The fossil bone finds in the Dorbank Formation are generally the scattered, disarticulated and sometimes fragmented larger limb bones of antelopes and zebra. Pans and vleis/seep deposits, with greater fossil potential, may occur along buried drainage lines within the Dorbank Formation. Most finds have been at lower elevations in diamond-mine pits and little is known of this formation and its fossils at higher elevations and in this region of the coastal plain. Fossil finds could prove to be a scientifically significant addition to the poorly-known later mid-Quaternary fossil fauna of Namaqualand.

The calcrete-floored Zonnekwa Valley has very likely hosted pans during wetter climate spells in the past. It is possible that some pan deposits may remain, or fossils that have been eroded from them by wind deflation. The calcrete is assumed to have formed within the upper part of an older aeolianite formation. As the capping calcrete has formed along a persistent palaeosurface, fossil bones are more prevalent within it and are expected to be of earlier Quaternary age.

Although Pether (2020) considers fossil finds to be unlikely, he does note that any finds made could be scientifically significant in the interpretation of the local geological stratigraphy.

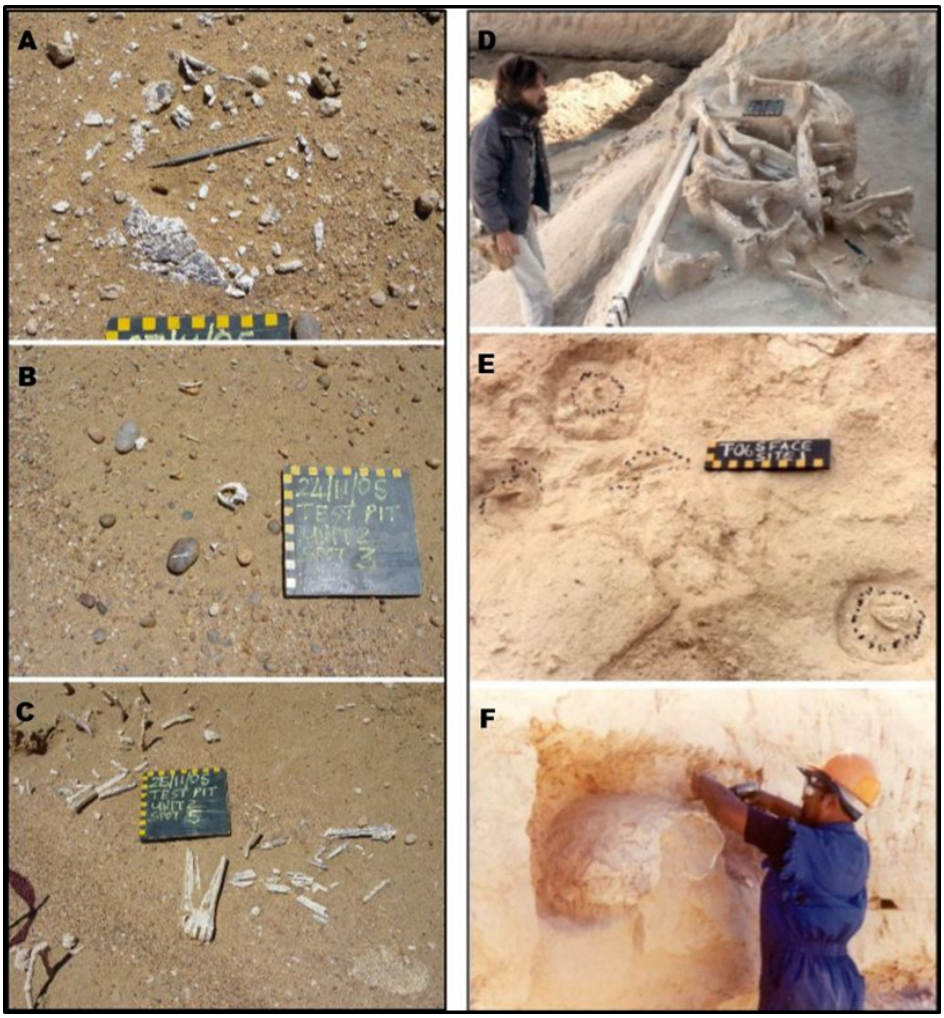


Figure B.67: Examples of *in situ* fossil finds in aeolianites. A & B – ambient fossils in aeolianites, tortoise (A) and rodent (B). C – bovid (antelope) limb bone. D – hyaena bone stash in a burrow. E – poorly visible bones in pedocrete. F – giant tortoise.

B.17.1Screening Tool Description and Site Verification-Palaeontology

A palaeontological specialist was subcontracted to provide a specialist palaeontological study which is included as Appendix 4 in the HIA (Appendix C.6 of this BA Report). There were no other relevant sources of information used for the site sensitivity verification.

The palaeontological desktop study found the study area to be of generally low sensitivity which largely confirms the screening tool map (Figure B.68).

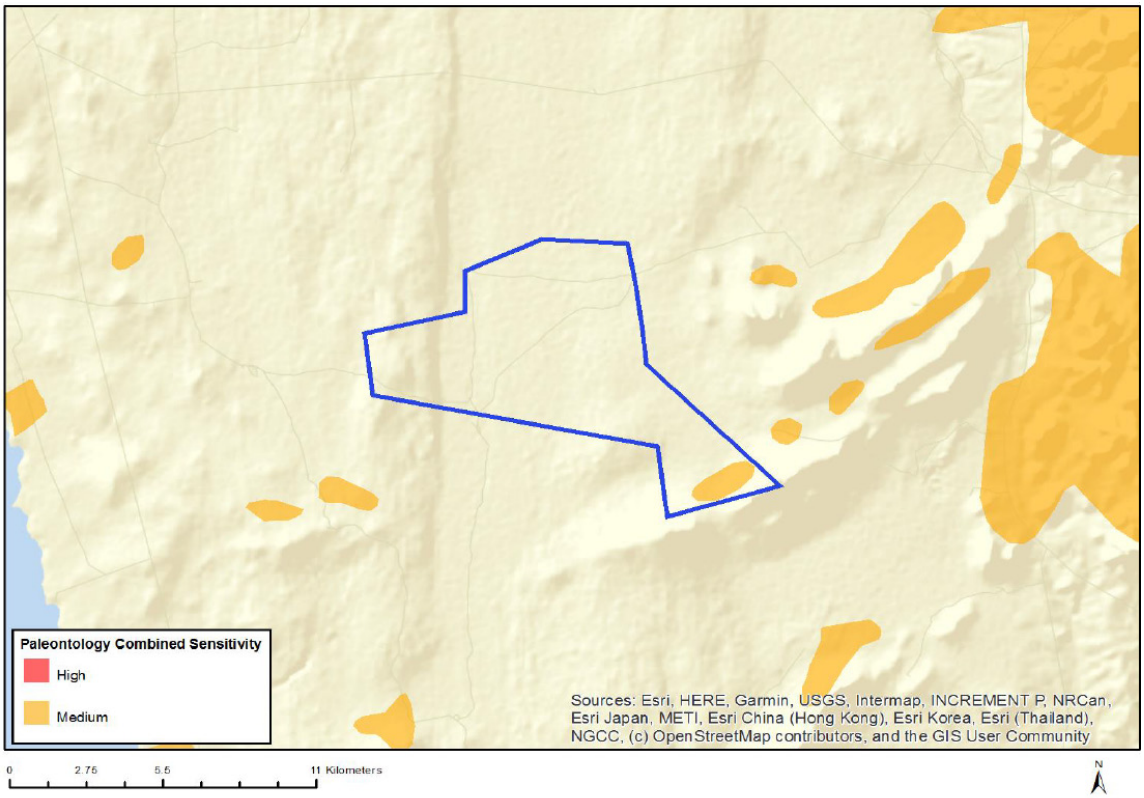


Figure B.68: The Screening Tool map showing the site to be of medium to low 'palaeontological' sensitivity.

B.18 Agriculture and Soils

The Agriculture Compliance Statement (Appendix C.7 of the BA Report) notes that the farms are located within a sheep farming agricultural region and land use for the farms and surrounding area is grazing only. Soils are predominantly deep to moderately deep, very sandy soils on underlying hardpan carbonate and sometimes clay. The major limitations to agriculture are the severely limited climatic moisture availability and the sandy soils with low water holding capacity. As a result of these limitations, the agricultural use of the study area is limited to low intensity grazing only. There is no cultivation or any history of cultivation on the farm. Apart from fences, there is no agricultural infrastructure on the site. There are no buildings on the site.

The Screening Tool classifies agricultural sensitivity according to two criteria i.e. the cultivation status and the land capability. All cultivated land is classified as high sensitivity (or very high sensitivity). This is because there is a scarcity of arable production land in South Africa, in terms of how much is required for food security.

Uncultivated land is classified by the Screening Tool in terms of the land capability. Land capability is defined as the combination of soil, climate and terrain suitability factors for supporting rain fed agricultural production. It is an indication of what level and type of agricultural production can sustainably be achieved on any land. The higher land capability classes are suitable as arable land for the production of cultivated crops, while the lower suitability classes are only suitable as non-arable grazing land, or at the lowest extreme, not even suitable for grazing. In 2017, the then DAFF released updated and refined land capability mapping across the whole of South Africa; which has greatly improved the accuracy of the land capability rating for any particular piece of land anywhere in the country. The new land capability mapping divides land capability into 15 different categories with 1 being the lowest and 15 being the highest. Values of below 8 are generally not suitable for production of cultivated crops. This land capability data is used by the Screening Tool.

The proposed project area is classified with a predominant land capability evaluation value of 5, although it varies from 4 to 6 across the site. Agricultural limitations that result in the low land capability classification are predominantly due to the very limited climatic moisture availability, with sandy soils as an additional factor. These factors render the site unsuitable for any kind of cultivation and limit it to low density grazing only.

The long-term grazing capacity of the site is low at 45 hectares per large stock unit.

B.18.1Screening Tool Description and Site Verification

The proposed site is identified by the Screening Tool as being of predominantly low agricultural sensitivity, with only very limited patches of medium sensitivity, and with no higher sensitivity than moderate. A map of the proposed study area overlaid on the Screening Tool sensitivity is shown in Figure B.69 below.

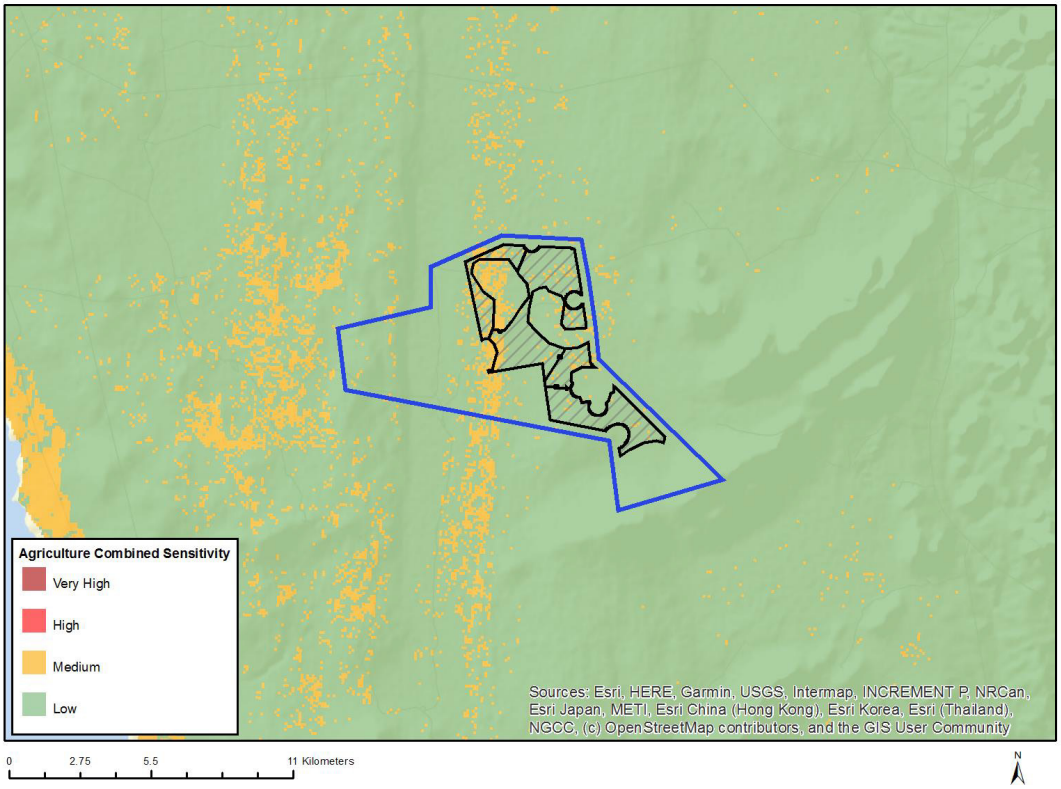


Figure B.69: The project study area for the proposed Komas WEF (outlined in blue) overlaid on agricultural sensitivity as identified by the Screening Tool (low = green; medium = yellow; red = high).

The agricultural sensitivity, as identified by the Screening Tool, is confirmed by the Agriculture Compliance Statement (Appendix C.7 of the BA Report). The motivation for confirming the sensitivity is predominantly that the climate data (low rainfall and high evaporation) proves the area to be arid, and therefore of limited land capability. In addition, the land type data shows the dominant soils to be deep to moderately deep, very sandy soils on underlying hardpan carbonate and sometimes clay. The land of the study area, therefore, without doubt, corresponds to the definitions of the different Screening Tool sensitivity categories in terms of its land capability and cultivation status.

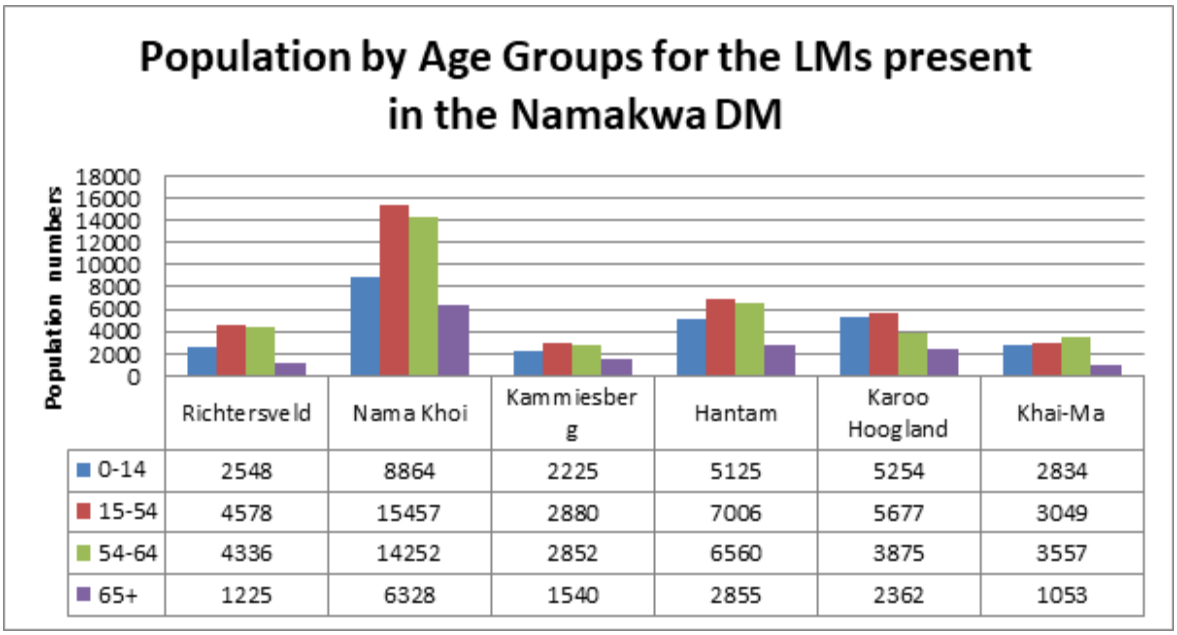
Refer to the Agriculture Compliance Statement (Appendix C.7 of the BA Report) for additional information.

B.19 Socio-Economic Character

The section below provides information on the Socio-Economic context of the study area. Please refer to the Socio-Economic Impact Assessment included in Appendix C.8 for more information on the Socio-Economic context of the study area.

Demographic and Economic Profile

The NKLM is part of the six local municipalities within the NDM within the Northern Cape Province. This municipality is the least populated within the Province according to the NDM's IDP (2017-2022). Figure B.70 shows the age group distribution of the population present within the NDM, shown via the representative of each Local Municipality. In addition, the NKLM has the highest population group within the 15-54 and 54-64 age groups. The overall dominant age group within the NDM is the 15-54 age group, which, according to the Namakwa DM's IDP, shows that within the DM there is need for job creation and new employment opportunities.



	Richtersveld	Nama Khoi	Kammiesberg	Hantam	Karoo Hoogland	Khai-Ma
0-14	2548	8864	2225	5125	5254	2834
15-54	4578	15457	2880	7006	5677	3049
54-64	4336	14252	2852	6560	3875	3557
65+	1225	6328	1540	2855	2362	1053

Figure B.70. Population age by age groups for the LMs present within the Namakwa DM (NKLM IDP, 2019/20)

Within the NDM, several sectors contribute to the municipality's economy and the Gross Domestic Product (GDP). These sectors include agriculture, mining, electricity, construction and trade. From 2004 to 2014, most of these sectors have seen growth and the NKLM remains the largest contributor to the economy in the District (Figure B.71).

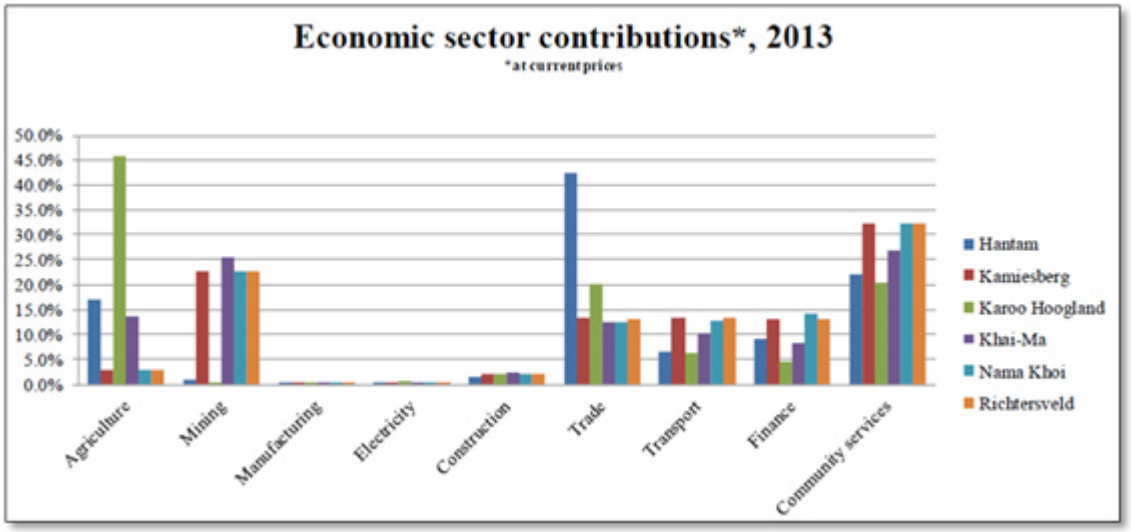


Figure B.71. Sectors contributing to the LM's local economies in 2013

Kleinzee

According to a Mail and Guardian article in 2011, Kleinzee was established as a mining town in 1926. The town was supported by the mining company, De Beers, through the supply of free services such as water and electricity as well as 25 recreational clubs including a golf course, tennis courts and a swimming pool. At the peak of the mine, it was estimated that a million carats of diamonds were mined in the area per year. In the 1980's it was estimated that 3 000 people were employed in Kleinzee and the population was close to 6 000 people. In 2007, De Beers significantly scaled down their operations in the town and linked to this, residents lost their jobs and moved away. De Beers has subsequently sold their Namaqualand Mines to Transhex in 2011 and only a small amount of mining is still occurring in the area, approximately 100 000 carats a year. Rehabilitation efforts by Transhex are however still providing jobs to a limited number of residents. Within the town, most of the houses are empty and limited services are still available (Stilwell, 2011). The Cape Times noted in 2013 that only 10 children were enrolled at the town's preprimary school and 50 children in the primary school. Kleinzee does not have a high school or hospital (Dolley, 2012). According to the census data of 2011, Kleinzee had a total population of 728, with an average household size of 1,9 (StatsSA, 2013).

Komaggas

Komaggas is named after a tributary of the Buffelsrivier. Historically the area was established as a station of the London Missionary Society in 1829. According to the census data of 2011, Komaggas has a population size of 3 116 with an average household size of 3,7 (StatsSA, 2013). According to the Nama Khoi SDF, because of the low population threshold and isolation of Komaggas, development strategies should be focused on developing human capital. For instance, it would not be feasible to develop schools and hospitals in Komaggas and as such mobile services such as clinics and libraries should be the main focus for investment. Learners should be transported to Springbok's schools.

Based on the demographic profiles of Kleinsee and Komaggas, the following comparisons can be made (as shown in the figures below). The majority of the residents in both towns are coloured (Figure B.72). As shown in Figure B.73, the majority of the people living in Kleinsee are in the age group between 45-49, with the second largest group of age 20 - 24. Compared to Kleinsee, the

majority of the Komaggas population is aged between 0 – 29 years which shows a much younger population group. The lowest percentage of people in Komaggas is in the 35 – 39 age group (Figure B.73). In terms of the highest education level reached by individuals within Kleinsee and Komaggas; the majority of the population in Kleinsee has completed secondary school, while the majority of residents in Komaggas has some secondary school grades completed (Figure B.74) (Laurie, 2018).

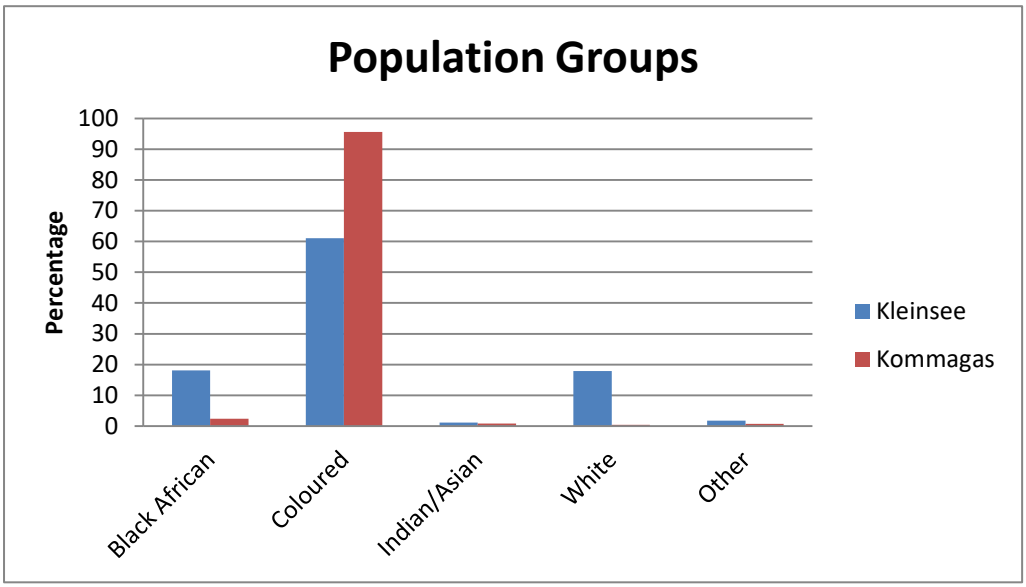
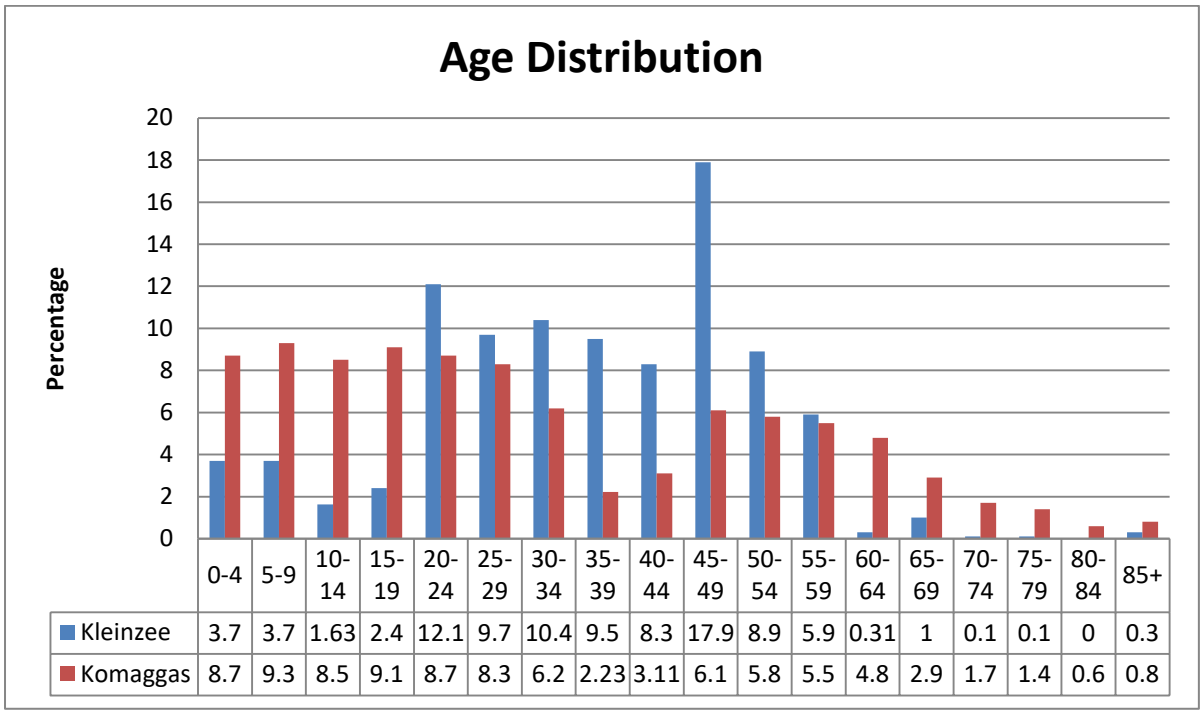


Figure B.72. Population groups residing within Kleinsee and Komaggas (2011) (StatsSA, 2013).



