new EIA Directions dated 05 June 2020**) was approved by DFFE on 07 July 2021.

Comments received during this public consultation will be recorded in a Comments and Response Report. Comments received will be responded to by the EAP, Applicant and specialists as required.

#### 10.4 AUTHORITY CONSULTATION

The following Authorities have been notified of the Project as part of the Public Participation process:

- Birdlife SA
- Ubuntu Local Municipality
- Beaufort West Local Municipality
- Central Karoo District Municipality
- Pixley Ka Seme District Municipality
- The National Department of Fisheries, Forestry and the Environment
- Western Cape Department of Environmental Affairs & Development Planning (DEA&DP)
- National Energy Regulator of South Africa (NERSA)
- National Department of Water and Sanitation
- Department of Economic Development and Tourism
- National Department of Energy
- National Department of Fisheries, Forestry and Agriculture – Agricultural
- Provincial Departments of Agriculture – Agriculture
- Western Cape Department of Agriculture
- Provincial Departments of Environmental Affairs and Nature Conservation: Northern Cape
- Provincial Department of Finance, Economic Affairs and Tourism: Northern Cape
- Provincial Department of Social Development: Northern Cape
- Department of Transport, Roads and Public Works
- Western Cape Department of Transport
- Department of Agriculture, Land Reform and Rural Development
- South African Heritage Resource Agency (SAHRA)
- Northern Cape Heritage Authority / Ngwao Boswa Kapa Bokoni
- South African Civil Aviation Authority (CAA)
- South African Air Force – Aviation
- SANPARKS
- SANRAL
- ESKOM
- WESSA
- Geoscience
- Heritage Western Cape
- Cape Nature

#### 10.5 PROOF OF NOTIFICATION

A copy of the contents and proofs of the site notices, contents of the adverts and notification letters, as well as details of the interested and affected parties and the occupiers of the affected properties notified, will be attached to this report prior to final submission to the Competent Authority.

#### 10.6 LIST OF REGISTERED INTERESTED AND AFFECTED PARTIES (I&AP'S)

The lists (databases) containing contact details of all persons notified during this PPP is contained in Appendix D.

## 11 EAP RECOMMENDATIONS AND CONCLUDING REMARKS

The investigation of potential environmental impacts associated with the proposed amendment indicates that the overall impacts identified during the 2011 Environmental Impact Assessment will remain the same or slightly decrease. Management measures specified by the Specialist's in their original (2011) and updated (2021) studies must be implemented for the WEF development site to ensure impacts are adequately mitigated.

Based on the available information it is reasonable to conclude that potential environmental impacts related to the Modderfontein WEF have been adequately assessed and confirmed by the various independent Specialists. Please refer to their studies and supporting statements attached as Appendix C (and summarised in Section 8 of this report).

Further to the above, the overarching potential advantages and disadvantages of the proposed amendments to the authorised Modderfontein WEF are noted as follows:

- Advantages:
  - No additional environmental impacts associated with the proposed amendment as compared to the authorised layout.
  - Avifaunal Impacts for Turbine Collision Mortality reduced from Medium-High Negative to Low Negative after mitigation.
  - The latest, most efficient wind energy technology will be available to the developer for implementation, allowing for efficient generation of energy supply.
  - More energy will be produced from fewer turbines. This will allow for greater efficiency of the WEF in supplying electricity to the national grid.
  - There will be no change in development rights and impacts on the site (as originally authorised).
  - The increased efficiency of the facility, and consequently the economic competitiveness thereof, will help to reduce the electricity tariffs charged by the facility.
  - There is a reduction in the development footprint as currently authorised due to the reduced density of WTGs and associated infrastructure
  
- Disadvantages:
  - The upgraded turbines have a greater overall height and therefore visual prominence. The visual specialist has indicated that this is offset by the overall reduced number of turbines (67 vs 34), and by mitigation measures such as reducing the turbines along roads.



The potential negative impacts of not approving the proposed amendments are:

- The amendment to the proposed wind energy facility is based on changes and improvements in the technologies employed for wind energy facilities. As such, should the amendment not be granted, the latest, most efficient wind energy technologies will not be available to the developer for implementation as part of the REIPPP. This could mean that the applicant would need to install the original number of turbines with a lower energy output as opposed to installing less turbines with the newer turbine technology with higher energy output. This will result in a loss the WEF facility's efficiency.

Importantly, there were **no fatal flaws** or fundamental issues identified for this amendment proposal during this assessment process by the project team, the independent specialists or the independent EAP.

**Based on the available information presented within this Amendment Report, which has been informed through independent specialist input, the EAP finds no reason why the following amendment applied for, should not be authorised:**

Details of the proposed Amendment, includes

- Reduction in the number of turbines from 67 to 34.
- Increase in the individual turbine rating from up to 3MW to up to 5.6MW.
- Increasing the WTG dimensions of up to 119m of hub height and up to 162m of rotor diameter, with a total of up to 81 m blade length.
- Total WEF generation capacity reduced from 201MW to 190.4MW.
- 34 temporary turbine laydown areas of 80m X 30m (81 600m<sup>2</sup>).
- 34 Concrete foundations to support the turbine towers (15m X 15m X 2.5m in depth)
- A 132kV substation with high voltage yard footprints of approximately 100m X 100m (1000m<sup>2</sup>);
- Underground cabling between the project components;
- One new overhead 132kV power lines of up to 1.5km in length, turning into the existing Droerivier/Hydra-2400kV line, and
- Internal access roads (5m wide and 40km long) linking the wind turbines and the infrastructure on the site.
- Administratively splitting the environmental authorisations to allow for the independent commercial operation of a Cluster A and a Cluster B for the site.
- Removal of a redundant land parcel, Portion 3 of the farm Noblesfontein 227 from the EA, as no development is currently authorised on this land parcel and not development is proposed over this land parcel.

This Amendment Report and supporting documentation is considered adequate in meeting the requirements of the relevant legislation, and the EAP believes that sufficient information is presented and no reason why the DFFE should not approve this amendment.

The EAP is of the opinion that the Amended Layout should be authorised with the following conditions:

- The EMPr (Appendix E) must be revised once an EA is issued to ensure that all required Conditions of Authorisation are included
- The EMPr must be implemented for both Cluster A and Cluster B and each respective EA owner will be responsible for the implementation.
- The EMPr must be included in all contract documentation for all phases of the implementation.
- The scale, form and style, and colour of the components of onsite substation structure should be compatible with existing Eskom Substations.

## 12 OATH OF EAP UNDERTAKING ASSESSMENT

I, Johann Georg Kilian, as the appointed EAP hereby declare/affirm:

- I act as the independent environmental assessment practitioner in this application;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I will take into account, to the extent possible, the matters listed in Regulation 14 of the Regulations when preparing the application and any report relating to the application;
- I undertake to disclose to the applicant and the Competent Authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the Competent Authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the Competent Authority, unless access to that information is protected by law, in which case it will be indicated that such information exists and will be provided to the Competent Authority;
- I will perform all obligations as expected from an environmental assessment practitioner in terms of the Regulations;
- I am aware of what constitutes an offence in terms of Regulation 48 and that a person convicted of an offence in terms of Regulation 48(1) is liable to the penalties as contemplated in Section 49B of the Act; and
- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations.

Signature of the EAP:

Name of Company:

  
Terramanzi Group

Date:

July 2021