	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Kleinzee	3.7	3.7	1.63	2.4	12.1	9.7	10.4	9.5	8.3	17.9	8.9	5.9	0.31	1	0.1	0.1	0	0.3
Komaggas	8.7	9.3	8.5	9.1	8.7	8.3	6.2	2.23	3.11	6.1	5.8	5.5	4.8	2.9	1.7	1.4	0.6	0.8

Figure B.73. Age distribution within Kleinzee and Komaggas (2011) (StatsSA, 2013).

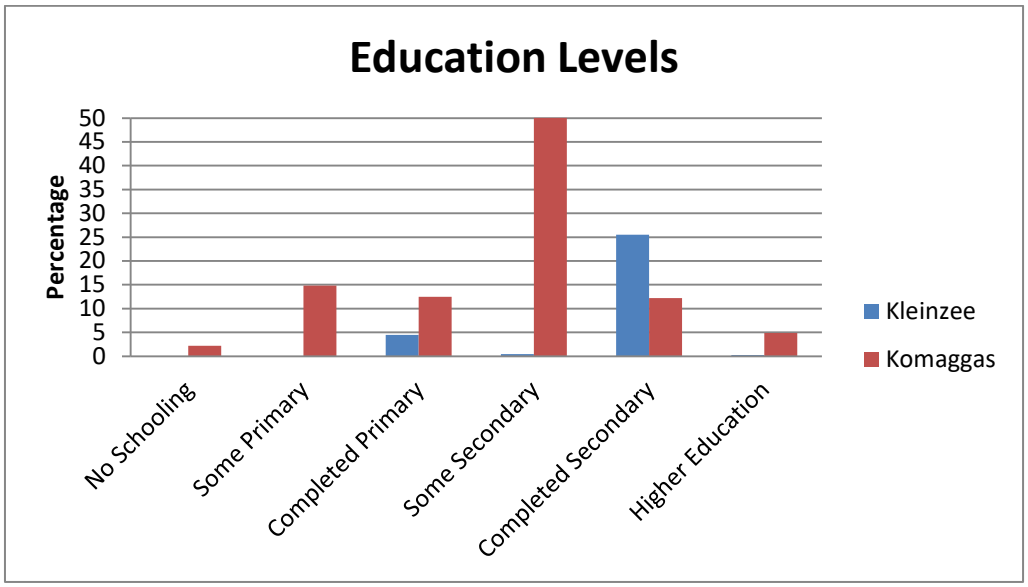


Figure B.74. Highest education levels achieved by population in Kleinzee and Komaggas (2011) (StatsSA, 2013).

According to the Community Survey (2007) included in the Nama Khoi IDP in 2001, the unemployment rate in Kleinzee was 5% and 41% for Komaggas. The Labour Participation Rate, which refers to the measure of the economy's labour force who is either employed or actively looking for work, was 89% and 68% for Kleinzee and Komaggas, respectively (StatsSA, 2008).

B.20 Civil Aviation and Defence

As required by GN 320, Civil Aviation and Defence Site Sensitivity Verifications were compiled. These are included in Appendices C.12 and C.13 respectively of this BA Report. Overall, the proposed project area falls within a low sensitivity area from a Civil Aviation and Defence perspective.

Civil Aviation

The site visit undertaken by the EAP on 29 September 2020 confirmed that the proposed project site is dominated by natural vegetation and that there are no areas of cultivation present on site. There are a few farmsteads on site. No civil aviation installations were found within the proposed project assessed area and footprint for the Komas WEF. According to the VIA, much of the area is characterised by natural vegetation which is dominated by Karoo and Fynbos shrubland.

The Air Traffic and Navigation Services SOC Limited (ATNS) data has confirmed that the Kleinsee Licenced Aerodome is located about 21 km from the closest point of the WEF, towards the north west. The ATNS data further notes that Area Navigation Routes intersect with the 30 km radius of the project area, however none intersect with the actual Komas WEF project site. In terms of airspaces, the area overlaps the Johannesburg Area West airspace. The proposed wind turbines will have a maximum HH of 200 m from the ground and the wind measurement monitoring mast extends approximately 120 m in height from ground level.

The Screening Tool also shows the Kleinsee Aerodome, with a high sensitivity within 8 km from the aerodome, and medium sensitivity allocated to the area extending between 8 and 15 km from the aerodome. These sensitivities do not intersect with the proposed Komas WEF assessed area.

Most of the features noted above are in line with the findings of the Phase 1 and Phase 2 Wind and Solar SEA Reports.

Figure B.75 indicates the location of the civil aviation features noted above, which informed this Site Sensitivity Verification.

The proposed project site was determined and verified to be of low sensitivity (as it relates to civil aviation). This confirms to the findings of the Screening Tool which indicates the area to be of low sensitivity in terms of civil aviation (Figure B.76).

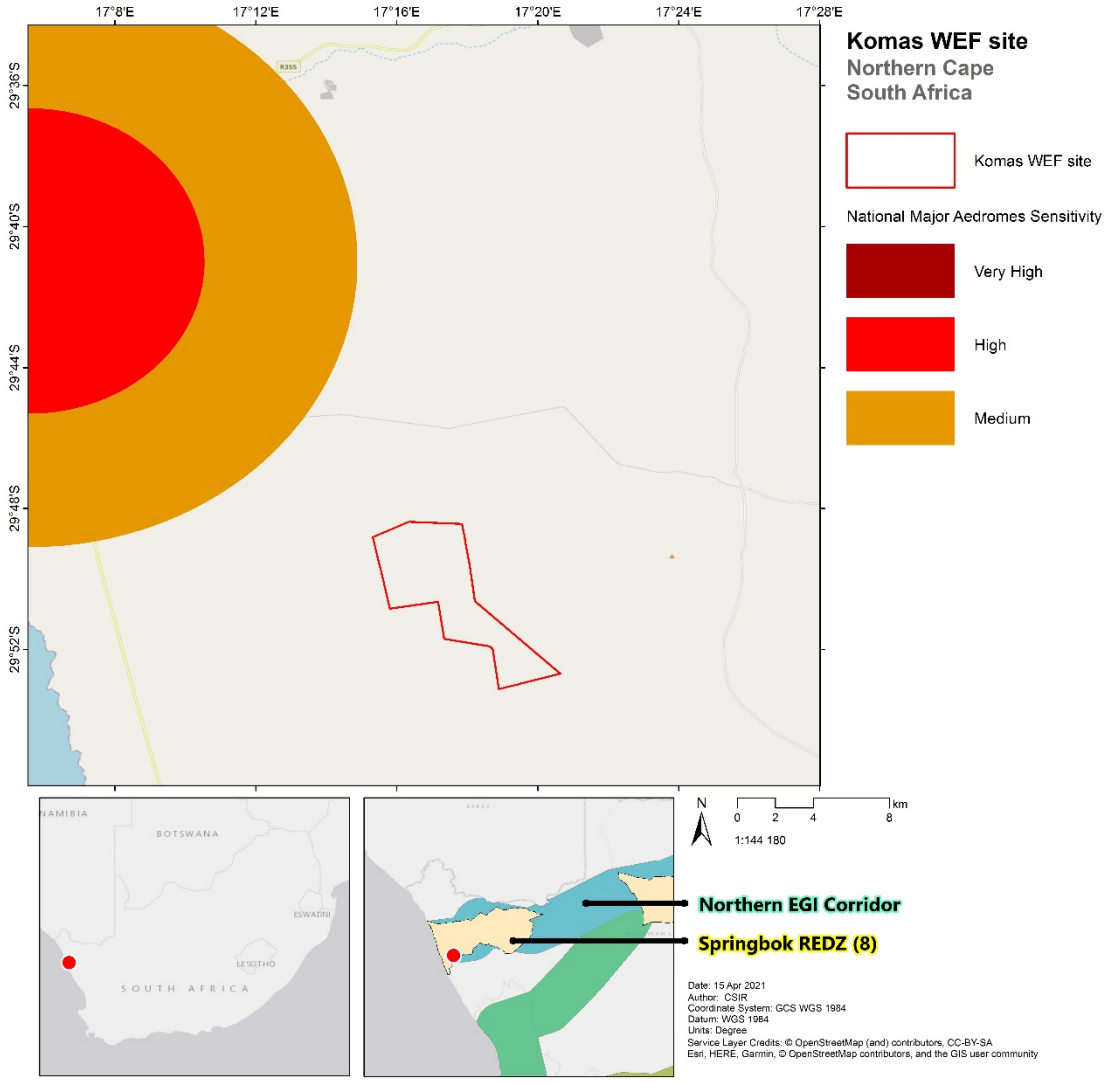


Figure B.75: Civil Aviation Features relative to the proposed project site based on the site visit undertaken by the EAP on 29 September 2020 and existing databases.

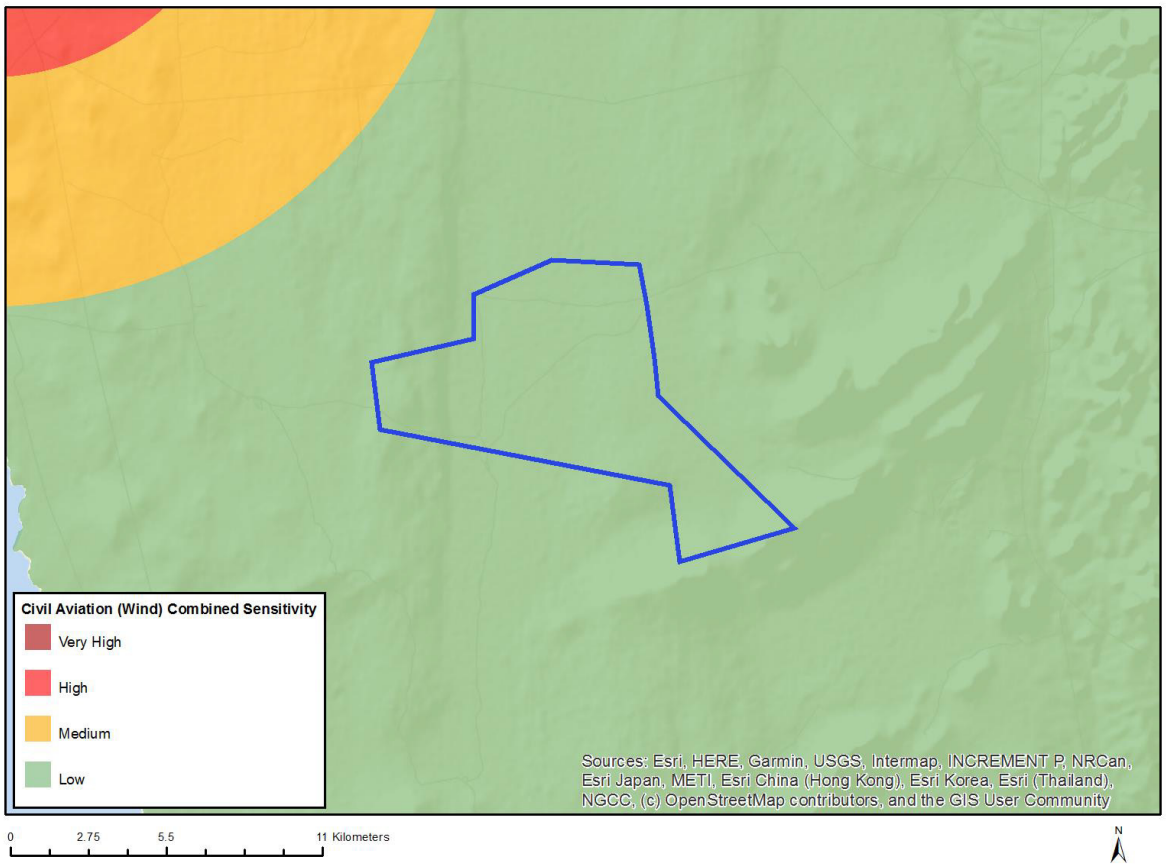


Figure B.76: Screening Tool Map showing the Komas WEF Assessed Area in terms of Civil Aviation Sensitivity.

Defence

The site visit undertaken by the EAP on 29 September 2020 confirmed that the proposed project site is dominated by natural vegetation and that there are no areas of cultivation present on site. There are a few farmsteads on site. No defence installations were found within the proposed project assessed area and footprint for the proposed Komas WEF. According to the VIA, much of the area is characterised by natural vegetation which is dominated by Karoo and Fynbos shrubland.

The ATNS data does not reflect any defence installations within the proposed project area or within a 30 km radius. The Screening Tool also does not show any defence installations in the proposed project area, and denotes the area as of low sensitivity (Figure B.77). This is in line with the findings of the Phase 1 and Phase 2 Wind and Solar SEA Reports.

Refer to Appendix B of the Defence Site Sensitivity Verification in Appendix C.13 for a letter of no objection from the Department of Defence (dated 14 October 2020), which confirms that the proposed Komas WEF project area is not a concern from a defence perspective.

The proposed Komas WEF project site was determined and verified to be of low sensitivity (as it relates to defence installations).

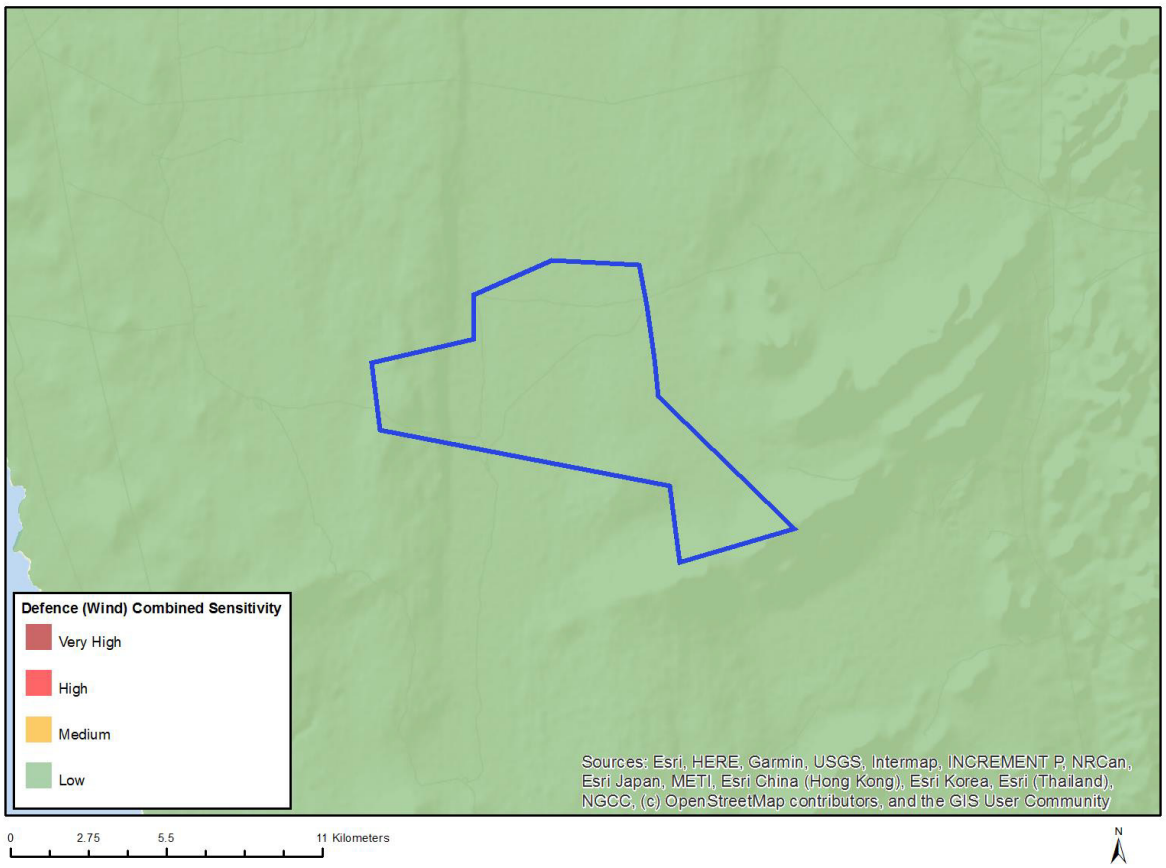


Figure B.77: Screening Tool Map showing the Komas WEF Assessed Area in terms of Defence Sensitivity.

SECTION C: PUBLIC PARTICIPATION

C.1 Introduction to the Public Participation Process

This section provides an overview of the tasks undertaken during the BA, with a particular emphasis on providing a clear record of the Public Participation Process (PPP) that is being followed. An integrated PPP was initially proposed and undertaken for the four separate BA processes (i.e. for the proposed Komas and Gromis WEFs and the associated electrical infrastructure projects to support the proposed Komas and Gromis WEFs). Therefore, integrated site notices were placed and integrated pre-application meetings were also held with the DEFF, SANParks and Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (DAEARDLR) formerly known as the Department of Environment and Nature Conservation (DENC) where the proposed projects were discussed jointly. However, due to delays on some of the projects, it is recommended that separate BA processes be undertaken for the four proposed projects as discussed above. Where possible and feasible, joint meetings will still be held with Stakeholders, Organs of State and Interested and Affected Parties (I&APs), as relevant.

The integrated PPP for the proposed projects was initially recommended due to the close proximity of the sites (i.e. the proposed projects will take place within the same geographical area) and that the proposed projects entail the same type of activity (i.e. generation of energy using a renewable source (i.e. wind), and distribution of electricity via power lines).

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

An effective PPP could therefore result in stakeholders working together to produce better decisions than if they had worked independently. The DEAT guideline states the following in terms of PPP:

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

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

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

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

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

The DEA (2017), Public Participation Guideline in terms of the NEMA EIA Regulations, 2014, as amended, was also considered during this BA process.

The key steps in the PPP for the BA is described below. This approach is structured in line with the requirements of Chapter 6 (PPP) of the NEMA EIA Regulations, 2014, as amended (i.e. GN R326), as well as the approved Public Participation Plan, as described below. Various mechanisms will be undertaken to provide notice to all potential and registered I&APs of the proposed project, as described below.

The BA Report is currently being released to I&APs, Stakeholders and Organs of State (including the National DEFF) for a 30-day commenting period. The Application for EA will be submitted to the National at the same time as the Draft BA Report.

C.2 Requirement for a Public Participation Plan

On 5 June 2020, the Minister of Forestry, Fisheries and the Environment issued Directions in terms of regulation 4 (10) of the Regulations issued by the Minister of Cooperative Governance and Traditional

Affairs in terms of section 27(2) of the Disaster Management Act, 2002 (Act 57 of 2002). These Directions were published in GG 43412, GN 650 on 5 June 2020, regarding measures to address, prevent and combat the spread of COVID-19 relating to national environmental management permits and licences.

Regulation 5.1 of GN 650 states that Authorities responsible for the processing of applications contemplated in the NEMA EIA Regulations, 2014, as amended, will be receiving such applications from 5 June 2020 and will receive and process applications and issue decisions in the manner as set out in Annexure 2 of GN 650. Regulation 5.2 of GN 650 states that Annexure 3 includes additional requirements in respect of the provision, supporting or obtaining of services contemplated in Regulation 5.1.

Annexure 3 of GN 650 states that an EAP must:

- Prepare a written Public Participation Plan, containing proposals on how the identification of and consultation with all potential I&APs will be ensured in accordance with Regulation 41(2)(a) to (d) of the NEMA EIA Regulations, 2014, as amended, or proposed alternative reasonable methods as provided for in regulation 41(2)(e), for purposes of an application and submit such plan to the competent authority; and
- Request a meeting or pre-application discussion with the competent authority to determine the reasonable measures to be followed to identify potential I&APs and register IA&Ps for purposes of conducting public participation on the application requiring adherence to Chapter 6 of the NEMA EIA Regulations, 2014, as amended, as set out in the Public Participation Plan and obtain agreement from the competent authority on the Public Participation Plan.

GN 650 also states that for new applications, the Public Participation Plan agreed with the competent authority must be annexed to the application form.

The Public Participation Plan required in terms of GN 650 was submitted to the DEFF via email on 1 December 2020 and then approved by the DEFF on 3 December 2020. Refer to Appendix D.1 of this BA Report for a copy of the Public Participation Plan, Appendix D.2 for proof of submission of Public Participation Plan to the DEFF, and Appendix D.3 for a copy of DEFF's Approval of the Public Participation Plan. The PPP is being undertaken in compliance with the Public Participation Plan.

C.3 Pre-Application Meetings and Consultation with the DEFF

Pre-application meetings with DEFF: Integrated Environmental Authorisations

1. First Pre-application meeting held on 18 August 2020

A Pre-Application Meeting took place with the Competent Authority, the DEFF, on 18 August 2020 (Reference Number: 2020-08-0001), in order to discuss and agree on various aspects with the DEFF prior to the application for EA being submitted and prior to the release of the Draft BA Report for comment. The following points were discussed with the DEFF:

- An overview of the project description of the proposed Komas WEF and associated infrastructure;
- Discussion and confirmation on the specialist studies to be undertaken as part of the BA process;
- Discussion and confirmation of the proposed approach and period of the pre-construction bat monitoring at the Komas WEF site.

- Discussion on the findings and outcomes of the Terrestrial Biodiversity offset studies which were compiled by Mr Simon Todd of 3Foxes Biodiversity Solutions for the proposed Komas WEF, and to confirm the way forward regarding this aspect.
- Discussion and confirmation of the proposed Public Participation Plan which will be submitted to DEFF for approval in light of the Directions issued by DEFF on 5 June 2020 in GN No. 650 (regarding measures to prevent the spread of COVID-19 relating to National Environmental Management permits and licences).
- Discussion and confirmation of the proposed schedule for the BA process.
- Discussion on the way forward.

2. Second Pre-application meeting held on 7 October 2020

A second pre-application meeting was also held with the DEFF on 7 October 2020. The following points were discussed with the DEFF at this second pre-application meeting:

- Further discussion and update on the proposed Biodiversity mitigation strategy and the implementation thereof with the landowners. Mr Simon Todd of 3Foxes Biodiversity Solution's updates to the Biodiversity Offset Analysis Report to address the comments raised at the first pre-application meeting.

  Mr Todd presented the following:
  - Proposed mitigation strategies to be implemented for the proposed Komas (and Gromis which is subject to a separate application process) WEFs and the proposed enforcement thereof; and
  - Confirmation on the way forward regarding the proposed mitigation strategies for the proposed Komas (and Gromis) WEFs.

- Discussion and confirmation regarding any Wake Effect requirements for the Komas (and Gromis) WEF BAs.
- Discussion and confirmation of the scope of the Avifaunal Assessments to be undertaken for the proposed Komas (and Gromis) WEF BAs and the sign-off thereof by a SACNASP registered Avifaunal specialist.
- Provide feedback from SABAA in relation to the lost data on the 110 m mast at the proposed Komas WEF site.
- Discussion and confirmation of the proposed PPP to be undertaken.
- Discussion and confirmation of the proposed schedules of the BA processes.
- Discussion on the way forward.

Refer to Appendix H.1 of this BA Report for a copy of the Pre-Application Meeting Request Forms submitted to the DEFF (for the first and second meeting held on 18 August and 7 October 2020 respectively); Appendix H.2 for copies of the presentations delivered at the said Pre-Application Meetings; Appendix H.3 for copies of the Pre-Application Meeting Notes; as well as Appendix H.4 with copies of correspondence from the DEFF with approval of the Pre-Application Meeting Notes.

The Pre-Application Meeting Notes for the first pre-application meeting were submitted to the DEFF via email on 2 September 2020 and approved by the DEFF on 16 September 2020. The meeting notes for the second pre-application meeting were submitted to the DEFF via email on 27 October 2020 and approved by the DEFF on 5 November 2020.

The Public Participation Plan was therefore discussed with the DEFF during the Pre-Application Meetings held on 18 August and 7 October 2020 in order to facilitate the decision-making on the plan itself.

Pre-application meeting with DEFF: Biodiversity Conservation

In addition to the two pre-application meetings discussed above, a separate pre-application meeting was also held with the Biodiversity Conservation section of DEFF on 15 December 2020. The purpose of the meeting was to introduce the proposed Komas WEF project and to provide feedback on biodiversity conservation issues and requirements (Appendix H.5 of this BA Report).

Pre-application meetings with SANParks and DAEARDLR

1. First Pre-application meeting held on 2 November 2020

A meeting was held with SANParks and DAEARDLR on 2 November 2020 (Appendix I). The purpose of the meeting was to introduce the proposed Komas WEF project and associated EGI and to provide feedback on *inter alia*, the impact assessment undertaken and to discuss components of appropriate mitigation biodiversity conservation issues and requirements for the proposed Komas WEF project. The proposed Gromis WEF and associated EGI, which will be assessed in separate BA processes, were also discussed at this meeting (but will not be discussed further here).

The agenda and meeting notes are included in Appendix I of this BA Report. Subsequent to the meeting Mr Conrad Geldenhuys of DAEARDLR provided comments on the proposed Komas WEF project. The comments, dated 11 December 2020, are included in Appendix I of this report.

The comments provided include the following:

- Lack of assessment of alternative sites;
- Mitigation hierarchy options such as alternative sites must also apply to REDZ developments;
- Landscape level impacts of developments in the broader region must be considered, in the cumulative sense;
- Mitigation options such as more conservative land management practices (grazing pressure reduction) on one property is valuable, but cannot adequately compensate for losses in broad-scale connectivity and ecosystem function or conservation area expansion;
- If the grazing system option is pursued further as mitigation, it is proposed that livestock grazing rather be terminated as a whole rather than enforcing a grazing pressure quantum. It would be complicated to enforce due to continuously changing goalposts as the veld changes between the seasons; and
- The location of the proposed Komas WEF is within the NC-PAES and the SANParks Namaqua National Park Potential Expansion envelope and Priority Natural Area Buffer Zone (as captured in the Namaqua National Park Management Plan). Assuming that Wind Energy developments are incompatible with conservation land this cannot be mitigated.

2. Second Pre-application meeting held on 27 January 2021

A second pre-application meeting was also held with SANParks, DAEARDLR and DEFF (Biodiversity Conservation) on 27 January 2021. The agenda and meeting notes are included in Appendix I of this BA Report.

The purpose of the meeting was to discuss comments received from SANParks (for the proposed Gromis WEF project), DAEARDLR and DEFF, and analyse acceptability of the proposed mitigation measures for the proposed Komas WEF (and Gromis WEF).

It was noted at the meeting that the Draft BA report will be submitted to SANParks, DAEARDLR and DEFF (Biodiversity Conservation) for further comment. These comments and other comments received following the release of the Draft BA report for comment will be included and responded to in the Issues and Responses Report of the Final BA Report. The Final BA Report will be submitted to the DEFF, in accordance with Regulation 19 (1) of the NEMA EIA Regulations, 2014, as amended, for decision-making in terms of Regulation 20 (however with a reduced 57-day timeframe as the proposed project falls within the Springbok REDZ (REDZ 8), as explained above). Following this meeting, comments were received from SANParks dated 15 February 2021. These comments are included in Appendix D.8 and are addressed in the Comments and Respoonses Report (C&RR) in Appendix D.9 of the BA Report. Please note the comments received from SANParks is in response to CSIR and ENERTRAG correspondence on the proposed development of the Komas (and Gromis) Wind Energy Facility and the responses thereto provided by the project team. It gives a number of overarching points which apply to both the Komas and Gromis projects (especially the Gromis WEF project which will be subject to a separate BA process). This letter must therefore be read in this context, i.e. that the comments mostly refer to the proposed Gromis WEF. The comments in this letter pertaining to the Komas WEF have been addressed in the C&RR as stated above.

C.4 Landowner Written Consent.

Regulation 39 (1) of the NEMA EIA Regulations, 2014, as amended, states that "*if the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land*".

Regulation 39 (2) of the NEMA EIA Regulations, 2014, as amended, further states that "*sub-regulation (1) does not apply in respect of: (a) linear activities; (b) activities constituting, or activities directly related to prospecting or exploration of a mineral and petroleum resource or extraction and primary processing of a mineral or petroleum resource; and (c) strategic integrated project as contemplated in the Infrastructure Development Act, 2014*".

The proposed Komas WEF constitutes a non-linear activity, and landowner consent is therefore required for the following land portions:

- Portion 1 of the Farm Zonnekwa No. 326; Surveyor General 21 Digit Code: C05300000000032600001;
- Portion 2 of the Farm Zonnekwa No. 328; Surveyor General 21 Digit Code: C05300000000032800002;
- Portion 3 of the Farm Zonnekwa No. 328: Surveyor General 21 Digit Code: C05300000000032800003;
- Portion 4 of the Farm Zonnekwa No. 328: Surveyor General 21 Digit Code: C05300000000032800004; and
- Portion 4 of the Farm Kap Vley No. 315: Surveyor General 21 Digit Code: C05300000000031500004.

Written consent has been obtained from the landowners of these farm portions on which the proposed Komas WEF (i.e. non-linear infrastructure) is proposed to be located. The written consent has been included as an appendix to the Application for EA, which has been submitted to the DEFF, together with this Draft BA Report for comment.

The access road leading to the proposed Komas WEF, will be upgraded and potentially widened, however landowner consent is not legally required in terms of Regulation 39 of the NEMA EIA Regulations, 2014, as amended, as the access road constitutes a linear activity.

C.5 Site Notice Boards

One specific mechanism of informing I&APs of the proposed project includes the placement of site notice boards. Regulation 41 (2) (a) of the NEMA EIA Regulations, 2014, as amended, requires that a notice board providing information on the proposed project and BA process is fixed at a place that is conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of the site where the application will be undertaken or any alternative site.

Notice boards were placed at the entrances to the proposed project area, as well as at strategic locations, namely the Kleinsee Public Library, and well-known retail facilities in Kleinsee and in Komaggas. The site notice boards were placed on 29 September 2020. Table C.1 provides a breakdown of the locations at which the site notice boards were placed.

Table C.1. Site Notice Board Placement for the Proposed Komas WEF Project

Number	Locality / Description	Co-ordinates
1	Site Notice board placed at the entrance to the Komas site via the surfaced road between the R355 and Komaggas.	29°46'58.82"S and 17°23'50.91"E
2	Site Notice board placed at the entrance gate via the road that links Kleinsee to Komaggas.	29°49'26.85"S and 17°7'31.47"E
3	Site Notice board placed at Kleinsee Public Library.	29°40'48.66"S and 17° 4'12.97"E
4	Site Notice board placed at the entrance of the Hazra General Dealer in Kleinsee.	29°40'49.18"S and 17° 4'11.51"E
5	Site Notice board placed at the entrance of the Helpmekaar Kafee (Café) in Komaggas	29°47'44.40"S and 17°29'9.50"E

.

Site notice boards were placed in English and Afrikaans; and include the following information, in compliance with Regulation 41 (3) of the NEMA EIA Regulations, 2014, as amended:

- The details of the proposed project that are subjected to public participation;
- Explains that a BA procedure is applicable to the proposed project;
- The nature and location of the proposed project;
- Details on where further information on the BA project can be obtained; and
- The manner in which and the person to whom representations in respect of the BA Project can be made.

Refer to Appendix D.4 of this BA Report for copies and proof of placement of the site notice boards.

C.6 Newspaper Advertisement

Regulation 41 (2) (c) of the NEMA EIA Regulations, 2014, as amended, requires the placement of a newspaper advertisement in one local newspaper or any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of the NEMA EIA Regulations, 2014, as amended.

In line with this, in order to notify and inform the public of the proposed project, to invite I&APs to register on the project database, as well as to inform I&APs of the release of the BA Report for comment, the BA process has been advertised in a local newspaper at the commencement of the 30-day comment period for the BA Report. Specifically, the newspaper advertisement was placed in the "Plattelander" local newspaper in English and Afrikaans. The content of the newspaper advertisement complies with Regulation 41 (3) of the NEMA EIA Regulations, 2014, as amended. The newspaper advertisement also includes the details of the project website where information available on the proposed project can be downloaded from. Refer to Appendix D.5 of this BA Report for copies the content of the newspaper advertisements. Proof of placement of the newspaper advertisements will be included in the Final BA Report.

At this stage, there are no official Gazettes published specifically for the purpose of providing public notice of applications or other submissions made in terms of the NEMA EIA Regulations, 2014, as amended.

C.7 Determination of Appropriate Measures

Refer to the section below which provides a detailed outline of the measures taken to include all potential I&APs, stakeholders and Organs of State in the BA process.

In terms of Regulation 41 (2) (e) of GN R326, at this stage of the assessment process no persons have been identified as desiring but unable to participate in the process. Therefore, no alternative methods have been agreed to by the competent authority.. If during the BA Process, persons are identified as desiring but unable to participate due to illiteracy, disability or any other disadvantage, then the EAP can arrange focus-group meetings with the relevant persons via teleconference. Holding a teleconference can allow the EAP to verbally explain the project to the relevant person. The teleconference will be undertaken at no cost to the relevant person.

In line with Regulation 41 (2) (b) of GN R326 and prior to the commencement of the BA process (and advertising the EA Process in the local print media), an initial database of I&APs (including key stakeholders and Organs of State) was developed for the BA process. This was undertaken based on research. Appendix D.6 of this BA Report includes a copy of the I&AP Database.

In line with Regulation 41 (2) (b) of GN R326, the database includes the details of the following:

- Landowners of the affected farm portions;
- Occupiers of the affected farm portions;
- Landowners of the neighbouring adjacent farm portions;
- The municipal councillor of the ward in which the proposed project will be undertaken (Ward 8 of the NKLM) and relevant rate payer organisations (Nama Khoi Rate Payers Association);
- The municipality which has jurisdiction in the area (i.e. NKLM and the NDM);
- Relevant Organs of State that have jurisdiction in respect of any aspect of the activity; and

- Any other party as required by the competent authority.

The I&AP database contains, as a minimum, the competent authority (DEFF); relevant state departments (e.g. the DAEARDLR, DHSWS, DMRE, etc.); relevant organs of state (e.g. NKLM, NDM, Eskom SOC Ltd etc.); as well as potential and registered I&APs (e.g. landowners, neighbours, etc.).

The above stakeholders, Organs of State and I&APs have accordingly received written notification of the commencement of the BA process and release of the BA Report for comment.

While I&APs have been encouraged to register their interest in the project from the start of the process, following the public announcements, the identification and registration of I&APs is ongoing for the duration of the study. Stakeholders from a variety of sectors, geographical locations and/or interest groups are expected to show an interest in the proposed project, for example:

- Provincial and Local Government Departments;
- Local interest groups, for example, Councillors and Rate Payers associations;
- Surrounding landowners;
- Farmer Organisations;
- Environmental Groups and NGOs; and
- Grassroots communities and structures.

As per Regulation 42 of the GN 326, in terms of the electronic database, I&AP details will be captured and automatically updated as and when information is distributed to or received from I&APs. This ongoing record of communication is an important component of the PPP. It must be noted that while not required by the regulations, those I&APs proactively identified at the outset of the BA process will remain on the project database throughout the process and will be kept informed of all opportunities to comment and will only be removed from the database by request.

C.8 Approach to the PPP

In terms of Regulation 41 (6) of GN R326 the section below outlines the PPP for this assessment in order to provide potential I&APs, Stakeholders and Organs of State access to information on the project and the opportunity to comment at the various stages of the assessment process.

C.8.1 BA Report Phase - Review of the Draft BA Report

As noted above, the BA Report for the proposed project is currently being released to I&APs, Stakeholders and Organs of State for a 30-day commenting period. The section below summarises the PPP for the review of the BA Report.

- **Database Development and Maintenance**: In line with Regulation 41 (2) (b) of GN R326, an initial database of potential I&APs was developed for the BA process, and will be updated throughout the BA process.
- **Site Notice Board**: As noted in Section C (5) above, site notice boards were placed for the proposed project. A copy of the notice boards is included in Appendix D.4 of this BA Report.
- **Advertisement to Register Interest:** An advertisement was placed in the “Plattelander” in English and Afrikaans; at the commencement of the 30-day review period for the BA Report. A copy of the content of the advertisements is included in Appendix D.5 of this BA Report.

- **Letter 1 to I&APs (Commencement of the BA process)**: Written notification of the availability of the BA Report (i.e. Letter 1) was sent to all I&APs and Organs of State included on the project database via email, where email addresses are available. This letter was sent at the commencement of the 30-day review period on the BA Report, and included information on the project and notification of the release and availability of the report. Letter 1 was written in English and Afrikaans. Proof of email, as well as copies of the Letter 1 and emails sent will be included in the Final BA Report that will be submitted to the DEFF for decision-making.
- **Text Messaging**: SMS texts were also sent to all I&APs on the database, where cell phone numbers are available, to inform them of the proposed project and how to access the Draft BA Report.
- Where possible, communication will be made with the ward councillor to request that they send notifications of the project and report availability and executive summaries via their local networks (such as WhatsApp groups, Neighbourhood Watch groups, other social media mechanisms etc.).
- **Executive Summary of the BA Report**: An Executive Summary of the BA Report was emailed to I&APs on the database, and uploaded to the project website (https://www.csir.co.za/environmental-impact-assessment).
- **30-day Comment Period**: As noted above, potential I&APs, including authorities and Organs of State, were notified via Letter 1, of the 30-day comment and registration period within which to submit comments on the BA Report and/or to register on the I&AP database.
- **Availability of Information:** The Draft BA Report is currently being made available for a 30-day commenting period, and is being distributed to ensure access to information on the project and to communicate the outcome of specialist studies. The Draft BA Report has been uploaded to the project website (https://www.csir.co.za/environmental-impact-assessment) for I&APs to access it. As a supplementary mechanism, the Draft BA Report was also uploaded to other alternative web-platforms such as Dropbox or Google Drive (the platform to be used will be confirmed in Letter 1 to I&APs). If an I&AP cannot access the report via the project website, via the alternative web-platforms such as Dropbox or Google Drive, and if additional information is required (other than what is provided in the Executive Summary), then the I&AP can contact the EAP, who will then make an electronic copy available (where feasibly possible).
- **Comments Received**: A key component of the BA process is documenting and responding to the comments received from I&APs and the authorities. Copies of all comments received during the review of the Draft BA Report will be included as an appendix to the Final BA Report and in the Comments and Response Report.

C.8.2 Compilation of Final BA Reports for Submission to the DEFF

Following the 30-day commenting period of the BA Report and incorporation of the comments received into the report, the Final BA Report will be submitted to the DEFF for decision-making in line with Regulation 19 (1) (a) of the NEMA EIA Regulations, 2014, as amended. The report will be submitted electronically to the DEFF via the Novell S-Filer system, as recommended by the DEFF since June 2020.

In line with best practice, I&APs on the project database will be notified via Letter 2 via email (where email addresses are available) of the submission of the Final BA Report to the DEFF for decision-making. To ensure ongoing access to information, a copy of the Final BA Report that will be submitted for decision-making and the Comments and Response Report (detailing comments received during the BA Phase and responses thereto) will be placed on the project website (i.e. https://www.csir.co.za/environmental-impact-assessment). As a supplementary mechanism, the Final BA Report will also be uploaded to other alternative web-platforms such as Dropbox or Google Drive.

The Final BA Report that will be submitted for decision-making to the DEFF will include proof of the PPP that was undertaken to inform Organs of State, Stakeholders and I&APs of the availability of the Draft BA Report for the 30-day review (as explained above).

The DEFF will have 57 days from receipt of the Final BA Report (as opposed to 107 days as the proposed Komas WEF falls within the Springbok REDZ) to either grant or refuse EA (in line with Regulation 20 (1) of the NEMA EIA Regulations, 2014, as amended, and GN 114 of February 2018).

C.8.3 Environmental Decision-Making and Appeal Period

Subsequent to the decision-making phase, if EA is granted by the DEFF for the proposed project, all registered I&APs, Organs of State and stakeholders on the project database will receive notification of the issuing of the EA and the associated appeal period. The NEMA EIA Regulations, 2014, as amended, (i.e. Regulation 4 (1)) states that after the CA has a reached a decision, it must inform the Applicant of the decision, in writing, within 5 days of such decision. Regulation 4 (2) of the NEMA EIA Regulations, 2014, as amended, stipulates that I&APs need to be informed of the EA and associated appeal period within 14 days of the date of the decision. All registered I&APs will be informed of the outcome of the EA and the appeal procedure, as well as the respective timelines.

The distribution of the EA (should such authorisation be granted by the DEFF), as well as the notification of the appeal period, will include a letter (i.e. Letter 3 (Release of EA and Notification of Opportunity to Appeal)) to be sent via email to all registered I&APs, Stakeholders and Organs of State on the database, where email addresses are available. The letter will include information on the appeal period, as well as details regarding where to obtain a copy of the EA. A copy of the EA will be emailed with Letter 3. The EA will also be uploaded to the project website (i.e. https://www.csir.co.za/environmental-impact-assessment). SMS texts will also be sent to all I&APs on the database, where cell phone numbers are available, to inform them of the EA (should it be granted).

SECTION D: IMPACT ASSESSMENT

This section includes a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the construction phase, operational phase and decommissioning phase of the proposed Komas WEF, in line with the requirements of the NEMA EIA Regulations, 2014, as amended.

D.1 Approach to the BA: Methodology of the Impact Assessment

The identification of potential impacts includes impacts that may occur during the construction, operational and decommissioning phases of the proposed development. The assessment of impacts includes direct, indirect as well as cumulative impacts. In order to identify potential impacts (both positive and negative) it is important that the nature of the proposed project is well understood so that the impacts associated with the proposed project can be assessed. The process of identification and assessment of impacts includes:

- Determining the current environmental conditions in sufficient detail so that there is a baseline against which impacts can be identified and measured;
- Determining future changes to the environment that will occur if the activity does not proceed;
- Develop an understanding of the activity in sufficient detail to understand its consequences; and
- The identification of significant impacts which are likely to occur if the activity is undertaken.

The impact assessment methodology has been aligned with the requirements for BA Reports as stipulated in Appendix 1 (3) (1) (j) of the NEMA EIA Regulations, 2014, as amended, which state the following:

“A BA Report must contain the information that is necessary for the Competent Authority to consider and come to a decision on the application, and must include an assessment of each identified potentially significant impact and risk, including –

(i) cumulative impacts;
(ii) the nature, significance and consequences of the impact and risk;
(iii) the extent and duration of the impact and risk;
(iv) the probability of the impact and risk occurring;
(v) the degree to which the impact and risk can be reversed;
(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and
(vii) the degree to which the impact and risk can be mitigated”.

As per the then DEAT Guideline 5: Assessment of Alternatives and Impacts, the following methodology is applied to the prediction and assessment of impacts and risks. Potential impacts and risks have been rated in terms of the direct, indirect and cumulative:

- **Direct impacts** are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.
- **Indirect impacts** of an activity are indirect or induced changes that may occur as a result of the activity. These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.

- **Cumulative impacts** are impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.

The cumulative impacts have been assessed by identifying other REFs (i.e. nine proposed WEFs and five proposed solar PV facilities (including the hybrid one)) within 50 km of the proposed Komas WEF (see Table D.1 and Figure D.1). These facilities include projects which have received EA and projects for which applications have been submitted to the CA and where the EIAs or BAs are currently being conducted at the time when this BA process commenced.

The information was collected from the National DEFF REEA database, 2020 Quarter 4; as well as from the South African Heritage Resources Information System (SAHRIS). The proposed WEFs which are in the immediate vicinity of the proposed Komas WEF are the following:

- Kap Vley WEF (EA received on 25 October 2019);
- Namas WEF (EA received on 18 February 2019);
- Zonnequa WEF (EA received on 25 February 2019); and the
- Gromis WEF (BA specialist studies currently being undertaken).

Table D.1 provides more details and Figure D.1 provides an illustration of the proposed projects considered in the cumulative impact assessment.

Each specialist study in Appendix C of the BA Report contains feedback on the assessment of potential cumulative impacts. The specialists assessed such impacts based on their expertise and knowledge of similar projects and management actions.

A summary of the process flow followed in the cumulative impact assessment is provided below:

- A list of authorised Renewable Energy within a 50 km radius was identified based on research, SAHRIS and REEA.

- This resulted in 11 Renewable Energy Projects. Of these, nine are WEFs and two are solar PV projects.

- In addition to the above, the current project, i.e. the proposed Komas WEF, was also considered as part of the cumulative assessment.

- Considering all of the above, the cumulative impacts were then clearly defined, and where possible the size of the identified impact was quantified and indicated, i.e. hectares of cumulatively transformed land. With regards to the levels of transformation, the current state of the affected area was also taken into consideration. In most cases the actual development footprint of the nearby Renewable Energy developments could not be easily quantified or accessed spatially. For example, the REEA database contains land parcels, and not the footprints. Hence the land parcels were considered, which took into account the worst case. This allowed the determination of the following in the relevant specialist assessments:

    - The total affected land parcel area taken up by authorised renewable energy projects within the 50 km radius.

    - The total affected land parcel area of the proposed Komas WEF site.

- The total area within the 50 km radius around the proposed project.
- The total combined size of the land parcels affected by renewable energy projects as a percentage of the available habitat in the 50 km radius.

- Therefore, the assessment of cumulative impacts was based on the specialist and EAP's knowledge of similar approved Renewable Energy projects in the 50 km radius. In some cases, the specialists involved in this BA Process were also involved in some of the other Renewable Energy Projects within the 50 km radius, thus being well aware of the type of impacts and mitigation measures recommended. The specialists assessed such impacts based on their expertise and knowledge of similar projects and management actions. However, it is important to note that the assessment of cumulative impacts is not necessarily solely focused on an assessment of impacts linked to previously authorised similar developments and consideration of their mitigation measures, but also about the sensitivities of the land on which the projects take place. For example, from a heritage point of view, it is also about other heritage resources, the type of locations they could occur in, and any other developments that may have impacted on heritage resources.

Table D.1. Proposed renewable energy facilities within 50 km of the proposed Komas WEF which have been considered for the cumulative impact assessment

DEA Reference Number	PROJECT TITLE	APPLICANT	EAP	TECHNOLOGY	MEGAWATT	STATUS
12/12/20/2331/1 12/12/20/2331/1/AM1 12/12/20/2331/2 12/12/20/2331/3	Project Blue Wind Energy Facility Near Kleinsee within the Namakwa Magisterial District, Northern Cape Province. (Phase 1-3)	Diamond Wind (Pty) Ltd	Savannah Environmental Consultants (Pty) Ltd	Wind and Solar PV	150 MW Wind 65 MW Solar PV	Approved
12/12/20/2212	Proposed 300 MW Kleinzee WEF in the Northern Cape Province.	Eskom Holdings SOC Limited	Savannah Environmental Consultants (Pty) Ltd	Wind	300 MW	Approved
14/12/16/3/3/2/1046	The proposed Kap Vley WEF and its associated infrastructure near Kleinzee, Nama Khoi Local Municipality, Northern Cape Province.	Kap Vley Wind Farm (Pty) Ltd	Council for Scientific and Industrial Research	Wind	300 MW	Approved
14/12/16/3/3/1/1971	Proposed Namas Wind Farm near Kleinsee, Namakwaland Magisterial District, Northern Cape.	Genesis Namas Wind (Pty) Ltd	Savannah Environmental Consultants (Pty) Ltd	Wind	140 MW	Approved
14/12/16/3/3/1/1970	Proposed Zonnequa Wind Farm near Kleinsee, Namakwaland Magisterial District, Northern Cape.	Genesis Zonnequa Wind (Pty) Ltd	Savannah Environmental Consultants (Pty) Ltd	Wind	140 MW	Approved
12/12/20/2154	Proposed construction of the 7.2 MW Koingnaas Wind Energy Facility Within The De Beers Mining Area on the Farm Koingnaas 745 near Koingnaas, Northern Cape Province.	Just PalmTree Power Pty Ltd	Savannah Environmental Consultants (Pty) Ltd	Wind	7.2 MW	Approved

DEA Reference Number	PROJECT TITLE	APPLICANT	EAP	TECHNOLOGY	MEGAWATT	STATUS
12/12/20/1807	Proposed establishment of the Kannikwa Vlakte wind farm.	Kannikwa Vlakte Wind Development Company Pty Ltd	Galago Environmental cc	Wind	120 MW	Approved
12/12/20/1721 12/12/20/1721/AM1 12/12/20/1721/AM2 12/12/20/1721/AM3 12/12/20/1721/AM4 12/12/20/1721/AM5	The proposed Springbok Wind Energy facility near Springbok, Northern Cape Province.	Mulilo Springbok Wind Power (Pty) Ltd	Holland & Associates Environmental Consultants	Wind	55.5 MW	Approved
TBA	The proposed Gromis WEF and associated infrastructure near Kleinsee in the Northern Cape Province.	Genesis ENERTRAG Gromis Wind (Pty) Ltd	Council for Scientific and Industrial Research	Wind	200 MW	In process
14/12/16/3/3/1/416	Nigramoep Solar PV Solar Energy Facility on a site near Nababeep, Northern Cape.	South African Renewable Green Energy (Pty) Ltd	Savannah Environmental Consultants (Pty) Ltd	Solar PV	20 MW	In process

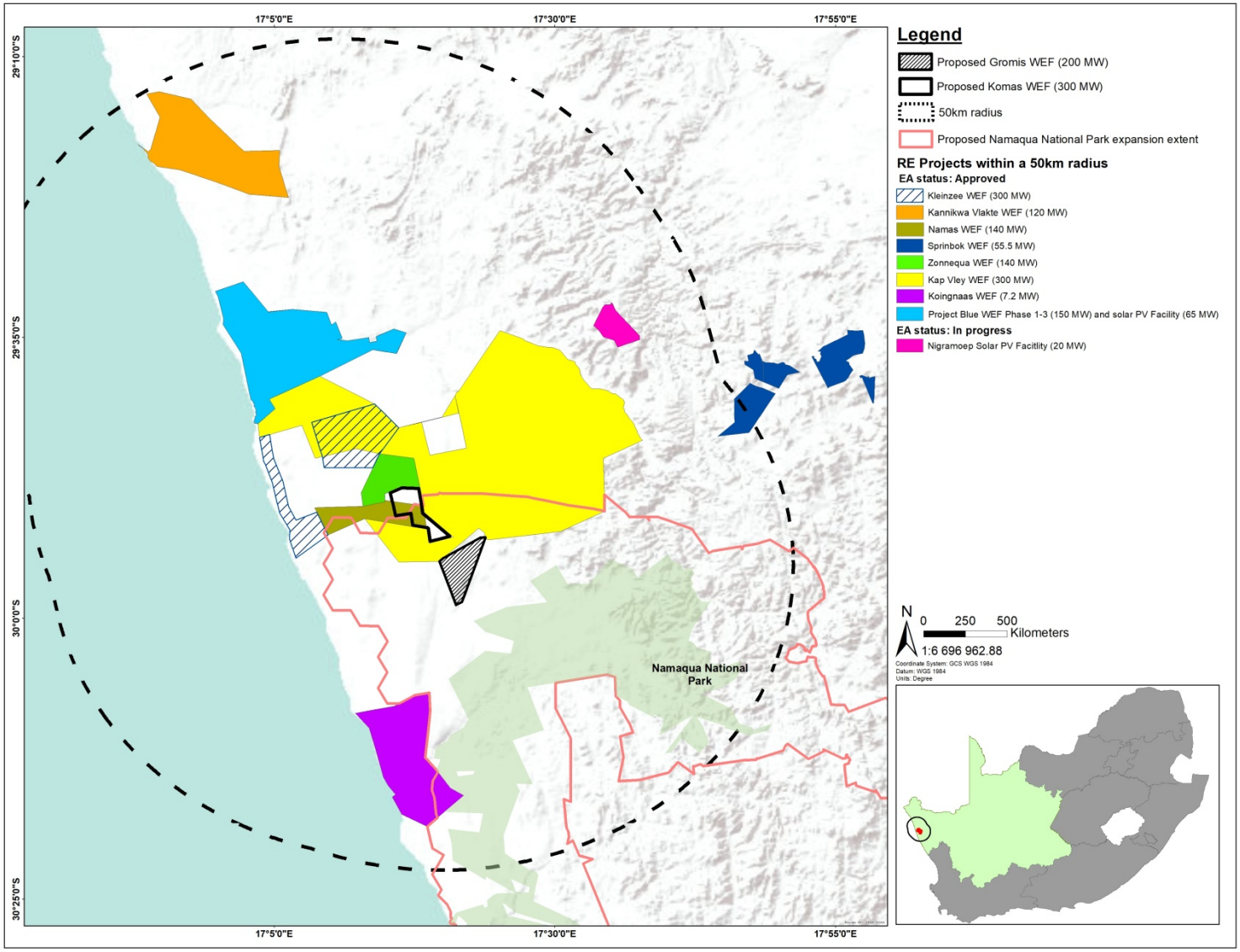


Figure D.1: Projects within the 50 km radius of the proposed Komas WEF considered for the Cumulative Impact Assessment

In addition to the above, the impact assessment methodology includes the following aspects:

Nature of impact/risk - The type of effect that a proposed activity will have on the environment.

Status - Whether the impact/risk on the overall environment will be:
- Positive - environment overall will benefit from the impact/risk;
- Negative - environment overall will be adversely affected by the impact/risk; or
- Neutral - environment overall not be affected.

Spatial extent – The size of the area that will be affected by the impact/risk:
- Site specific;
- Local (<10 km from site);
- Regional (<100 km of site);
- National; or
- International (e.g. Greenhouse Gas emissions or migrant birds).

Duration – The timeframe during which the impact/risk will be experienced:
- Very short term (instantaneous);
- Short term (less than 1 year);
- Medium term (1 to 10 years);
- Long term (the impact will cease after the operational life of the activity (i.e. the impact or risk will occur for the project duration)); or
- Permanent (mitigation will not occur in such a way or in such a time span that the impact can be considered transient (i.e. the impact will occur beyond the project decommissioning)).

Consequence – The anticipated consequence of the risk/impact:
- Extreme (extreme alteration of natural systems, patterns or Process, i.e. where environmental functions and Process are altered such that they permanently cease);
- Severe (severe alteration of natural systems, patterns or Process, i.e. where environmental functions and Process are altered such that they temporarily or permanently cease);
- Substantial (substantial alteration of natural systems, patterns or Process, i.e. where environmental functions and Process are altered such that they temporarily or permanently cease);
- Moderate (notable alteration of natural systems, patterns or Process, i.e. where the environment continues to function but in a modified manner); or
- Slight (negligible alteration of natural systems, patterns or Process, i.e. where no natural systems/environmental functions, patterns, or Process are affected).

Reversibility of the Impacts - the extent to which the impacts/risks are reversible assuming that the project has reached the end of its life cycle (decommissioning phase):
- High reversibility of impacts (impact is highly reversible at end of project life i.e. this is the most favourable assessment for the environment);
- Moderate reversibility of impacts;
- Low reversibility of impacts; or
- Impacts are non-reversible (impact is permanent, i.e. this is the least favourable assessment for the environment).

Irreplaceability of Receiving Environment/Resource Loss caused by impacts/risks – the degree to which the impact causes irreplaceable loss of resources assuming that the project has reached the end of its life cycle (decommissioning phase):

- High irreplaceability of resources (project will destroy unique resources that cannot be replaced, i.e. this is the least favourable assessment for the environment);
- Moderate irreplaceability of resources;
- Low irreplaceability of resources; or
- Resources are replaceable (the affected resource is easy to replace/rehabilitate, i.e. this is the most favourable assessment for the environment).

Using the criteria above, the impacts are further assessed in terms of the following:

Probability – The probability of the impact/risk occurring:
- Extremely unlikely (little to no chance of occurring);
- Very unlikely (<30% chance of occurring);
- Unlikely (30-50% chance of occurring)
- Likely (51 – 90% chance of occurring); or
- Very Likely (>90% chance of occurring regardless of prevention measures).

To determine the significance of the identified impact/risk, the consequence is multiplied by probability (qualitatively as shown in Figure D.2). This approach incorporates internationally recognised methods from the Intergovernmental Panel on Climate Change (IPCC) (2014) assessment of the effects of climate change and is based on an interpretation of existing information in relation to the proposed activity, to generate an integrated picture of the risks related to a specified activity in a given location, with and without mitigation. Risk is assessed for each significant stressor (e.g. physical disturbance), on each different type of receiving entity (e.g. the municipal capacity, a sensitive wetland), qualitatively (very low, low, moderate, high, and very high) against a predefined set of criteria (i.e. probability and consequence):

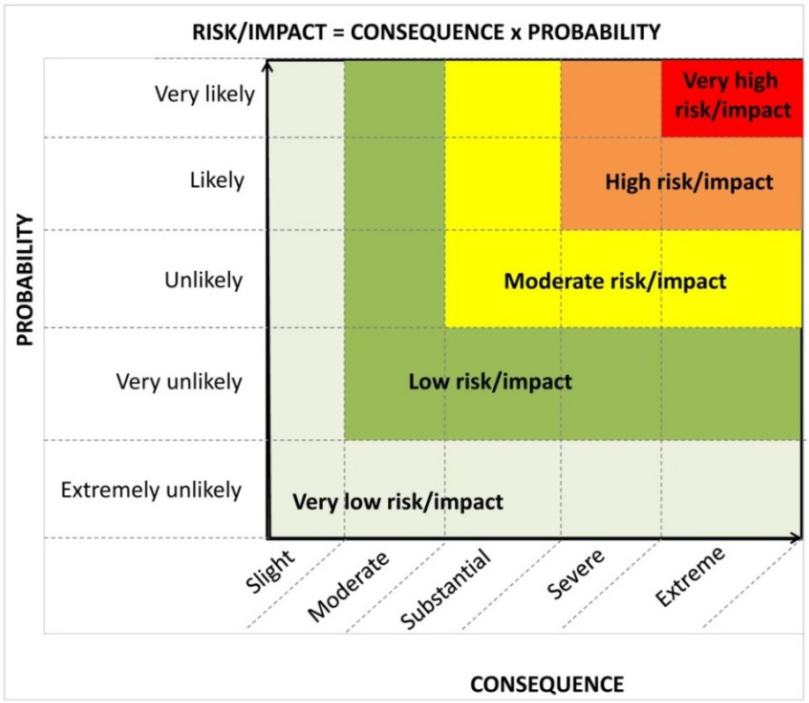


Figure D.2: Guide to assessing risk/impact significance as a result of consequence and probability

Significance – Will the impact cause a notable alteration of the environment?

- Very low (the risk/impact may result in very minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making);
- Low (the risk/impact may result in minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making);
- Moderate (the risk/impact will result in moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated);
- High (the risk/impact will result in major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making); and
- Very high (the risk/impact will result in very major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making (i.e. the project cannot be authorised unless major changes to the engineering design are carried out to reduce the significance rating)).

With the implementation of mitigation measures, the residual impacts/risks will be ranked as follows in terms of significance (based on Figure D.2):

- Very low = 5;
- Low = 4;
- Moderate = 3;
- High = 2; and
- Very high = 1.

Confidence – The degree of confidence in predictions based on available information and specialist knowledge:

- Low;
- Medium; or
- High.

Impacts have been collated into the EMPrs (Appendix G of the BA Report) and these include the following:

- Quantifiable standards for measuring and monitoring mitigatory measures and enhancements (as applicable). This includes a programme for monitoring and reviewing the recommendations to ensure their ongoing effectiveness.
- Identifying negative impacts and prescribing mitigation measures to avoid or reduce negative impacts. Where no mitigatory measures are possible this is stated.
- Positive impacts and augmentation measures have been identified to potentially enhance positive impacts where possible.

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

- Impacts are evaluated for the construction and operational phases of the development. The assessment of impacts for the decommissioning phase is brief, as there is limited understanding at this stage of what this might entail. The relevant rehabilitation guidelines and legal requirements applicable at the time will need to be applied;
- Impacts have been evaluated with and without mitigation in order to determine the effectiveness of mitigation measures on reducing the significance of a particular impact;

- The impact evaluation has, where possible, taken into consideration the cumulative effects associated with this and other facility/project which are either developed or in the process of being developed in the local area; and
- The impact assessment attempts to quantify the magnitude of potential impacts (direct and cumulative effects) and outline the rationale used. Where appropriate, national standards are used as a measure of the level of impact.

D.2 Assessment of Environmental Risks and Impacts

The issues and impacts presented in this section have been identified via the environmental *status quo* of the receiving environment (environmental, social and heritage features present on site - as discussed in Section B of this BA Report) and inputs provided in the specialist studies included in this BA report (Appendices C.1 – C.11). The impact assessments of the specialist studies undertaken to inform this BA have been summarised in this section. **It should be noted that unless otherwise stated (i.e. unless impacts are specified as positive), impacts identified and their associated significance are deemed to be negative.**

Refer to Appendix C.1 – C.11 of this report for the full specialist studies undertaken (including the Terms of Reference for each study). All proposed mitigation measures, as relevant, have been carried over into the EMPrs, included in Appendix G of this report.

D.2.1 Terrestrial Biodiversity

The Terrestrial Biodiversity Impact Assessment was undertaken by Simon Todd of 3Foxes Biodiversity Solutions to inform the outcome of this BA from a terrestrial biodiversity perspective. It was undertaken in accordance with Appendix 6 of the NEMA EIA Regulations, 2014, as amended. The complete Terrestrial Biodiversity Impact Assessment is included in Appendix C.1 of this BA report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Terrestrial Biodiversity Assessment as extracted from Todd (2020) (Appendix C.1 of the BA Report).

Important note: *This assessment is conducted according to Appendix 6 of the NEMA EIA Regulations, 2014, as amended. As explained in Section A.11, the assessment was commissioned in September 2018. It was therefore commissioned a substantial period prior to the publishing of the Assessment Protocol for Terrestrial Biodiversity and Species in GN 320 on 20 March 2020. The Terrestrial Biodiversity assessment was also undertaken and commissioned prior to the Species Protocol published in GN 1150 dated 30 October 2020 came into effect (as discussed in Section A.11). Therefore, the Terrestrial Biodiversity Assessment was undertaken in terms of Appendix 6 of the NEMA EIA Regulations, 2014, as amended, and not in accordance with the latest Protocols indicated above. Proof of the date of appointment of the Terrestrial Biodiversity specialist, Simon Todd of 3Foxes Biodiversity Solutions, is provided in Appendix F.2.*

It is important to note that apart from the Terrestrial Biodiversity Impact Assessment noted above, two additional Biodiversity Offset studies have also been prepared. The biodiversity studies that were undertaken to inform this BA process are indicated below:

- Terrestrial Biodiversity Impact Assessment Report to assess potential impacts (ST)
- An initial Biodiversity Offset Analyis report compiled recommending livestock grazing reduction (ST)

- This proposed recommendation to reduce the livestock grazing on site was not supported by DEFF (2 x pre-appl. meetings)
- SANParks commented and not in agreement either
- The initial Biodiversity Offset Analysis report was updasted (ST), recommending livestock removal for 30 years.
- As livestock removal is not supported by DEFF, the Applicant commissioned an Additional Offset Biodiversity Report (including proposed implementation (Mark Botha) – This study amended / added to the impact ratings and recommended an Offset.

D.2.1.1 Approach and Methodology

The approach and methodology adopted in the Terrestrial Biodiversity Impact Assessment is described in this section.

The Terrestrial Biodiversity Impact Assessment was also conducted according to the best-practice guidelines and principles for biodiversity assessment as outlined by Brownlie (2005) and De Villiers *et al*. (2005).

In terms of NEMA, this assessment demonstrates how the proponent intends to comply with the principles contained in Section 2 of NEMA, which amongst other things, indicates that environmental management should:

- (In order of priority) aim to: avoid, minimise or remedy disturbance of ecosystems and loss of biodiversity (Figure D.3);
- Avoid degradation of the environment;
- Avoid jeopardising ecosystem integrity;
- Pursue the best practicable environmental option by means of integrated environmental management;
- Protect the environment as the people's common heritage;
- Control and minimise environmental damage; and
- Pay specific attention to management and planning procedures pertaining to sensitive, vulnerable, highly dynamic or stressed ecosystems.

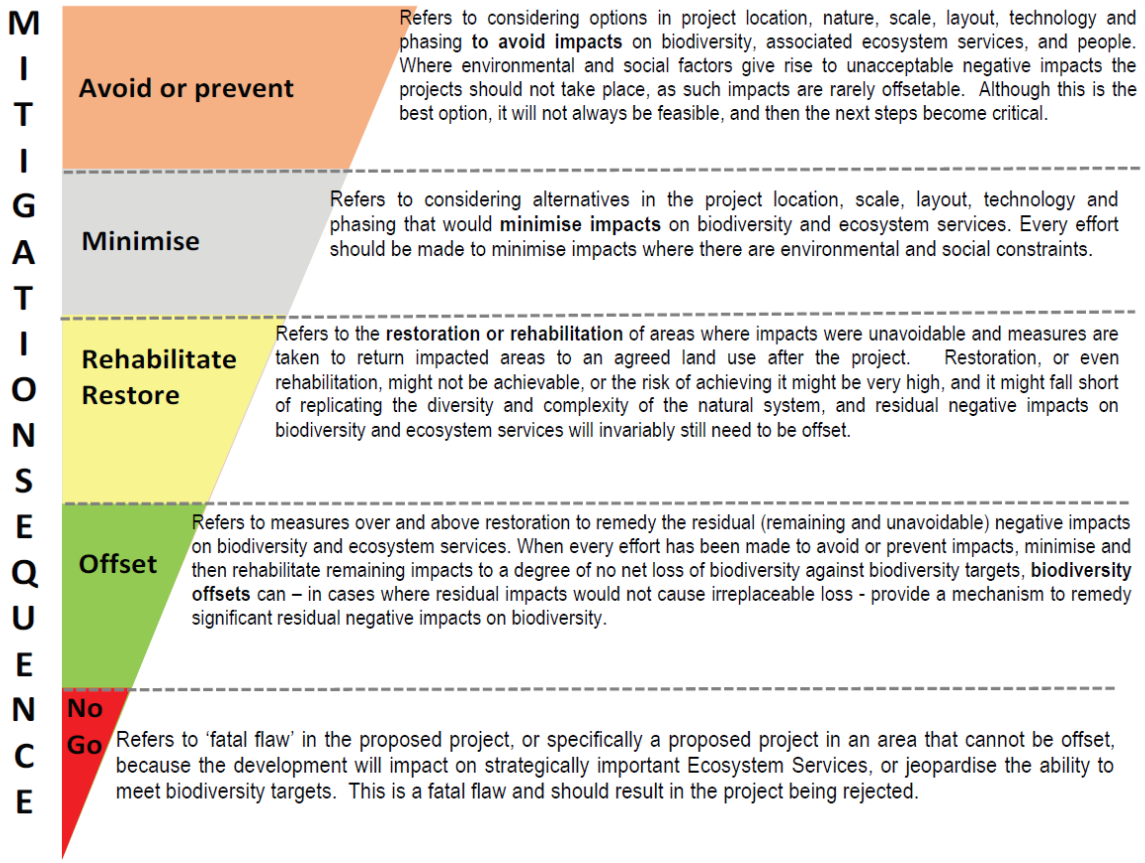


Figure D.3. The mitigation hierarchy that is used to guide the study in terms of the priority of different mitigation and avoidance strategies.

Furthermore, in terms of best practice guidelines as outlined by Brownlie (2005) and De Villiers et al. (2005), a precautionary and risk-averse approach should be adopted for projects which may result in substantial detrimental impacts on biodiversity and ecosystems, especially the irreversible loss of habitat and ecological functioning in threatened ecosystems or designated sensitive areas: i.e. CBAs (as identified by systematic conservation plans, Biodiversity Sector Plans or Bioregional Plans) and Freshwater Ecosystem Priority Areas.

In order to adhere to the above principles and best-practice guidelines, the following approach forms the basis for the study approach and assessment philosophy:

- The study includes data searches, desktop studies, site walkovers / field survey of the properties to be affected by the proposed development and baseline data collection, including:
    - A description of the broad ecological characteristics of the site and its surrounds in terms of any mapped spatial components of ecological processes and/or patchiness, patch size, relative isolation of patches, connectivity, corridors, disturbance regimes, ecotones, buffering, viability, etc.

In terms of **pattern**, the following is identified or described:

Community and ecosystem level

- The main vegetation type, its aerial extent and interaction with neighboring types, soils or topography; and
- Threatened or vulnerable ecosystems (*cf. SA vegetation map/National Spatial Biodiversity Assessment, fine-scale systematic conservation plans, etc.*).

Species level

- SCC (giving location if possible using the Global Positioning System (GPS);
- The viability of an estimated population size of the SCC that are present (including the degree of confidence in prediction based on availability of information and specialist knowledge, i.e. High=70-100% confident, Medium 40-70% confident, low 0-40% confident); and
- The likelihood of other SCC, occurring in the vicinity (include degree of confidence).

Fauna

- Describe and assess the terrestrial fauna present in the area that will be affected by the proposed development;
- Conduct a faunal assessment that can be integrated into the ecological study;
- Describe the existing impacts of current land use as they affect the fauna;
- Clarify SSC and that are known to be:
    - endemic to the region;
    - that are considered to be of conservational concern;
    - that are in commercial trade (CITES listed species); or
    - are of cultural significance.
- Provide monitoring requirements as input into the EMPrs for faunal related issues.

Other pattern issues

- Any significant landscape features or rare or important vegetation associations such as seasonal wetlands, alluvium, seeps, quartz patches or salt marshes in the vicinity;
- The extent of alien plant cover of the site, and whether the infestation is the result of prior soil disturbance such as ploughing or quarrying (alien cover resulting from disturbance is generally more difficult to restore than infestation of undisturbed sites); and
- The condition of the site in terms of current or previous land uses.

In terms of **process**, the following is identified and/or described:

- The key ecological “drivers” of ecosystems on the site and in the vicinity, such as fire;
- Any mapped spatial component of an ecological process that may occur at the site or in its vicinity (i.e. *corridors* such as watercourses, upland-lowland gradients, migration routes, coastal linkages or inland-trending dunes, and *vegetation boundaries* such as edaphic interfaces, upland-lowland interfaces or biome boundaries);
- Any possible changes in key processes, e.g. increased fire frequency or drainage/artificial recharge of aquatic systems;
- Furthermore, any further studies that may be required during or after the BA process will be outlined;
- All relevant legislation, permits and standards that would apply to the development will be identified; and
- The opportunities and constraints for development will be described and shown graphically on an aerial photograph, satellite image or map delineated at an appropriate level of spatial accuracy.

D.2.1.2 Relevant Project Aspects relating to Terrestrial Biodiversity and Species Impacts

The development of the proposed Komas WEF and associated infrastructure will result in the clearance of vegetation which will cause habit loss and loss of plant SCC and fauna during the construction phase. The operational phase of the proposed Komas WEF will result in impacts on CBAs due to habitat loss and disturbance, increased soil erosion and increased alien plant invasion. It will also cause noise and disturbance to fauna. The decommissioning phase will also result in habitat loss and disturbance which will cause increased soil erosion and increased alien plant invasion.

D.2.1.3 Potential Impacts

The potential direct, indirect and cumulative impacts identified as part of the Terrestrial Biodiversity Impact Assessment are included below:

Construction Phase:

- Impact on vegetation and plant SCC; and
- Direct and indirect faunal impacts.

Impact on vegetation and plant SCC

Although the abundance of plant SCC at the site is low, some individuals of such species are highly likely to be impacted by the development. However, the density of SCC is low and there are no species of very high concern which would be particularly badly affected by the development. Aside from the impact on SCC, there would be a more general loss of intact vegetation within the development footprint. This impact would be generated by turbine foundations, turbine hard-stands as well as access roads and the on-site SS and lay-down areas. Additional avoidance of impact on plant SCC could be achieved through a preconstruction walk-through of the facility before construction to micro-site the roads and turbine positions where necessary.

Direct and indirect faunal impacts

The construction of the development will result in significant habitat loss, noise and disturbance on site. This will lead to direct and indirect disturbance of resident fauna. Some slow-moving or retiring species such as many reptiles would likely not be able to escape the construction machinery and would be killed. There are also several species present at the site which are vulnerable to poaching and there is a risk that these species may be targeted. This impact would be caused by the presence and operation of construction machinery and personnel on the site. This impact would however be transient and restricted to the construction phase, with significantly lower levels of disturbance during the operational phase.

Operational Phase:

- Increased soil erosion;
- Increased Alien Plant Invasion;
- Operational impacts on fauna; and
- Impacts on CBAs.

Increased soil erosion

The site has sandy soils that are vulnerable to erosion, especially in the face of the strong winds that the area experiences. Once mobilised, the sands can be very difficult to arrest as the moving sand smothers new vegetation as it travels. There are already several areas of mobile dunes at the site that are severely affected by wind erosion.

Increased Alien Plant Invasion

There are already several alien species present on the site such as *Acacia cyclops* and disturbance created during construction would leave the site vulnerable to further alien plant invasion, especially along the access roads and other areas which receive additional run-off from the hardened surfaces of the development.

Operational impacts on fauna

Operational activities as well as the presence of the turbines and the noise they generate may deter some sensitive fauna from the area. In addition, the access roads may function to fragment the habitat for some fauna, which are either unable to or unwilling to traverse open areas. For some species this relates to predation risk as slow-moving species such as tortoises are vulnerable to predation by crows and other predators. In terms of habitat disruption, subterranean species such as Golden Moles and burrowing snakes and skinks are particularly vulnerable to this type of impact as they are unable to traverse the hardened roads or become very exposed to predation when doing so. This is a low-level continuous impact which could have significant cumulative impact on sensitive species.

Impacts on CBAs

A significant proportion of the development is located within an area that is a recognised area of biodiversity significance and has been classified as a Tier 2 CBA. The development will result in direct habitat loss equivalent to about 31-33 ha within the CBA 2 as well as potentially affect broad-scale ecological processes operating in the area. The impact on the CBA 2 would result from the transformation of currently intact habitat as well as the presence and operation of the facility.

Decommissioning Phase:

- Increased soil erosion; and
- Increased alien plant invasion.

Increased soil erosion

As already described, the site has sandy soils that are vulnerable to erosion, especially in the face of the strong winds that the area experiences. Once mobilised, the sands can be very difficult to arrest as the moving sand smothers new vegetation as it travels. Decommissioning will remove the hard infrastructure from the site, generating disturbance and leaving areas that are unvegetated and vulnerable to erosion.

Increased alien plant invasion

There are already several alien species present on the site such as *Acacia cyclops* and disturbance created during decommissioning would leave the site vulnerable to further alien plant invasion.

Cumulative Impacts:

- Cumulative habitat loss and impact on broad-scale ecological processes; and
- Decreased ability to meet conservation targets.

The cumulative assessment considers all nine WEFs and two solar PV facilities that are proposed (which have either received EA or have submitted an application to DEFF) within 50 km of the subject site. This includes the proposed 300 MW Kap Vley project east of the site, the proposed 140 MW Namas WEF west of the site, the proposed 140 MW Zonnequa WEF northwest of the site, the proposed 300 MW Eskom Kleinzee WEF towards the coast and the proposed Project Blue WEF around Kleinsee. Those projects further afield are generally in a different environment and ecological context from the proposed Komas WEF site and as such are of less relevance when considering the cumulative impacts of the Komas development and the surrounding projects. The footprint of these different facilities would be approximately 700ha and the Komas development would add an additional 11% to this, assuming that all these different developments go ahead, which is unlikely. However, this is a simplistic analysis and the real concern would be around the disruption of ecological processes and removal of important biodiversity features from possible future conservation expansion. The long-term potential impact of wind energy development should also be placed in context of other development impacts in the area, especially mining. The extent of habitat loss due to mining in the area around Kleinsee alone is more than 4000 ha and similar extents have been lost further afield both to the north and south of Kleinsee. The total extent of habitat loss from wind energy development would thus be less than 10% of that caused my mining. The primary ecological process that would potentially be affected is likely to be landscape connectivity for fauna. Not all species would be equally affected and species that may be particularly vulnerable to wind farm impacts include golden moles and Bat-eared Foxes, which may be sensitive to the noise turbines generate, while subterannean reptiles may experience fragmentation due to roads and noise. Bat-eared Foxes are however fairly mobile and would easily be able to move through wind farm areas if required. This would however not be the case for golden moles and subterranean reptiles, with the result that these groups can be idenitified as being most vulnerable to cumulative impact in the area. There is however currently no available information or research on this topic and long-term monitoring would be required to identify which species are impacted and the degree of impact. As such, the degree and nature of cumulative impacts on fauna in the area must be considered with a high degree of uncertainty.

Although the concentration of wind energy development in the area is a potential concern, the area is a REDZ, which has the purpose of encouraging renewable energy development within these areas, with the result that high cumulative impacts are to be expected in these areas. In the broader Namaqualand Coastal-Plain context, the concentration of wind energy projects in this restricted area can be viewed as positive as it discourages the development of wind farms in other more important areas. In addition, the total remaining extent of Namaqualand Strandveld is more than 250 000 ha and the loss of less than 0.5% of this area to wind farm development would not constitute significant cumulative loss, especially given that large tracts of this vegetation type are protected within the Namakwa National Park. The contribution of the Komas WEF to cumulative impacts is this seen as being relatively low. Overall, it does not appear that cumulative impacts on fauna and flora resulting from the Komas wind farm development would warrant an offset as these are considered relatively low after mitigation.

The additional Biodiversity Offset Report (including the proposed implementation) (Botha, 2021) notes that assessment of cumulative impacts is notoriously difficult, especially in a landscape where several development applications have been approved, but are not yet constructed, and several of which may never be constructed (for financial, regulatory, commercial or other unrelated reasons). Further, the proposed WEF is located in the REDZ which was designed (through a strategic assessment) to deliberately cluster impacts from renewable energy facilities.

It is further stated that it is very unlikely that the proposed Komas WEF, or indeed the cumulative impact of all the WEFs in this part of the REDZ, will impact on any foundational ecological processes. Either way, the offset design should endeavour to secure spatial representation to cater for persistence of these processes (Botha, 2021).

D.2.1.4 Impact Assessment

The table below includes an assessment of the potential **direct impacts to the Terrestrial Biodiversity (fauna and flora)** identified for the proposed Komas WEF and associated infrastructure for the construction, operation, and decommissioning phases and the cumulative impacts. The full assessment is provided in the Terrestrial Biodiversity Impact Assessment (Appendix C.1 of the BA Report).

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
CONSTRUCTION PHASE: DIRECT IMPACTS			
Impact on vegetation and plant SCC.	• No development of turbines, roads or other infrastructure within No-Go areas. • Preconstruction walk-through of the development footprint to further refine the layout and reduce impacts on SCC through micro-siting of the turbines and access roads. • Demarcate all areas to be cleared with construction tape or other appropriate and effective means. However, caution should be exercised to avoid using material that might entangle fauna.	**Moderate**	**Low**
Faunal impacts.	• Avoidance of identified areas of high faunal importance at the design stage. • Ensure that laydown areas and other temporary infrastructure is located within medium- or low- sensitivity areas, preferably previously transformed areas if possible. • Search and rescue for reptiles and other vulnerable species to be undertaken during construction, before areas are cleared. • During construction any fauna directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person. • Limit access to the site and ensure that construction staff and machinery	**Moderate**	**Low**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
	remain within the demarcated construction areas. • Environmental induction to be conducted for all staff and contractors on-site. • All construction vehicles should adhere to a low speed limit (40 km/h for cars and 30 km/h for trucks) to avoid collisions with susceptible species such as snakes and tortoises and rabbits or hares. Speed limits should apply within the construction area as well as on the public gravel access roads to the site. • If any parts of site such as construction camps must be lit at night, this should be done with low-UV type lights (such as most LEDs) as far as practically possible, which do not attract insects and which should be directed downwards.		
Impact on CBAs	• Minimise the development footprint as far as possible, which includes locating temporary-use areas such as construction camps and lay-down areas in previously disturbed areas.	**Moderate**	**Low**[8]
OPERATIONAL PHASE: DIRECT IMPACTS			
Increased soil erosion.	• Erosion management at the site should take place according to the Erosion Management Plan and Rehabilitation Plan (see EMPrs in Appendix G). • All roads and other hardened surfaces should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk. • Regular monitoring for erosion to be undertaken after construction to	**Moderate**	**Low**

[8] Please note there is a discrepancy in the assessment rating provided in the additional Biodiversity Offset Report (Botha 2021). In this report, the significance is assessed to moderate before and after mitigation, prior to the implementation of an offset. Botha (2021) notes that with the implementation of an offset, the significance is low.

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
	ensure that no erosion problems have developed as result of the disturbance, as per the Erosion Management and Rehabilitation Plans for the project. • All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. • All cleared areas should be revegetated with indigenous perennial species from the local area. • Avoid areas of high wind erosion vulnerability as much as possible. • Use net barriers, geotextiles, active rehabilitation and other measures during and after construction to minimise sand movement at the site.		
Increased alien plant invasion.	• Alien management plan to be implemented during the operational phase of the development, which makes provision for regular alien clearing and monitoring. • Wherever excavation is necessary, topsoil should be set aside and replaced after construction to encourage natural regeneration of the local indigenous species. • Due to the disturbance at the site as well as the increased runoff generated by the hard infrastructure, alien plant species are likely to be a long-term problem at the site and a long-term control plan will need to be implemented. Problem woody species such as *Acacia cyclops* are already present in the area and are likely to increase rapidly if not controlled. • Regular monitoring for alien plants within the development footprint as well as adjacent areas which receive runoff from the facility as there are also likely to be prone to invasion problems. • Regular alien clearing should be conducted, as needed, using the best-practice methods for the species concerned. The use of herbicides should	**Moderate**	**Low**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
	be avoided as far as possible.		
Impacts on fauna.	• Open space management plan for the development, which makes provision for favourable management of the facility and the surrounding area for fauna. • Limiting access to the site to staff and contractors only. • Appropriate design of roads and other infrastructure where appropriate to minimise faunal impacts and allow fauna to pass through or underneath these features. • No electrical fencing within 20 cm of the ground as tortoises become stuck against such fences and are electrocuted to death. • If the site must be lit at night for security purposes, this should be done with downward-directed low-UV type lights (such as most LEDs) as far as possible, which do not attract insects. • All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. • All vehicles accessing the site should adhere to a low speed limit (40km/h max) to avoid collisions with susceptible species such as snakes and tortoises.	**Moderate**	**Low**
Impacts on CBAs.	• Avoid impact to restricted and specialised habitats such as pans or active dune fields. • Implement a management plan for the site which takes cognisance of the ecological value of the area and is favourable for the maintenance of	**Moderate**	**Low** [9]

[9] Please note there is a discrepancy in the assessment rating provided in the additional Biodiversity Offset Report (Botha 2021). In this report, the significance is assessed to moderate before and after mitigation, prior to the implementation of an offset. Botha (2021) notes that with the implementation

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
	fauna and flora in the area.		
DECOMMISSIONING PHASE: DIRECT IMPACTS			
Increased soil erosion.	• All hard infrastructure should be removed and the footprint areas rehabilitated with locally-sourced perennial species. • The use of net barriers, geotextiles, active rehabilitation and other measures after decommissioning to minimise sand movement and enhance revegetation at the site. • Monitoring of rehabilitation success at the site for at least three years after decommissioning or until the rehabilitation benchmarks and criteria have been met. • All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques.	**High**	**Low**
Increased alien plant invasion.	• Alien management plan to be implemented during the decommissioning phase of the development, which makes provision for regular alien clearing and monitoring for at least three years after decommissioning. • Active rehabilitation and revegetation of previously disturbed areas with indigenous species selected from the local environment. • Wherever excavation is necessary for decommissioning, topsoil should be set aside and replaced after decommissioning activities are complete to encourage natural regeneration of the local indigenous species. • Due to the disturbance at the site alien plant species are likely to be a long-term problem at the site following decommissioning and regular control will need to be implemented until a cover of indigenous species has returned. • Regular monitoring for alien plants within the disturbed areas for at least three years after decommissioning or until alien invasive are no longer a	**High**	**Low**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
	problem at the site. • Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.		
CUMULATIVE IMPACTS			
Cumulative habitat loss and impact on broad scale ecological processes.	• Minimise the development footprint as far as possible. • The facility should be managed in a biodiversity-conscious manner in accordance with an open-space management plan for the facility. • Ensure that on-site impacts on plant SCC are maintained at acceptable levels through avoidance of significant populations of these species.	**Moderate**	**Low**
Impaired ability to meet conservation targets.	• Engage with the provincial and national conservation authorities on the implications of the current development for future conservation expansion in the area. (Note: An initial Biodiversity offset analysis has been conducted and is included in Appendix J.3(2) of this BA Report). The proposed mitigation measures in this report, i.e to reduce the livestock grazing on site, was not support by DEFF or by the Northern Cape Department of Conservation. Therefore, an additional Biodiversity Offset Report (including proposed implementation) was prepared by Mr. Mark Botha (2021). In addition, comment on the Terrestrial Biodiversity Impact Assessment and the initial Biodiversity Offset Analysis, including the recommendations held there-in, has been received from the provincial commenting authorities. • Develop an ecological offset study to evaluate the potential need for an offset to mitigate the impacts of the development on CBAs and the NC-PAES Focus Areas. (Note: An initial Biodiversity Offset Analysis has been completed and is included in Appendix J.3(2) of this BA Report. An additional Biodiversity Offset Report (including proposed implementation)	**Moderate**	**Low**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
	was also prepared by Mr Mark Botha and is included in Appendix J.3(1).		

Impact significance included in the Biodiversity Offset Implementation Report

Below is the impact assessment provided by Mr. Mark Botha in his additional Biodiversity Offset Implementation Report (including proposed implementation) (Appendix J.3(1) of this BA Report) which comprises an amended table of impact significance ratings to clarify the requirement for a biodiversity offset. This includes highly summarised impact ratings for Birds and Bats.

Todd (2020a) sets out his rationale for impact significance ratings in section 1.7 on p 39 of the Biodiversity Impact Assessment Report (Appendix C.1 of this BA Report).

Of importance here is that whether the final rating is 'moderate' or 'high' is not really material from an offset perspective as either would trigger an offset requirement. What follows is an elaboration of Todd's impact significance ratings to tease out some of the specific administrative and biodiversity planning features and their likely impact ratings.

Even after mitigation, several negative impacts are still assessed as Moderate. Therefore, it would appear that an offset is required to mitigate the impacts on the ability to meet conservation targets, to contribute to the expansion of Protected Areas and to ensure that the features driving the designation as CBA2 are effectively protected.

It is however noted that the CBA and PAE Focus Areas in this specific region are notional, and algorithm determined hexagons. Only once these are adequately downscaled in an appropriate regional plan can the specific Komas impacts be adequately contextualised and rated as local, regional or national. There are many options in the landscape to achieve the national targets (Botha, 2021).

It is very unlikely that the Komas WEF, or indeed the cumulative impact of all the WEFs in this part of the REDZ, will impact on any foundational ecological processes. However, the proposed biodiversity offset will be implemented in an attempt to counterbalance the impacts on all affected biodiversity components at the proposed Komas WEF site. Details on the proposed biodiversity offset are included in Sections D.2.1.7 and D.2.1.8 below.

Phase/Impact	Before Mitigation	After Mitigation but prior to offset	Considerations
Construction Phase			
Impact on plant SCC	Moderate	Low	
Impact on Fauna	Moderate	Low	
Operational Phase			
Increased Soil Erosion	Moderate	Low	
Increased Alien Plant Invasion	Moderate	Low	
Terrestrial Faunal Impact	Moderate	Low	
Avifauna Impact (Simmons & Martins 2021; Dippenaar 2021)	Moderate - High	Moderate	Mitigation dependent. Acknowledged to be likely over-estimate
CBA2	Moderate	Moderate	Low if offset included
National & NC-PAES Focus Area	Moderate	Moderate	Low if offset included
SANParks' Expansion footprint, buffer zone	Moderate	Moderate	Low if offset included
Decommissioning Phase			
Increased Soil Erosion	High	Low	
Increased Alien Plant Invasion	High	Low	
Cumulative Impacts			
Broad-Scale Ecological Processes	Moderate	Low	
Ability to Meet Conservation Targets	Low	Low	Low if offset included
Reduction of Offset Receiving Area	Low	Low	Very low. Receiving area only likely next to NNP; REDZ and electricity infrastructure more important.

D.2.1.5 Comparative assessment of alternatives

Two alternatives were provided by the Project Applicant for assessment of the BESS and on-site SS complex area (Option 1 and Option 2). There is not a strong preference between these alternatives from a Terrestrial Biodiversity perspective, but Option 2 is favoured as it closer to the proposed Collector SS (which will be assessed as part of a separate BA process) (See Figure A.1). However, Option 1 is also feasible and is therefore acceptable from a Terrestrial Biodiversity impact perspective.

D.2.1.6 Assessment of No-Go alternative

The No-Go alternative would result in the development not going ahead and the current land-use of extensive livestock grazing continuing at the site. Although extensive livestock grazing can be compatible with biodiversity maintenance, it can also result in a decline in plant and animal species richness if grazing pressure is too high. In the long-term the No-Go alternative would result in the maintenance of the status quo, which can be considered to represent a low negative impact on biodiversity.

D.2.1.7 The need to implement a Biodiversity offset

The Biodiversity Impact Assessment concluded that a biodiversity offset is not considered necessary for development of the site and the on-site mitigation and avoidance measures are considered sufficient to reduce the impacts of the development on the CBA and NC-PAES Focus Area to an acceptable level (Todd, 2021a). However, these on-site mitigation and avoidance measures (i.e. the reduction or removal of livestock grazing on the proposed Komas WEF site) were not deemed acceptable to DEFF and SANParks following the pre-application meetings. DEFF commented that they cannot enforce conditions in the EA on third parties, therefore this condition to reduce the livestock grazing cannot be included in the EA. Therefore, based on these objections and following official comments received from SANParks dated 15 February 2021 (see Appendix D of the BA Report) the Project Applicant commissioned an additional Biodiversity Offset Report (including proposed implementation) which was undertaken by Mr. Mark Botha of *Conservation Strategy, Tactics and Insight* (dated February 2021). This study is included in Appendix J.3(1) of this BA Report (together with the initial Biodiversity Offset Analysis which was undertaken by Mr. Simon Todd (Appendix J.3(2)). It should be noted that the recommendations of the additional Biodiversity Offset Report (including implementation) replace those in the initial Biodiversity Offset Analysis which was undertaken prior to the comments raised by DEFF and SANParks during the pre-application phase.

Therefore, based on the objections from DEFF and SANParks as indicated above, the additional Biodiversity Offset report (including proposed implemention) concluded that an offset is required and should be implemented. The additional Biodiversity Offset study (Botha, 2021) recommends that the implementation of a Biodiversity Offset is appropriate as the **residual impact is negative and of moderate significance**. This is based on the Draft Biodiversity Offset Policy (DEA, 2017). An offset of 810 ha, in Namaqualand Strandveld or an adjacent, related vegetation type in the PAES Focus Area is prudent (Botha, 2021). In the Northern Cape, with several options for meeting targets, it is argued that this mitigation is possible through an offset that secures the features and values for which the CBA is designated.

D.2.1.8 The determinitation of an appropriate biodiversity offset

The proposed Biodiversity Offset was determined based on guidance from the Draft National Biodiversity Offset Guideline Policy (DEA 2017) and based on a risk averse and precautionary approach that was followed.

The additional Biodiversity Offset Report (including proposed implementation) proposes a ratio of 20:1 which considers the impacts of the proposed Komas WEF on the CBA2 and the NNP Expansion Footprint. Impacts on Ecological Support Areas (ESA - often a buffer to CBAs) attract a ratio of 5:1 (DEA 2017). While there is an argument that maximum ratios should not apply in designated development zones (such as REDZs), it is prudent to suggest a 20:1 ratio in line with the Draft Policy indicated above (DEA 2017) as the impact on the applicant is not unacceptably prejudicial (Botha, 2021).

Please refer to the table below taken from the additional Biodiversity Offset Report (Botha (2021)) for the direct footprint impacts from the proposed Komas WEF on various biodiversity features, applicable offset ratios and final offset requirement:

Table: Direct footprint impacts from Komas on various biodiversity features, applicable offset ratios, and final offset requirement

Feature impacted by Komas	*Area (ha)*	*add 5%*	*Total (ha)*	*Ratio*	*Offset (ha)*
Namaqualand Strandveld	79	4	83		
- of which NNP Expansion Footprint	30	2	32	1:20	
- CBA2 (overlaps entirely with above)	31	2	33	1:20	660
- ESA	28	2	30	1:5	150
Total area of offset					**810**

Hence, an Offset of 810 ha of Namaqualand Strandveld, within at least CBA2, preferably CBA1, and within the NNP Expansion Footprint is required. Other features of the offset (habitat composition, ecosystem functionality or ecological process considerations) do not appear to require any adjustment of the impact metrics or ratios.

Biodiversity Offset Options

The Biodiversity Offset Report (Botha, 2021; PP 11-13) sets out how the Mitigation Hierarchy was implemented prior to pursuing an offset as a viable form of mitigation.

The minimum requirements to design an appropriate offset are addressed in the Biodiversity Offset Report. It includes a checklist of required features for the Komas WEF that should be satisfied by the proposed biodiversity offset:

- sufficient area (810 ha) of Namaqualand Strandveld, in reasonable to good condition (or alternatively a mix of different related vegetation types of greater conservation concern than Namaqualand Strandveld);
- sufficient area to secure, or at least contribute significantly to ecological connectivity in this landscape, and climate change gradients (altitudinal, as well as edaphic boundaries);
- be currently designated at least as CBA2 (and/or ideally in CBA1);
- be in the Namaqua National Park Expansion Footprint;

- if unable to secure the impacted vegetation type, it may be possible to "trade-up" for a more threatened, range restricted or species-rich related vegetation type that still meets the other criteria above (Botha 2018).

The said Report lists four options which meet the above-mentioned criteria which can be pursued for the Komas Biodiversity Offset. These include the following:

1. ***Gromis Set-aside*.**

   An area on the southern portion of the farm Platvley 314 (Portion 1) (the 'Gromis' property co-incidentally owned by an owner of the proposed Komas WEF site) has been identified for biodiversity protection (and supported by the terrestrial ecology, bird and bat specialists). This area includes the most conservation-worthy and sensitive habitats on the properties assessed, and is designated as largely CBA1. It could easily be secured through a Lease agreement or purchase, and declared as a Procted Area. If SANParks is unwilling to take on the inclusion into and management of this set-aside as part of the NNP at this stage, it is entirely feasible for it to be managed independently until SANParks is able to incorporate it.

2. *P**urchase offset rights to Roodekol Farm 336 (Portion 5) and an additional property**.*

   The applicant could conclude a purchase agreement with the World Wildlife Fund (WWF) for the rights to Roodekol Farm (Portion 5) as an offset, and an agreement for another property to make up the balance of the required area (another 430 ha would be required). This option would require an agreement between the applicant and WWF, containing a clause that WWF must use the funds from selling the right over Roodekol (Portion 5) to secure further properties in the NNP Expansion Zone, preferably in Namaqualand Strandveld. (This mode of implementation has precedence with the adjacent Kap Vley WEF and is expeditious in the Draft BAR and REIPPP with its inherent uncertainties). WWF has indicated willingness to explore this option (Jan Coetzee WWF-SA pers comm February 2021).

3. ***Secure rights to use sufficient alternative properties** in the list as PAs.* These could be declared and managed independently until such time as SANParks is able to consolidate them into the NNP.

4. ***Purchase or secure farms on open market in the Park Expansion Footprint*** and CBA2 areas, declare sufficient area as a Protected Area, manage them independently until such time as SANParks incorporates this portion of the Park Expansion Footprint into the NNP. At least 9 548 ha of land that meets the offset requirements has recently been offered to conservation for acquisition.

It appears that the best place to locate the offset is on the Gromis site (Farm Platvley 314, Portion 1), This option is preferred by the Project Applicant and is also supported by the property landlowner. The proposed Gromis set aside comprises an area of approximately 1 141 ha which consists of 202 ha and 939 ha of CBA1 and CBA2 respectively. The area of the set aside on the Gromis site proposed for the offset is supported by both the Avifauna and Bat specialists. Although the proposed Gromis set aside meets all the requirements to address the impacts associated with the Komas WEF, it is noted that SANParks' preference may differ from the applicant's, but cannot dictate which specific offset is required, only those which it is prepared to take short term management responsibility for.

D.2.1.9 Concluding statement Biodiversity Offset Implementation study (Mr. Mark Botha)

The Biodiversity Offset Implementation study concluded that although the proposed Komas WEF impacts marginally on the NNP Expansion Footprint, and thus the PAES ocus area, and thus a CBA2 in terms of the applicable provincial plan, these impacts are not deemed sufficiently high to suggest that the development should not proceed. The impacts on intrinsic biodiversity features appear manageable. As the project is located in a REDZ and there are several offset options in the immediate vicinity, all with high likelihood of success, the specialist notes that he has no objections to the proposed Komas WEF development proceeding.

D.2.2 Aquatic Biodiversity

The Aquatic Biodiversity Assessment was undertaken by Joshua Gericke and Louise Zdanow from Enviroswift (Pty) Ltd to inform the outcome of this BA from an aquatic biodiversity perspective. An Aquatic Biodiversity Compliance Statement was undertaken in terms of the requirements of the Aquatic Biodiversity Protocol as per Government Notice 320 published on 20 March 2020 in GG No. 43110. The complete Aquatic Biodiversity Compliance Statement is included in Appendix C.2 of this report. The following section provides a summary of the Approach, Key Findings and Concluding Statement undertaken for the Aquatic Biodiversity Compliance Statement. The information below is extracted from Enviroswift (2020) (Appendix C.2 of the BA Report).

Note: An Aquatic Biodiversity Compliance Statement is not required to formally rate aquatic impacts. It is only required to indicate whether or not the proposed development will have an unacceptable impact on the aquatic resources of the site (if any). It must provide a substantiated statement on the acceptability, or not, of the proposed development and a recommendation on the approval, or not of the proposed development. Therefore, an assessment of impacts was not provided in this section.

D.2.2.1 Approach and Methodology

Available national and provincial databases were utilised in order to confirm the presence or absence of watercourses within the study area and to determine the high level conservation significance of the study area. Primary resources which were utilised are listed within Section 1.1.6 of the Compliance Statement included in Appendix C.2 of the BA Report.

The desktop assessment was followed by a physical site survey undertaken on the 29th of January 2020 in order to groundtruth the accuracy of the desktop information, as well as to verify the perceived level of sensitivity of the study area.

All results including supplementary maps produced with the use of Quantum Geographic Information System (QGIS) as well as the site sensitivity are included within the report. As indicated above, the report was prepared in accordance with the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Aquatic Biodiversity (Government Notice 320, dated 20 March 2020), as well as in line with the NWA.

D.2.2.2 Verification of Aquatic Biodiversity sensitivity as identified by the Screening Tool

As described in Section B of this BA Report, according to the National Wetland Map 5 (CSIR, 2018), a large depression wetland is located within the western portion of the study area (Figure B.23). This depression has been indicated as an area of very high sensitivity in terms of Aquatic Biodiversity by the

National Environmental Screening Tool (Figure B.24). However, upon investigation of this area during the field survey undertaken in January 2020 it was found that the area indicated as wetland habitat is in fact an extensive dune field. This dune field is a flat area located between two ridge lines and is characterised by fresh, wind-blown sand and dry terrestrial vegetation (Figure B.25). There is no indication that water accumulates within this area, and no wetland indicators as defined by the delineation guidelines (DWAF 2005, updated 2008) were encountered e.g. hydromorphic soils, wetland vegetation, signs of salt accumulation or hardened / cracked surface layers. Therefore, the site sensitivity verification disputes the rating of very high sensitivity assigned to this area in the National Web-Based Screening Tool in terms of Aquatic Biodiversity.

D.2.2.3 Results of the Field Study

The low regional rainfall, semi-desert conditions and dominance of well drained, sandy soils within the study area is not conducive to the formation of wetland habitat. Furthermore, the relatively flat topography, the absence of ridges, and the lack of concentrated flow paths is not conducive to the formation of drainage lines. **No watercourses as defined by the NWA were therefore encountered within the study area, and no additional watercourses have been indicated within 500 m of the study area by desktop resources.**

D.2.2.4 Comparative assessment of alternatives

The Project Applicant provided two alternatives for assessment for the BESS and on-site SS complex area (Option 1 and Option 2). Both alternatives are acceptable from an aquatic perspective as there are no watercourses on the proposed Komas WEF site.

D.2.2.5 Concluding Statement

No watercourses were encountered within the study area. It is therefore the opinion of the specialist that the study area is not considered to be important in terms of Aquatic Biodiversity and would fall within the low sensitivity category as defined by the National Web-Based Environmental Screening Tool. The proposed development will not have an impact on any aquatic features and a full Aquatic Biodiversity Specialist Assessment is therefore not required. A Compliance Statement has been prepared instead of a full specialist assessment in accordance with the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Aquatic Biodiversity (Government Gazette 43110/ Government Notice 320, dated 20 March 2020). It is the opinion of the Aquatic Biodiversity specialist that this Compliance Statement is sufficient as the aquatic sensitivity of the site was rated as very low and therefore the rating of very high significance as identified by the National Web-Based Environmental Screening Tool is disputed based on the evidence collected during the site visit and as motivated in this report.

It is the opinion of the specialist that the proposed development of the Komas WEF and associated infrastructure does not pose an unacceptable risk and can therefore be approved from an Aquatic Biodiversity perspective.

D.2.3 Avifauna Impact Assessment

The Avifauna Impact Assessment was undertaken by Dr. Rob Simmons of Birds and Bats Unlimited to inform the outcome of this BA from an Avifaunal perspective. The Avifauna Impact Assessment is undertaken in accordance with Appendix 6 of the NEMA EIA Regulations, 2014, as amended. The complete Avifauna Impact Assessment is included in Appendix C.3 of this report. The following

section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Avifauna Impact Assessment. The information below is extracted from Simmons (2020) (Appendix C.3 of the BA Report).

Important Note: *The Avifauna Impact Assessment (Appendix C.3) was commissioned in February 2019. It was therefore commissioned a substantial period prior to the Assessment Protocol for Avifauna Specialist Assessment published in GN 320 on 20 March 2020 came into effect. Therefore, the Avifauna Assessment was undertaken in terms of Appendix 6 of the NEMA EIA Regulations, 2014, as amended. Proof of the date of appointment of the avifauna specialist, Dr. Rob Simmons of Birds and Bats Unlimited, is provided in Appendix F.2.*

D.2.3.1 Approach and Methodology

The avian pre-construction monitoring reported here covered 12-months in accordance with the requirements of the Best Practice Guidelines for assessing and monitoring the impacts of wind energy facilities in southern Africa, produced by BirdLife South Africa and the Endangered Wildlife Trust (Jenkins et al. 2015).

Priority species, defined as the top 100 collision-prone species (CPS) and red-listed species that passed through the 27-km^2 area, were documented in autumn (March 2019), winter (July 2019), spring (October 2019) and summer (December 2019), to help quantify, assess, predict and reduce potential negative impacts to birds associated with the proposed Komas WEF. This covers all the bird-active months for migrant and resident bird species.

The following is reported on:

i. the species-richness of smaller resident bird species at the proposed Komas WEF site by season;
ii. the presence and passage rates of all larger priority avifauna species passing through the proposed WEF site (and the Control area) from Vantage Point (VP) surveys; and
iii. breeding species throughout the area.

The study concludes by identifying the potential impacts and the high- and medium-risk sensitivity areas within the proposed Komas WEF site, based on the presence and number of priority species using the area. The potential cumulative impacts were also identified and assessed as per Appendix 6 of the NEMA EIA Regulations, 2014, as amended.

Transects: All bird transects took place in the morning (bird-active) hours. Each 1-km transect was walked slowly over a 25- to 40-minute duration, depending on terrain and number of birds present. All species were identified where possible, and the number of individual birds and the perpendicular distance to them recorded with a Leica laser rangemaster 1600. This allows an estimate of the density (birds per unit area and kilometre) and the species richness in each area. All large birds (mainly raptors and bustards) were simultaneously recorded, and the position of any large active nests found in the study area were also noted and recorded.

Vantage Point (VP) monitoring is the most important aspect of such site surveys (Jenkins et al. 2015)). Each VP requires 12 hours' observations over two separate days to record passage rates of Priority Collision-Prone Species. That is, recording the number of priority species (e.g. large raptors and korhaans/bustards) passing, per hour, through the proposed Komas WEF site from equally spaced VPs in the WEF and Control areas. These were undertaken from hills and other raised points

allowing uninterrupted views of about 1.5 km. Because Vulnerable Red Data Verreaux's Eagles were recorded in VP observations in July 2019, the observation hours were increased to 18 hours per site visit, (i.e. 6 hours per day for three days) based on recommendations in the Verreaux's Eagle Guidelines (Ralston-Paton, 2017).

At a distance of 1.5 km, it becomes more difficult to identify each species and their positions, but the presence and identity of larger birds is still possible over these distances with 8.5x or 10x Swarovski binoculars. The VPs were sited to cover the entire study area equally. The flight height and behaviour of identified birds was estimated every 15 seconds and recorded directly onto laminated Google Earth maps in the field, and then transferred to a digital Google Earth image of the area.

Flight height is a difficult parameter to measure but a Laser Rangemaster was used, and the presence of a 120 m wind mast on site and farmers' windmills were used to aid overall accuracy. In a test of the bird specialists' accuracy in estimating flight heights using a drone with a built-in GPS, the average error was found to be 9 m and the median error 11 m (Francisco Cervantes Peralta, Centre for Statistics and Ecology, UCT, pers. comm.).

D.2.3.2 Relevant Project Aspects relating to Avifaunal Impacts

Components of the proposed project that are relevant in terms of avifauna are listed below:

- A maximum of 50 WTGs with a maximum Hub Height and Rotor Diameter of 200 m each;
- Building Infrastructure including offices; O&M control centre; warehouse/workshop; ablution facility; converter/inverter stations; on-site SS and/or a switching SS; and guard houses; associated infrastructure;
- Internal 33 kV power lines;
- Fencing around the WEF infrastructure; and
- Construction work area (i.e. laydown area).

D.2.3.3 Potential Impacts

The potential impacts identified during the Avifauna Impact Assessment include:

Construction Phase:

- Disturbance and loss of foraging habitat around the WEF site for the Red-listed bird groups due to the construction of the WEF and associated infrastructure.

While the final footprint of most WEFs is likely to be relatively small, the construction phase of development incurs quite extensive temporary or permanent destruction of habitat. This may be of lasting significance where WEF sites coincide with critical areas for restricted range, endemic and/or threatened species. Similarly, construction, and maintenance activities are likely to cause some disturbance to birds in the general surrounds, and especially of shy and/or ground-nesting species resident in the area.

Mitigation of such effects requires that Best-Practice principles be rigorously applied – that sites are selected to avoid the destruction of key habitats, and construction and final footprints, as well as sources of disturbance of key species, must be minimised.

Some studies have shown significant decreases in the numbers of birds in areas where WEFs occur, as a result of avoidance due to noise or movement of the turbines (e.g. Larsen & Guillemette, 2007). Others have shown decreases attributed to a combination of collision casualties and avoidance, or exclusion from the impact zone of the facility (Stewart et al. 2007).

Such displacement effects are probably more relevant in situations where WEFs are built in natural habitat (Pearce-Higgins et al. 2009, Madders & Whitfield 2006) than in modified environments such as farmland (Devereaux et al. 2008).

Operational Phase:

- Fatalities caused by collisions with the wind turbines;
- Disturbance and loss of foraging habitat around the WEF site for the Red-listed bird groups due to the operation of the WEF and associated infrastructure;
- Entrapment in perimeter fences; and
- Electrocutions due to collision with associated infrastructure, e.g. internal 33 kV power lines.

The 12-month pre-construction bird monitoring concluded that the Verreaux's Eagle, Jackal Buzzard and Black-chested Snake Eagle recorded on the proposed Komas WEF site are the raptors species most likely to be impacted because of their high likelihood of occurrence and high proportion of flights at BSA.

Multiple factors influence the number of birds killed at any WEF. These can be classified into three broad groupings:

- avian variables (some birds, especially raptors are more prone to collision than others);
- location variables (wind farms placed on migration routes, in pristine vegetation or near roosts or nests will attract more fatalities than others); and
- facility-related variables (farms with more turbines, more lighting, or lattice towers may attract more fatalities).

Two studies have shown a direct relationship between the abundance of birds in an area and the number of collisions (Everaert 2003, Smallwood et al. 2009), and it is logical to assume that the more birds flying through an array of turbines, the higher the chances of a collision occurring. However, this is not found in all studies: De Lucas et al. (2008), found instead a closer relationship with individual species abundance (vultures) and fatalities, but no relationship for all birds. In South Africa, the specialist found that raptor abundance and fatalities were significantly related at an Eastern Cape WEF.

Larger WEFs, with more than 100 turbines, are almost, by definition, more likely to incur increased bird casualties (Kingsley & Whittam 2005), and turbine size may be proportional to collision risk – with taller turbines associated with higher mortality rates in most instances (e.g. de Lucas et al. 2009, Loss et al. 2013, Thaxter et al. 2007).

With newer technology, fewer, larger turbines are needed to generate the same amount of power, which may result in fewer collisions per MW produced (Erickson et al. 1999, Thaxgter et al. 2007). Certain tower structures, and particularly the old-fashioned lattice designs, present many potential perches for birds, increasing the likelihood of collisions as birds land or leave these sites. This problem has, largely, been solved with more modern, tubular tower designs (Drewitt & Langston 2006, 2008).

However, Loss et al. (2013) undertook a meta-analysis of all wind farms and associated fatalities in the USA and found a strong correlation of increasing hub height or blade length with increased impacts to birds. Thus, taller turbines appear to be riskier for birds. The specialist has added to that dataset with eight studies from South Africa and found that the relationship still holds.

Decommissioning Phase

- Disturbance and loss of foraging habitat around the WEF site for the Red-listed bird groups due to the decommissioning of the WEF and associated infrastructure.

Cumulative Impacts:

- Fatalities caused by collisions with the wind turbines;
- Disturbance and loss of foraging habitat around the WEF site for the Red-listed bird groups due to the construction, operation and decommissioning of the WEF and associated infrastructure;
- Entrapment in perimeter fences; and
- Electrocutions due to collision with associated infrastructure, e.g. internal 33 kV power lines.

The cumulative impacts of nine other proposed WEFs within 50 km of the proposed Komas WEF were assessed, and a minimum of 2 334 bird fatalities are estimated annually from these proposed facilities. Approximately 168 of these are estimated to be priority Red Data raptors per year.

D.2.3.4 Impact Assessment

The table below includes an assessment of the potential **direct impacts** identified for the proposed Komas WEF and associated infrastructure for the construction, operational and decommissioning phases. An assessment of the potential cumulative impacts is also included. The full assessment is provided in the Avifauna Impact Assessment (Appendix C.3 of the BA Report).

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
CONSTRUCTION PHASE: DIRECT IMPACTS			
Direct disturbance and loss of foraging habitat around the proposed Komas WEF site for the priority bird groups identified on site (Verreaux's Eagle, Jackal Buzzard Ludwig Bustard, Booted Eagle and Black-chested Snake Eagle).	• If an active nest of Verreaux's Eagle is found a buffer of 3.2 km would be required during the breeding season. • Dust suppression techniques must be implemented on all access roads. • Implement construction-phase monitoring to monitor the effect of the construction itself on priority birds.	**Moderate**	**Moderate**
OPERATIONAL PHASE: DIRECT IMPACTS			
Fatalities caused by avifauna colliding with wind turbines, disturbance and loss of foraging habitat around the proposed Komas WEF site for the Red-listed and priority bird groups identified as at risk. Outside the wind farm birds may be electrocuted or hit by the internal 33 kV overhead power lines, or with double fences, may be entrapped between them.	• If turbines are positioned within the medium-risk areas and they are found to result in mortalities of any Red Data birds then either the turbines must be erected with an automatic shut-down on demand system (DT-bird or similar) or a single blade should be painted black (or with signal red paint) for those select turbines to reduce impacts for eagles and other raptors (May et al. 2020). For turbines outside the medium-risk area (as presently likely) these mitigations are not necessary unless > 1 red data bird is found to be killed per year during the post-construction surveys. • 12-24 months post construction monitoring to be undertaken to assess the mortality of birds in the Komas WEF area, through systematic and direct observation and carcass searches.	**Moderate-High**	**Moderate**
DECOMMISSIONING PHASE: DIRECT IMPACTS			
Direct disturbance and loss of foraging habitat around the proposed Komas WEF site for the Red-listed bird groups	• Reduce degree of disturbance and length of disturbance to a minimum during sensitive breeding seasons, but only if breeding red data species are found within 3-5 km radius from the proposed Komas WEF site.	**Moderate-High**	**Moderate**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
identified as at risk (as noted above).	• Habitat can be rehabilitated to its former attractiveness (from a prey point of view) for the raptors. • The developer to implement decommissioning phase monitoring to assess the effects of rehabilitating the WEF, through direct observation.		
CUMULATIVE IMPACT (Construction, Operational and Decommissioning Phases)			
Fatalities caused by collisions with the wind turbines, entrapment in the perimeter fences, collision with the internal 33 kV power lines or electrocution. Disturbance and loss of foraging habitat around the WEF site for the Red-listed bird groups due to the construction, operation and decommissioning of the WEF and associated infrastructure.	• Although not enforceable on the applicant, all wind farms that are killing red data raptors (at > 1 red data individual per year) should be required to implement shut down on demand or black (red) blade mitigation.	**Moderate-High**	**Moderate**

D.2.3.5 Comparative Assessment of Alternatives

The Project Applicant provided two BESS and on-site SS complex site alternatives to be assessed (i.e. Option 1 and Option 2). Option 2 is the preferred avian option since it is (i) closer to the incoming power line and (ii) there are slightly fewer priority bird flights in this area than at Option 1. Option 1 is not fatally flawed and can be implemented and is therefore acceptable from an avifauna impact perspective.

D.2.3.6 Assessment of No-Go Alternative

The No-Go alternative will result in no additional impacts on avifauna (especially on the Priority bird species) and will result in the ecological status quo being maintained, which will be advantageous to the avifauna. Should the proposed Komas WEF (and other renewable energy projects) not be developed, South Africa will continue its dependence on fossil-fuel based energy instead of turning to green energy. This in turn will not present opportunities for the energy mix to be diversified and to reduce greenhouse gas emissions and associated climate change. Opportunities for renewable energy will be a hugely positive move for South Africa.

D.2.3.7 Concluding Statement

The expected impacts of the proposed Komas WEF and associated infrastructure were overall rated to be Negative and of Moderate significance pre- and post-mitigation**. It is therefore recommended that the proposed Komas WEF be authorised, on condition that the proposed mitigation measures as detailed above, in the Avifauna Impact Assessment (Appendix C.3) and in the EMPr (Appendix G of this BA Report) are strictly implemented.**

D.2.4 Bat Impact Assessment

The Bat Impact Assessment was undertaken by Stephanie Dippenaar of Stephanie Dippenaar Consulting to inform the outcome of this BA from a bat perspective. The Bat Impact Assessment was undertaken in accordance with Appendix 6 of the NEMA EIA Regulations, 2014, as amended. The complete Bat Impact Assessment is included in Appendix C.4 of this report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Bat Impact Assessment. The information below is extracted from Dippenaar (2020) (Appendix C.4 of the BA Report).

D.2.4.1 Approach and Methodology

Acoustic monitoring of the echolocation calls of bats are used to determine the seasonal and diurnal activity patterns of bats at the proposed Komas WEF site. The *South African Good Practice Guidelines for Surveying Bats in Wind Farm Developments – Pre-Construction* (Sowler, *et al*. 2017), is followed throughout the monitoring process. More recent guidelines have been issued in 2020, but the bat monitoring commenced in 2019, when the 2017 Guidelines were still applicable. The following South African Guidelines are used in conjunction with the pre-construction guidelines:

- South African Bat Fatality Threshold Guidelines for Operational Wind Energy facilities (MacEwan, *et al*. 2018);
- Mitigation Guidance for Bats at Wind Energy facilities in South Africa (Aronson, *et al*. 2018); and

- South African Good Practice Guidelines for operational monitoring for Bats at Wind Energy Facilities (Aronson, *et al*. 2014).

The following approach was followed as per the ToR provided during the proposal phase of the bat monitoring:

- A desktop study was conducted of available literature to establish which species occur in the area. This includes the surrounding area as well as information from other wind developments in the area, where accessible.
- Background was provided regarding ecosystem services and the impact of a loss of bats on the broader environment.
- The local and global conservation status of all identified bat species was determined.
- Reconnaissance site visits were conducted as part of the initial project screening phase which included the installation of bat detecting equipment.
- Four site visits were conducted to the proposed Komas WEF site to conduct active surveys, one per season, and day-time investigations. These covered all the various biotopes occurring on site.
- The monitoring equipment was set up and verified. Data was downloaded throughout the monitoring year and echolocation calls were analysed. In cases of data loss, data was used from nearby monitoring systems for statistical analyses or extrapolated. This is explained as such in the report.
- Interviews were conducted with the landowner(s) regarding possible bat occurrence on the property and the surroundings.
- Inputs were provided to inform the turbine layout.
- Information was gathered from other wind farm developments in the close vicinity of the proposed Komas WEF site to assess the cumulative impact of each WEF.
- Mitigation measures are recommended.

The methods of investigation of bats at the proposed wind farm development are described below.

a. Desktop Investigation of the proposed Komas WEF development area as well as the surrounding environment.
b. Passive Acoustic Monitoring Systems: Four static monitoring systems were deployed at the proposed Komas WEF site, two at the Met mast, one at 110 m and one at 20 m height, and two temporary masts of 10 m high. Passive monitoring data[10] was collected between 10 August 2019 and 23 September 2020, representing the four seasons of the year. Seasonal transects were conducted, but limited bat activity was recorded during transect sessions.
c. Roost surveys.
d. Driven transects.
e. Data download and analysis.

[10] The monitoring systems used consist of four Wildlife Acoustics SM4BAT full spectrum bat detectors that are powered by 12V, 7 Amp-h sealed lead acid batteries replenished by photovoltaic (PV) solar panels, see Table 1. Two SD memory cards, class 10 speed, with a capacity of 64 GB or 128 GB each, were utilized within each detector to ensure substantial memory space with high quality recordings, even under conditions of multiple false environmental triggers.

D.2.4.2 Relevant Project Aspects relating to Bat Impacts

Components of the proposed Komas WEF project which could impact on bats, directly through mortality during the operational phase, and indirectly, through the loss of foraging habitat, are the following:

- Noise of construction activities;
- Clearance of natural vegetation for electrical connections, upgrading of access roads, creating hard standing areas or laydown areas;
- In cases where there will be demolition of existing buildings;
- New buildings, such as the BESS and on-site SS complex;
- It there are excavating areas or in areas where borrow pits are created (if required);
- Operational wind turbines. The turbine hub height and rotor diameter are 200 m each;
- Artificial lighting; and
- Decommissioning activities.

D.2.4.3 Potential Impacts

Bats are long-lived mammals and females often produce only one pup per year, resulting in a life-strategy characterized by slow reproduction (Barclay & Harder, 2003). Because of this, bat populations are sensitive to changes in mortality rates and their populations tend to recover slowly from declines. The potential impacts identified during the Bat Impact Assessment include:

Construction Phase:

- Roost disturbance, destruction and fragmentation due to construction activities;
- Creating new habitat amongst the turbines, such as buildings, excavations, or quarries (if applicable); and
- Disturbance to bats during the construction activities during night-time.

Roost disturbance, destruction and fragmentation due to construction activities

The destruction of active bat roosts and/or features that could serve as potential roosts, such as rock formations situated at the southern area of the site and the removal of the limited number of trees on site. The destruction of derelict holes, such as aardvark holes and any fragmentation of woody habitat which include dense bushes. The removal of limited trees and bushes would have an impact on the clutter and clutter-edge foraging groups.

Creating new habitat amongst the turbines, such as buildings, excavations, or quarries (if relevant)

Creating new habitat amongst the turbines which might attract bats. This include buildings with roofs that could serve as roosting space or open water sources in areas where borrow pits are created (if required); quarries or excavation (where applicable) where water could accumulate.

Operational Phase:

- Mortality due to direct collision or barotrauma of resident bats;

- Mortality due to direct collision or barotrauma of migrating bats;
- Loss of bats of conservation value;
- Attraction of bats to wind turbines;
- Loss of habitat and foraging space; and
- Reduction in the size, genetic diversity, resilience, and persistence of bat populations.

Mortality due to direct collision or barotrauma of resident bats

Fatality through direct collision or barotrauma of resident bats occupying the airspace amongst the turbines. The turning blades of the turbines during operation are the most important aspect of the project that would impact negatively on bats. High flying Molossidae species have predominantly been confirmed at the proposed Komas WEF site.

Mortality due to direct collision or barotrauma of migrating bats

Bat fatality during migration. A limited amount of calls similar to *Miniopterus natalensis* (Natal Long-fingered bat), a migration species, have been recorded.

Loss of bats of conservation value

Loss of bats of conservation value. A limited amount of calls similar to the red data *Miniopterus natalensis* have been recorded, as well as the endemic *Sauromys petrophilus.*

Attraction of bats to wind turbines

Bat mortality due to the attraction of bats to wind turbines (Horn, *et al*. 2008). Bats have been shown to sometimes be attracted to wind turbines out of curiosity or reasons still under investigation.

Reduction in the size, genetic diversity, resilience, and persistence of bat populations

Reduction in the size, genetic diversity, resilience and persistence of bat populations. Bats have low reproductive rates and populations are susceptible to reduction by fatalities other than natural death. Furthermore, smaller bat populations are more susceptible to genetic inbreeding.

Decommissioning Phase:

- Disturbance due to decommissioning activities.

Cumulative Impacts:

- Cumulative effect of construction activities of several WEFs within 50 km from the proposed Komas WEF site. Although solar PV facilities have some impact in terms of habitat destruction, only WEFs were considered, as the operational cumulative impact of wind is the more severe and not comparable to the minor impact of solar PV facilities on bats.
- Cumulative resident bat mortality due to all the WEFs;
- Cumulative bat mortality due to direct collisions with the blades or barotrauma during foraging of migrating bats; and
- Cumulative reduction in the size, genetic diversity, resilience, and persistence of bat populations.

For the cumulative effect, the total output of approximately 1 063.7 MW for wind farm developments within a 50 km radius of the proposed Komas WEF, was considered. With Komas WEF added to this, the output will be 1 363.7 MW. Although not all the bat studies undertaken as part of a BA/ EIA of proposed wind farms within the 50 km radius were available, the bat monitoring reports of the wind farms directly adjacent to the proposed Komas WEF, were obtained. The collective Bat Index, thus the mean number of bats per hour per year, using Kap Vley, Namas, Kleinzee, Zonnequa and Komas WEFs, is calculated at **0,18**. According to the threshold levels of the Bat Guidelines (Sowler et al. 2017), this is classified as **high**. This is exacerbated by the fact that most bats occurring at these farms are medium-high or high risk species. If mitigation is diligently conducted at all these wind farms, this impact could be reduced.

D.2.4.4 Proposed mitigation measures

The following mitigation measures are proposed for the proposed Komas WEF:

1. **Turbine positions**

   The first step in mitigating the potential negative impacts of a proposed WEF on bats is to site turbines outside of sensitive areas. The applicant has already updated the initial turbine layout to exclude turbines or turbine components from the high bat sensitivity zones (see Figure 30 of the Bat Impact Assessment included in Appendix C.4 of this BA Report).

2. **Curtailment**[11]

   A. **Curtailment** to be implemented immediately from the onset of the turbines situated within the medium to high sensitivity zone, thus the moment the turbines start to turn. Therefore, turbines, WTG 23, WTG 24, WTG 37 WTG 38 and WTG 50 are not allowed to turn during the months, time periods and conditions indicated in the table below: If the developer decides to reduce the number of turbines, the first option, after the wind regime is taken into account, should be to reduce the turbines in the medium to high sensitivity zone. If a substantial number of turbines in the medium sensitivity zone is reduced, it will be at the discretion of the operational bat specialist as to whether some of the curtailment at the medium to high zone could be relieved. Operational monitoring and carcass searches will have to inform this decision.

CURTAILMENT FOR TURBINES NUMBERED WTG23, WTG24, WTG37, WTG38 AND WTG50			
Months	**Time periods**	**Temperature (°C)**	**Wind speed (m/s)**
February	19:00 – 02:00	Between 14 and 19 °C	Between 2.5 and 9 m/s
March	19:00 – 02:00	Between 14 and 19 °C	Between 2.5 and 9 m/s
April	19:00 – 02:00	Between 14 and 19 °C	Between 2.5 and 9 m/s

[11] Curtailment entails locking or feathering the turbine blades during high bat activity periods to reduce the risk of bat mortality via collision with blades and barotrauma. This results in a reduction of the power generation during conditions when electricity would usually be supplied (taken from the Bat Impact Assessment Report (Appendix C.4 of this BA Report).

B. Additional Curtailment to be implemented, under the advice and supervision of the bat specialist to be appointed at the start of the operational phase, when medium and high estimated true bat mortality is experienced.

MITIGATION FOR TURBINE NUMBERS WTG23, WTG24, WTG37, WTG38 and WTG50, or as advised by the bat specialist			
Months	**Time periods**	**Temperature (°C)**	**Wind speed (m/s)**
September	19:00 – 02:00	Between 14 and 22 °C	Between 2.5 and 9 m/s
December	19:00 – 02:00	Between 14 and 22 °C	Between 2.5 and 9 m/s
January	19:00 – 02:00	Between 14 and 22 °C	Between 2.5 and 9 m/s

3. Feathering and Freewheeling of turbine blades

Normally operating turbine blades are at right angles to the wind. To avoid bat fatality at areas highly sensitive to bat activity, feathering as a mitigation measure is applied and the angle of the blades is pitched parallel with the wind direction and so that the blades only spin at very low rotation and minimal movement (not complete standstill) to prevent. The turbines will not come to a complete standstill, but the movement of the turbines would be minimal so that to prevent bat fatalities are prevented during conditions when power is not generated.

The cut-in speed is the lowest wind speed at which turbines generate power. Free-wheeling occurs when turbine blades are allowed to rotate below the cut-in speed and thereby increase the risk of collision at areas already highly sensitive to bat activity. Freewheeling should be prevented as much as possible, and to an extent that bat mortality is avoided below cut-in speed and should commence immediately after installation for the duration of the project to prevent bat mortality.

4. Bat deterrents

Bat deterrents are a developing technology that works on the principle of emitting ultrasonic noise that prevents bats from echolocating and therefore cause bats to avoid the area. Not enough research is done in South Africa to establish the success of bat deterrents yet, but this mitigation measure could be used together with curtailment, or even as an alternative, depending on research and the consequent opinion of the operational bat specialist and SABAA. During post construction, turbines with high mortality could be specifically targeted for bat deterrents.

Bat deterrent suppliers indicate that Molossidae bats react well to deterrents. This could be an option for mitigation but will have to be discussed with a bat specialist and the applicant. Deterrents are now deployed at two operational wind farms in South Africa and the current bat specialist, Ms Stephanie Dippenaar, is managing one of these WEFs. They are awaiting bat monitoring information to ascertain the effectiveness of the deterrents.

All turbine components should be excluded from no-go areas as indicated on the bat sensitivity map. Mitigation is recommended, as per Section 9 of the Bat Impact Assessment (Appendix C.4 of this BA Report) and summarised in section A above in section D 2.4.4 of this BA Report, for the turbines situated within the medium to high sensitivity zones. The rest of the proposed Komas WEF site is classified as medium sensitivity. Operational monitoring should inform the extent of mitigation required, but due to the bat activity being above the threshold, there is a possibility that more stringent mitigation would be required and would need to be implemented by the developer. The threshold

range is specified in the Bat Guidelines (Sowler et al. 2017) (0 to >13 bat passes per hour, with >13 pointing to a high class (an upper class) of the Succulent Karoo bat threshold. Therefore, the developer needs to include this in the financial cost structure from the start of the project.

D.2.4.5 Impact Assessment

The table below includes an assessment of the potential **direct impacts** to bats identified for the proposed Komas WEF and associated infrastructure for the construction, operational and decommissioning phases. It also includes an assessment of the potential cumulative impacts. The full assessment is provided in the Bat Impact Assessment (Appendix C.4 of the BA Report).

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
CONSTRUCTION PHASE: DIRECT IMPACTS			
Active roost destruction and potential roost destruction.	• Keep construction activities out of high sensitive areas for bats. • Avoid destruction of rock formations along southern ridge lines. • Avoid destruction of trees. • Take care before destroying dense bushes to avoid unnecessary roost destruction. • All aardvark holes, derelict holes or excavations should be carefully investigated for bat roosts before destruction.	**Moderate**	**Low**
Creating new habitat amongst the turbines which might attract bats. This include buildings with roofs that could serve as roosting space or open water sources from quarries or excavation where water could accumulate.	• Completely seal off roofs of new buildings (e.g. SS and site buildings). Note a small bat species could enter a hole the size of one- by- one centimetres. • Roofs need to be regularly inspected during the lifetime of the wind farm and any new holes need to be sealed. • Excavation areas or artificial depressions should be filled and rehabilitated to avoid creating areas of open water sources which could attract bats during rainy spells.	**Moderate**	**Very Low**
Construction noise, especially during night-time.	• Nightly construction activities should be avoided, or if necessary, minimised to the shortest period possible. • With the exception of compulsory civil aviation lighting, artificial lighting during construction should be minimised, especially bright	**Moderate**	**Low**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
	lights or spotlights. • Lights should avoid skyward illumination. Turbine tower lights should be switched off when not in operation, where possible.		
OPERATIONAL PHASE: DIRECT IMPACT			
Fatality of resident bats through direct collision or barotrauma.	• Mitigation as proposed in Section A above in section D 2.4.4 of this BA Report as well as in Section 9.2 (Table 7) of the Bat Impact Assessment (Appendix C.4) should be applied from the start of operation of the turbines for the site as a whole. Mitigation measures must be adapted by a bat specialist as data is collected during the operational phase. • Mitigation as proposed for Medium to High sensitivity zones indicated in Section B above and in Section 9.2 (Table 8), of the Bat Impact Assessment (Appendix C.4), must be adhered to as from the start of operation of the turbines. If the developer decides to reduce the number of turbines, the first option, after the wind regime is taken into account, should be to reduce the turbines in the medium to high sensitivity zone. If a substantial number of turbines in the medium sensitivity zone is reduced, it will be at the discretion of the operational bat specialist as to whether some of the dfsfr at the medium to high zone could be relieved. Operational monitoring and carcass searches will have to inform this decision. • A suitably qualified bat specialist must be appointed at the start of the operational phase. Careful observation should take place during post-construction and mitigation should be discussed between the bat specialist and Project Developer. Mitigation should be adapted and implemented without delay. Where high bat mortality occurs, those turbines should be mitigated, using Section B above in section D 2.4.4	**High**	**Moderate**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
	of this BA Report and Section 9.2 (Table 8) of the Bat Impact Assessment (Appendix C.4), as a starting point for discussions. • With the exception of compulsory civil aviation lighting, artificial lighting should be minimised, especially bright lights. Lights should rather be turned downwards. Turbine tower lights should be switched off when not in operation, if possible. • At least two years of post-construction bat monitoring is to be conducted and must be performed according to the South African Good Practice Guidelines for Operational Monitoring for Bats at Wind Energy facilities (Aronson, et. al., 2020) or later versions valid at the time of monitoring, as well as other relevant South African guidelines as applicable during the monitoring period. • It is understood that static monitoring equipment for bats on turbines has a cost implication. Although it is not a requirement at this stage, as it depends on whether the Met mast will be deployed for the life span of the turbines, but having more refined static data from sampling points at height, would aid in interpreting future fatality records of the wind farm; therefore, the installation of more than one monitoring system at height, will be recommended. • Ultrasound should be investigated for use at turbines displaying high mortality.		
Bat fatality of migratory species through direct collision or barotrauma.	• Mitigation measures as described above for the impact regarding the fatality of resident bats through direct collision or barotrauma (as contained in Section 11.2.1 of the Bat Impact Assessment (Appendix C.4)).	**Low**	**Low**
Loss of bats of conservation value.	• Mitigation measures as described above for the impact regarding the fatality of resident bats through direct collision or barotrauma (as	**Low**	**Low**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
	contained in Section 11.2.1 of the Bat Impact Assessment (Appendix C.4)). Proven mitigation measures, such as curtailment, should be applied if high numbers of bat passes concerned with bats of conservation value is recorded during post-construction.		
Bat fatality due to the attraction of bats to turbine blades.	• Investigate ultrasonic deterrents and implement at turbines with high fatality.	**Low**	**Low**
Loss of habitat and foraging space during operation of the wind turbines.	• Mitigation measures as described above for the impact regarding the fatality of resident bats through direct collision or barotrauma (as contained in Section 11.2.1 of the Bat Impact Assessment (Appendix C.4)).	**High**	**Moderate**
OPERATIONAL PHASE: INDIRECT IMPACT			
Reduction in size, genetic diversity, resilience, and persistence of bat populations.	• Mitigation measures as described above for the impact regarding the fatality of resident bats through direct collision or barotrauma (as contained in Section 11.2.1 of the Bat Impact Assessment (Appendix C.4)). Care should be taken during post construction monitoring to verify the numbers of this species, especially within the RSA of the turbine blades.	**High**	**Moderate**
DECOMMISSIONING PHASE: DIRECT IMPACT			
Bat disturbance due to decommissioning activities and noise, especially during night-time.	• Nightly decommissioning activities should be avoided, or if necessary, minimised to the shortest period possible. • Except for compulsory lighting required in terms of civil aviation, artificial lighting during construction should be minimised, especially bright lights or spotlights. • Lights should avoid skyward illumination.	**Low**	**Very Low**
CUMULATIVE IMPACTS			
CONSTRUCTION PHASE			

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
Cumulative effect of construction activities of several WEFs within 50 km from the proposed Komas WEF site. Cumulative effect of destruction of active roosts due to several WEFs as well as features that could serve as potential roosts.	• Project specific mitigation should be adhered to, especially adhering to buffer zones and sensitivity areas and recommended mitigation, for each renewable energy project. • Post construction bat monitoring as per the relevant Bat South African guidelines.	**Moderate**	**Low**
CUMULATIVE IMPACTS			
OPERATIONAL PHASE: DIRECT IMPACTS			
Cumulative bat mortality of **resident bats** due to direct blade impact or barotrauma during foraging of migrating bats on several wind farms.	• Although not enforceable on the Project Applicant it is recommended that the project specific mitigation should be adhered to and each wind farm should apply specific mitigation measures as recommended. • Although not enforceable on the Project Applicant it is recommended that the buffer zones and sensitivity areas should be adhered to and recommended mitigation, for each renewable energy project. Post construction monitoring as per the relevant bat guidelines in South Africa. • Post construction monitoring as per the relevant bat guidelines in South Africa.	**High**	**High**
Cumulative bat mortality of **migrating bats** due to direct blade impact or barotrauma during foraging of migrating bats on several wind farms.	• Although not enforceable on the Project Applicant it is recommended that the project specific mitigation should be adhered to and each wind farm should apply specific mitigation measures as recommended. • Although not enforceable on the Project Applicant it is recommended	**Moderate**	**Low**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
	that the buffer zones and sensitivity areas should be adhered to and recommended mitigation, for each renewable energy project. • Post construction monitoring as per the relevant guidelines in South Africa.		
Habitat loss over several wind farms.	• Although not enforceable on the Project Applicant it is recommended that the project specific mitigation should be adhered to, especially adhering to buffer zones and sensitivity areas and recommended mitigation, for each WEF. • Post construction monitoring as per the relevant guidelines in South Africa.	**Moderate**	**Low**
CUMULATIVE IMPACTS			
OPERATIONAL PHASE: INDIRECT IMPACTS			
Cumulative reduction in the size, genetic diversity, resilience and persistence of bat populations	• Although not enforceable on the Project Applicant it is recommended that the project specific mitigation should be adhered to and each wind farm should apply specific mitigation measures as recommended. • Although not enforceable on the Project Applicant it is recommended that the buffer zones and sensitivity areas should be adhered to and recommended mitigation, for each renewable energy project. • Post construction monitoring as per the relevant bat guidelines in South Africa.	**High**	**Low**

D.2.4.6 Comparative Assessment of Alternatives

No turbine layout alternatives were provided; however, the initial turbine layout was re-designed after specialist input to avoid environmental sensitive areas on site. Alternatives were provided for the BESS and on-site SS complex area (Option 1 and Option 2). Apart from habitat destruction, the negative impact of an onsite SS on insectivorous bats should be low. There is no preference from a bat perspective and both options are acceptable.

D.2.4.7 Assessment of No-Go Alternative

Although the No-Go alternative was investigated, it is understandable that this is a renewable energy development within the REDZ, and development is inevitable. One development option, i.e. the proposed WEF, was provided, which is the preferred option.

D.2.4.8 Concluding statement

According to the likelihood of fatality risk, as indicated by the South African Good Practice Guidelines for Surveying Bats in Wind Farm Development - Pre-construction (Sowler et. al. 2017), *Tadarida aegyptiaca* (Egyptian free-tailed bat of the *Molossidae* family) is the most dominant species on site, with nearly all the calls recorded at the high monitoring system, situated within the rotor swept area of the proposed turbine blades. These are high risk bats as they are adapted to foraging at high altitudes. Limited activity has been recorded by *M. natalensis*, the only red data species noted at the proposed Komas WEF site. Although the Molossidae species, *T. aegyptiaca* and *S. petrophilus*, have a conservation status of Least Concern, abundant species are valuable to local ecosystems as their contribution to ecological services is greater due to their high numbers.

The extent to which bats may be affected by the proposed Komas wind farm will depend on the extent to which the proposed development area is used for foraging or as a flight path by local bats. The most important aspect of the project that would affect bats adversely is the wind turbines themselves, and direct collisions and barotrauma because of operational turning blades. Some of the other main potential negative impacts to bats include loss of foraging habitat, loss of existing and potential roosts and attracting bats by artificially creating new bat conducive areas.

During the pre-construction monitoring period, the nightly mean bat activity was higher than the highest threshold figures for Succulent Karoo for the site as a whole. Therefore, bat populations might be severely negatively impacted upon by the proposed Komas WEF development, should the development progress without the implementation of the recommended mitigation measures. The monitoring system stationed at high altitude (110 m) was used to plot bat activity and weather conditions to describe the relationship between bats and weather conditions on site, in particular the activity within the rotor swept area of the turbine blades. This information was then used to develop a mitigation scheme for the proposed Komas WEF.

As indicated above, the mean number of bats per hour per year for the proposed Komas WEF as well as the surrounding authorised WEFs, are calculated at 0,18. According to the threshold levels of the South African Good Practice Guidelines for Surveying Bats in Wind Farm Development - Pre-construction (Sowler *et al*. 2017), this Bat Index is classified as high. This is excarbated if one considers that most bats are high risk species. It is therefore evident that due to the large area and the bat activity for the Succulent Karoo biome, the cumulative effect would be high. If mitigation is diligently conducted at all WEFs, this impact could be reduced.

All bat species observed at the proposed Komas WEF site were more active between February and May, with a peak in activity around March 2020. High bat activity was also observed in September 2020, during spring. The highest bat activity was recorded in the southern section of the farm. In general, bats seem to be active from about two hours after sunset, while a gradual decline of activity is shown from 0:00 to sunrise.

All turbines components should be excluded from the no-go areas as indicated on the bat sensitivity map (Figures D.8 and D.12 of this BA Report). The revised turbine layout avoids these areas. Mitigation is recommended, as per Section 9.2 (Table 8) of the Bat Impact Assessment (Appendix C.4 of this BA Report), for the turbines situated within the medium-high sensitivity zones. The remainder of the proposed Komas WEF site is classified as of medium sensitivity and if it is recommended that mitigation measures (such as feathering of blades parallel with wind direction) are applied so that blades turn at very low rotation and minimal movement (not complete standstill) to prevent bat fatalities during conditions when power is not generated.

The following mitigation measures are proposed:

- Curtailment to be implemented as specified in Section 9.2, Table 7 of the Bat Impact Assessment (Appendix C.4 of this BA Report) immediately from the onset of the turbines situated within the medium-high sensitivity zone, thus the moment the turbines start to turn. If the number of turbines are reduced, the developer could consult with the operational bat specialist as to whether curtailment could also be reduced, after more data becomes available.

- Curtailment as specified in Section 9.2, Table 8 of the Bat Impact Assessment (Appendix C.4 of this BA Report), for those turbines situated in the medium sensitivity zone, if necessary and with the advice of the operational bat specialist.

- Freewheeling: The cut-in speed is the lowest wind speed at which turbines generate power. Freewheeling occurs when turbine blades are allowed to rotate below the cut-in speed and thereby increase the risk of collision at areas already highly sensitive to bat activity. Freewheeling should be prevented as much as possible by curtailing blade rotation when turbines are not generating power and feathering of blades parallel to the wind will reduce blade rotation to avoid bat mortality.

- Bat deterrents could be an option for mitigation but will have to be investigated.

Operational monitoring should inform the extent of mitigation required, but due to the general high Bat Index, it is likely that more stringent mitigation might need to be implemented.

It should be noted that 12-months pre-construction bat monitoring is required in terms of the South African Good Practice Guidelines for Surveying Bats in Wind Energy Facility Developments – Pre-Construction (Sowler, et al. 2017), but the semi-desert Succulent Karoo environment is subjected to erratic climate conditions which vary from year to year. These changes could result in changes in the bat activity and occurrence which have not been accounted for in this report. If the proponent adheres to the proposed mitigation measures, the potential impact on bats from the proposed Komas Wind Farm is predicted to be Negative and of Moderate significance. **It is therefore the opinion of the bat specialist, based on the one-year pre-construction monitoring which was undertaken at the proposed Komas WEF site, that EA may be granted for the proposed Komas WEF development.**

D.2.5 Visual (including Flicker) Impact Assessment

The VIA (including Flicker) was undertaken by SiVEST SA (Pty) Ltd to inform the outcome of this BA from a visual perspective. The VIA was undertaken in accordance with Appendix 6 of the NEMA EIA Regulations, 2014, as amended. The complete VIA is included in Appendix C.5 of this report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the VIA. The information below is extracted from SiVEST SA (2020) (Appendix C.5 of the BA Report).

D.2.5.1 Approach and Methodology

The VIA is based on a combination of desktop-level assessment supported by field-based observation.

- Physical landscape characteristics

Physical landscape characteristics such as topography, vegetation and land use are important factors influencing the visual character and visual sensitivity of the study area. Baseline information about the physical characteristics of the study area was initially sourced from spatial databases provided by National Geospatial Information (NGI), the South African National Biodiversity Institute (SANBI) and the South African National Land Cover Dataset (Geoterraimage – 2018). The characteristics identified via desktop means were later verified during the site visit.

- Identification of sensitive and potentially sensitive receptor locations

Visual receptor locations and routes that are sensitive and / or potentially sensitive to the visual intrusion of the proposed development were assessed in order to determine the impact of the proposed development on each of the identified receptor locations.

- Fieldwork and photographic review

A four (4) day site visit was undertaken between the 10th and the 13th of February 2020 (mid-summer). The aim of the site visit was to:

a. verify the landscape characteristics identified via desktop means;
b. conduct a photographic survey of the proposed study area;
c. verify the sensitivity of visual receptor locations identified via desktop means;
d. eliminate receptor locations that are unlikely to be influenced by the proposed development;
e. identify any additional visually sensitive receptor locations within the study area; and
f. assist with the impact rating assessment from visually sensitive receptor locations.

- Photomontages

An indicative range of locations (referred to as “view points”) was selected for modelling purposes and photomontages were produced from these viewpoints. The preliminary wind turbine layout for the proposed Komas WEF, as provided by the Applicant, was modelled in 3D at the correct scale and then superimposed onto landscape photographs taken during the site visit. Although the turbine layout has subsequently changed, the resulting photomontages still demonstrate the likely visibility of the proposed turbines from various locations within the visual assessment zone and also illustrate how

views from each selected view point could potentially be transformed by the proposed Komas WEF development if the wind turbines are erected on the site as proposed.

D.2.5.2 Relevant Project Aspects relating to Visual Impacts

Detailed below is a preliminary list of the key components of the proposed Komas WEF development that have visual implications. Although the associated on-site infrastructure has been included here, the visual impact of associated infrastructure is generally far less significant than the visual impact associated with wind turbines. The infrastructure would however, magnify the visual prominence of the proposed development if located on ridge tops or flat sites in natural settings where there is limited tall wooded vegetation present to conceal the impact.

- **Turbines**

Wind turbines proposed for the Komas WEF will have a hub height of up to 200 m, a rotor diameter of up to 200 m and a blade length of up to 100 m (Figure D.4), resulting in a maximum height at the blade tip of 300 m. At this stage, it is proposed that up to 50 turbines will be constructed. The height of the turbines and their location on relatively flat terrain would result in the development typically being visible over a large area.

Internationally, studies have demonstrated that there is a direct correlation between the number of turbines and the degree of objection to a WEF, with less opposition being encountered when fewer turbines are proposed (Devine-Wright, 2005). Certain objectors to wind energy developments also mention the “sky space” occupied by the rotors of a turbine. As well as height, "sky space" is an important issue. “Sky space” refers to the area in which the rotors would rotate.

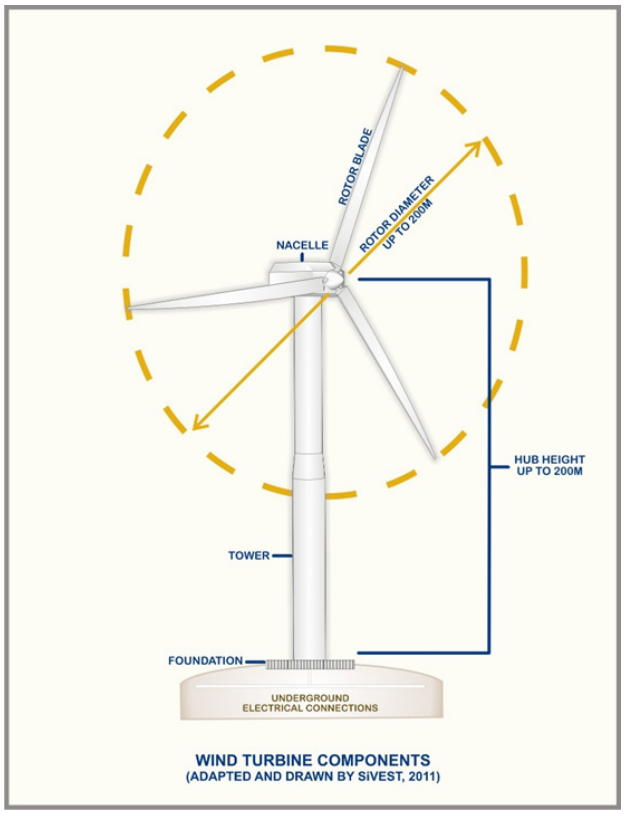


Figure D.4: Typical components of a wind turbine

The visual prominence of the development would be exacerbated within natural settings, in areas of flat terrain or if located on a ridge top. Even dense stands of wooded vegetation are likely to offer only partial visual screening, as the wind turbines are of such a height that they will rise above even mature large trees.

- **Shadow flicker**

Shadow flicker is an effect which is caused when shadows repeatedly pass over the same point. It can be caused by wind turbines when the sun passes behind the hub of a wind turbine and casts a

shadow that continually passes over the same point as the rotor blades of the wind turbine rotate (http://www.ecotricity.co.uk).

The effect of shadow flicker is only likely to be experienced by people situated directly within the shadow cast by the rotor blades of the wind turbine. As such, shadow flicker is only expected to have an impact on people residing in houses located within close proximity of a wind turbine (less than 500 m) and at a specific orientation, particularly in areas where there is little screening present. Shadow flicker may also be experienced by and impact on motorists if a wind turbine is located in close proximity to an existing road. The impact of shadow flicker can be effectively mitigated by choosing the correct site and layout for the wind turbines, taking the orientation of the turbines relative to the nearby houses and the latitude of the site into consideration. Tall structures and trees will also obstruct shadows and prevent the effect of shadow flicker from impacting on surrounding residents (http://www.ecotricity.co.uk).

- **Motion-based visual intrusion**

An important component of the visual impacts associated with wind turbines is the movement of the rotor blades. Labelled as motion-based visual intrusion, this refers to the inclination of the viewer to focus on discordant, moving features when scanning the landscape. Evidence from surveys of public attitudes towards WEFs suggest that the viewing of moving rotor blades is not necessarily perceived negatively (Bishop and Miller, 2006). The authors of the study suggest two possible reasons for this; firstly, when the turbines are moving they are seen as being 'at work', 'doing good' and producing energy. Conversely, when they are stationary they are regarded as a visual intrusion that has no evident purpose. More interestingly, the second theory that explains this perception is related to the intrinsic value of wind in certain areas and how turbines may be an expression or extension of an otherwise 'invisible' presence.

Famous winds across the world include the Mistral of the Camargue in France, the Föhn in the Alps, or the Bise in the Lavaux region of Switzerland. The wind, in these cases, is an intrinsic component of the landscape being expressed in the shape of trees or drifts of sands, but being otherwise invisible. The authors of the study argue that wind turbines in these environments give expression, when moving, to this quintessential landscape element. In a South African context, this phenomenon may well be experienced if wind farms are developed in areas where typical winds, like berg winds, or the south-easter in the Cape are an intrinsic part of the environment. In this way, it may even be possible that wind farms will, through time, form part of the cultural landscape of an area, and become a representation of the opportunities presented by the natural environment.

BESS and On-site Substation complex

The BESS and on-site SS structures are generally large, highly visible structures which are more industrial in character than the other components of a WEF. In the context of a largely natural landscape, the new BESS and on-site SS complex will be perceived to be highly incongruous. However, the BESS and on-site SS complex would likely be perceived as a part of the proposed Komas WEF complex and as such, the BESS and SS complex would be dwarfed by the large number of turbines that would be visible. The proposed BESS and on-site SS complex is thus not expected to be associated with any significant visual impacts, or even a measurable cumulative impact. At this stage, two (2) BESS and on-site SS complex site alternatives (i.e. Option 1 and Option 2) have been identified for assessment during the BA process.

- **Overhead Power lines/underground cabling**

Wind turbines will be connected to the proposed on-site SS using medium voltage (33 kV) underground cabling. Excavations associated with the power lines may become prominent if they create a linear feature that contrasts with the surrounding vegetation.

Figure D.5 below shows the process typically associated with the generation of electricity from WEFs.

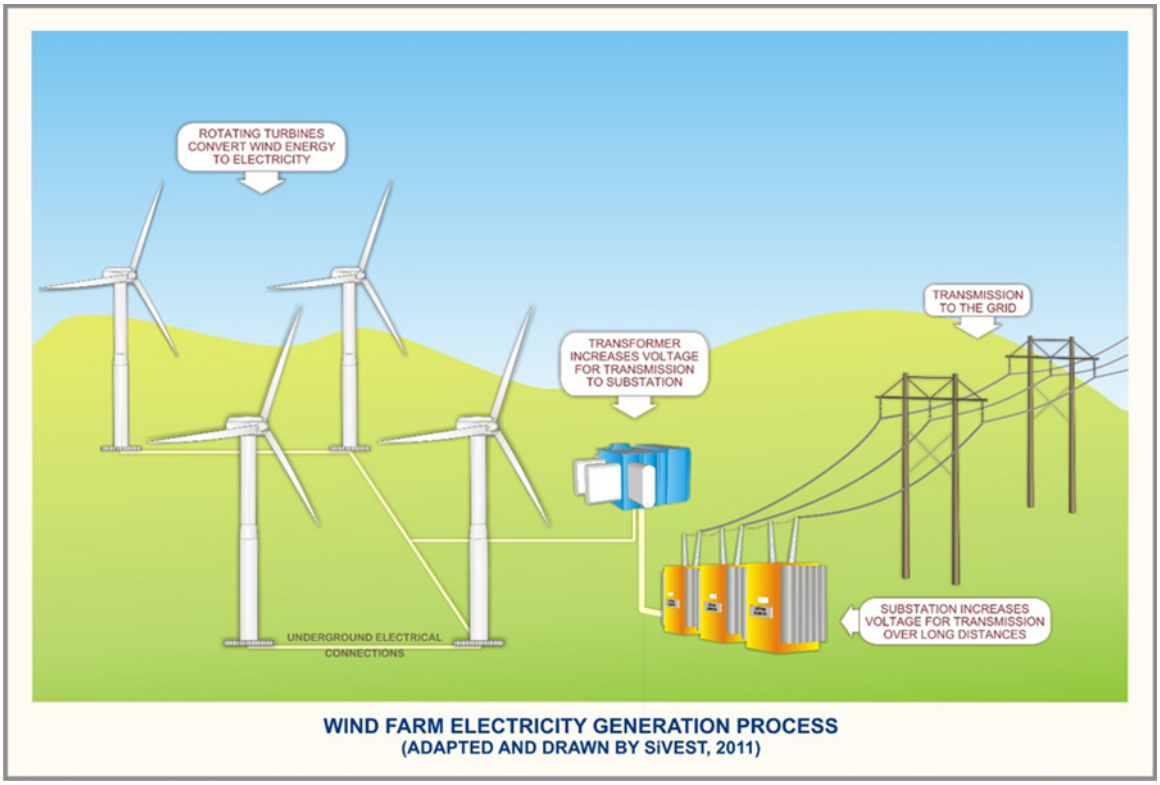


Figure D.5: Conceptual wind farm electricity generation process showing electrical connections.

- **Access Roads**

Access roads may become visually prominent if they create linear features which contrast with the surrounding landscape. The level of contrast would increase where the roads require the cutting of 'terraces' into steep-sided slopes or across contours. Considering that the proposed access roads will be mostly located on flat terrain, it is likely that visual impacts associated with the construction of these access roads will be reduced. If, however these roads are not maintained correctly during the construction phase, vehicles travelling along the gravel access roads could expose surrounding farmsteads / homesteads to dust plumes.

- **Construction Laydown Areas**

From a visual perspective, laydown areas could result in visual impacts if they are placed in prominent positions such as on ridge tops. In these locations, buildings may break the natural skyline, drawing the attention of the viewer.

The visual impact of infrastructure associated with a WEF is generally not regarded as a significant factor when compared to the visual impact associated with wind turbines. The infrastructure would however increase the visual "clutter" of the WEF and magnify the visual prominence of the

development if located on ridge tops or flat sites in natural settings where there is limited tall wooded vegetation to conceal the impact.

D.2.5.3 Potential Impacts

The potential visual impacts resulting from the proposed Komas WEF project on landscape features and receptors are listed below for each of the project phases, including cumulative impacts. The impacts identified are direct and cumulative impacts. No indirect impacts have been identified.

Construction Phase:

- Potential visual intrusion resulting from large construction vehicles and equipment;
- Potential visual effect of construction laydown areas and material stockpiles;
- Potential impacts of increased dust emissions from construction activities and related traffic;
- Potential visual pollution resulting from littering on the construction site; and
- Potential visual scarring of the landscape as a result of site clearance and earthworks.

The construction activities may result in large trucks travelling to and from the development site. This will impact on the natural character of the study area. The increased traffic on these roads and the dust plumes will create a visual impact. In addition, surface disturbance during construction would also result in a greater amount of bare soil being exposed which could result in a greater visual contrast with the surrounding environment.

The assessment revealed that the proposed WEF will have a negative low visual impact significance during construction, with the implementation of the recommended mitigation measures.

Operational Phase:

- Potential alteration of the visual character of the area;
- Potential visual intrusion resulting from wind turbines dominating the skyline in a largely natural / rural area;
- Potential visual clutter caused by the SS and other associated infrastructure on-site;
- Potential visual effect on surrounding farmsteads; and
- Potential alteration of the night-time visual environment as a result of operational and security lighting as well as navigational lighting on top of the wind turbines.

Overall, the sparse human habitation and the predominance of natural vegetation cover across much of the study area would give the viewer the general impression of a largely natural rural setting. As such, WEF development would alter the visual character and contrast significantly with the typical land use and/or pattern and form of human elements present across the broader in the study area.

The area is not however typically valued or utilised for its tourism significance and there is limited human habitation resulting in relatively few potentially sensitive receptors in the area. The proposed development will have a high level of impact on three (3) of these receptors, a medium level of impact on seven (7) identified receptors and negligible impact on the remaining three (3) receptors-please refer to the table below.

Summary: Potentially sensitive visual receptor rating

Receptor Location	Distance to Nearest Turbine	Screening	Contrast	overall Impact Rating
R02 – Farmstead	Medium (2)	Medium (2)	High (3)	**MEDIUM (7)**
R03 – Farmstead	High (3)	Medium (2)	High (3)	**HIGH (8)**
R04 – Farmstead	Medium (2)	Medium (2)	High (2)	**MEDIUM (6)**
R05 – Farmstead	Low (1)	High (3)	Medium (2)	**MEDIUM (6)**
R06 – Farmstead	>10KM FROM NEAREST TURBINE			**NEGLIGIBLE**
R10 – Farmstead	Low (1)	Medium (2)	Medium (2)	**MEDIUM (5)**
R12 – Farmstead	Low (1)	High (3)	High (3)	**MEDIUM (7)**
R14 – Farmstead	High (3)	High (3)	High (3)	**HIGH (9)**
R15 – Farmstead	Medium (2)	High (3)	High (3)	**HIGH (8)**
R16 – Farmstead	>10KM FROM NEAREST TURBINE			**NEGLIGIBLE**
R18 – Farmstead	Low (1)	Medium (2)	High (3)	**MEDIUM (6)**
R20 – Farmstead	>10KM FROM NEAREST TURBINE			**NEGLIGIBLE**
R21 – Farmstead	Low (1)	Medium (2)	High (3)	**MEDIUM (6)**

The assessment revealed that the proposed WEF will have a negative moderate visual impact during operation, with relatively few mitigation measures available to reduce the visual impact.

Decommissioning Phase:

- Potential visual intrusion resulting from vehicles and equipment involved in the decommissioning process; and
- Potential impacts of increased dust emissions from decommissioning activities and related traffic.

Cumulative Impacts:

- Combined visual impacts from several renewable energy facilities in the broader area during the construction and operation phases could potentially alter the sense of place and visual character of the area; and

- Combined visual impacts from several renewable energy facilities in the broader area during construction and operations phases could potentially exacerbate visual impacts on visual receptors.

Several renewable energy developments are being proposed within a 50 km radius of the proposed Komas WEF application site. These renewable energy developments have the potential to cause large scale visual impacts and the location of several such developments in close proximity to each other, could significantly alter the sense of place and visual character in the broader region. It was however determined, that only five of these would have any significant impact on the landscape within the study area, these being; the proposed Gromis WEF which is subject to another BA process which is currently being undertaken, the proposed Kleinzee WEF and the proposed Kap Vley, Namas and Zonnequa WEFs (which have received EAs on 25 October 2018, 18 February 2019 and 25 February 2019 respectively). All of these projects are in close proximity to one another and to the proposed Komas WEF development area and it is anticipated that this concentration of facilities will alter the inherent sense of place and introduce an increasingly industrial character into a largely rural area. This will result in significant cumulative impacts, rated as having negative impacts of moderate significance during both construction and operation phases of the project. It is however anticipated that these impacts could be mitigated to acceptable levels with the implementation of the recommendations and mitigation measures stipulated for each of these developments by the visual specialists.

It should be noted that the study area is located within the Springbok REDZ (known as REDZ 8), and thus the relevant authorities support the concentration of renewable energy developments in this area. In addition, it is possible that the three WEFs (i.e. the Kap Vley, Namas and Zonnequa WEFs) in close proximity to each other could be seen as one large WEF rather than three separate developments. Although this will not necessarily reduce impacts on the visual character of the area, it could potentially reduce the cumulative impacts on the landscape.

D.2.5.4 Impact Assessment

The table below includes a summary of the assessment of the potential **direct visual impacts** identified for the proposed Komas WEF and associated infrastructure for the construction, operational and decommissioning phases. It also includes a summary of the cumulative impacts. The full assessment is provided in the VIA (Appendix C.5 of the BA Report).

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
CONSTRUCTION PHASE: DIRECT IMPACTS			

Visual intrusion, visual effect of construction laydown areas and material stockpiles, visual pollution resulting from littering on the construction site, landscape scarring and dust emissions.	• Carefully plan to minimise the construction period and avoid construction delays.
	• Position laydown areas and related storage / stockpile areas in unobtrusive positions in the landscape, where possible.
	• Minimise vegetation clearing and rehabilitate cleared areas as soon as possible.
	• Vegetation clearing should take place in a phased manner.
	• Make use of existing gravel access roads where possible.
	• Limit the number of vehicles and trucks travelling to and from the proposed sites, where possible.
	• Ensure that dust suppression techniques are implemented:
	  ○ on all access roads;
	  ○ in all areas where vegetation clearing has taken place; and
	  ○ on all soil stockpiles.
	• Maintain a neat construction site.
		Moderate	**Low**

OPERATIONAL PHASE: DIRECT IMPACTS			
Alteration of visual character of the area, visual intrusion resulting from wind turbines dominating the skyline in a largely natural / rural area, Kap Vley, Namas and Zonnequa WEFs visual	<u>Design Phase:</u> • In areas of 'Very High' and 'High Sensitivity', the number of turbines should be limited, where possible. • No turbines should be placed within 500 m of the dwellings or farmsteads which are situated within the proposed Komas WEF development area (i.e. 500 m	**Moderate**	**Moderate**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
clutter caused by the SS and other associated infrastructure on-site, dust emissions, visual effect on surrounding farmsteads, and light pollution and glare (i.e. alteration of the night-time visual environment as a result of operational and security lighting as well as navigational lighting on top of the wind turbines).	exclusion buffers – see Figures D.9 and D.12). • Where possible, fewer but larger turbines with a greater output should be utilised rather than a larger number of smaller turbines with a lower capacity. • Turbine colours should adhere to the SACAA requirements. <u>Operational Phase:</u> • If possible, turbines should be painted plain white, as this is a less industrial colour. Bright colours and logos on the turbines should be kept to a minimum. • Inoperative turbines should be repaired promptly, as they are considered more visually appealing when the blades are rotating (or at work) (Vissering, 2011). • If turbines need to be replaced for any reason, they should be replaced with the same model, or one of equal height and scale. Repeating elements of the same height, scale and form can give the impression of unity which will lessen the visual impact that would typically be experienced in a chaotic landscapes made up of diverse colours, textures and patterns (Vissering, 2011). • Light fittings for security at night should reflect the light toward the ground and prevent light spill. • Where practically possible, the O&M buildings should not be illuminated at night. • Cables should be buried underground where feasible. • The O&M buildings should be painted with natural tones that fit with the surrounding environment. Non-reflective surfaces should be utilised where possible. • Unless there are water shortages, dust suppression techniques must be implemented on all access roads.		
DECOMMISSIONING PHASE: DIRECT IMPACTS			

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
Visual intrusion and dust emissions.	• Carefully plan to reduce the decommissioning period. • Minimise vegetation clearing and rehabilitate cleared areas as soon as possible. • Maintain a neat decommissioning site by removing rubble and waste materials regularly. • Make use of existing gravel access roads where possible. • Dust suppression techniques must be implemented on all gravel access roads.	**Moderate**	**Low**
CUMULATIVE IMPACTS			
CONSTRUCTION ACTIVITIES			

Visual intrusion and dust emissions.
Combined visual impacts from several renewable energy facilities in the broader area during the construction phase could potentially alter the sense of place and visual character of the area.
Combined visual impacts from several renewable energy facilities in the broader area during construction phase could potentially exacerbate visual impacts on visual receptors.
	• Carefully plan to minimise the construction period and avoid construction delays.
	• Position laydown areas and related storage/stockpile areas in unobtrusive positions in the landscape, where possible.
	• Minimise vegetation clearing and rehabilitate cleared areas as soon as possible.
	• Vegetation clearing should take place in a phased manner.
	• Access roads must be kept as narrow as possible and existing gravel access roads must be used where possible.
	• Limit the number of vehicles and trucks travelling to and from the proposed sites, where possible.
	• Ensure that dust suppression techniques are implemented:
	  ○ on all access roads;
	  ○ in all areas where vegetation clearing has taken place; and
	  ○ on all soil stockpiles.
	• Maintain a neat construction site by removing litter, rubble and waste materials regularly.
	• Formulation and adherence to an EMPr, monitored by an ECO.
	• In areas of 'Very High' and 'High Sensitivity', the number of turbines should be
		Moderate	**Moderate**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
	limited, where possible. • Steep slopes (>1:5 gradient) should be avoided.		
CUMULATIVE IMPACTS - OPERATIONAL ACTIVITIES			
Visual intrusion, dust emission and light pollution and glare. Combined visual impacts from several renewable energy facilities in the broader area during operation phase could potentially alter the sense of place and visual character of the area. Combined visual impacts from several renewable energy facilities in the broader area during the operations phase could potentially exacerbate visual impacts on visual receptors.	• Development on steep slopes (>1:5 gradient) should be avoided. • No turbines should be placed within 500 m of the dwellings or farmsteads which are situated within the proposed application (i.e. 500 m exclusion buffers – see Section 1.6.2 of the VIA and Figures D.9 and D.12) • Where possible, fewer but larger turbines with a greater output should be utilised rather than a larger number of smaller turbines with a lower capacity. • Turbine colours should adhere to SACAA requirements. • Where possible, fewer but larger turbines with a greater output should be utilised rather than a larger number of smaller turbines with a lower capacity. • If possible, turbines should be painted plain white, as this is a less industrial colour. Bright colours and logos on the turbines should be kept to a minimum. • Inoperative turbines should be repaired promptly, as they are considered more visually appealing when the blades are rotating (or at work) (Vissering, 2011). • If turbines need to be replaced for any reason, they should be replaced with the same model, or one of equal height and scale. Repeating elements of the same height, scale and form can give the impression of unity which will lessen the visual impact that would typically be experienced in a chaotic landscapes made up of diverse colours, textures and patterns (Vissering, 2011). • Light fittings for security at night should reflect the light toward the ground and prevent light spill. • Where practically possible, the O&M buildings should not be illuminated at night.	**Moderate**	**Moderate**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
	• Cables should be buried underground where feasible. • The O&M buildings should be painted with natural tones that fit with the surrounding environment. Non-reflective surfaces should be utilised where possible. • Unless there are water shortages, dust suppression techniques must be implemented on all access roads.		

D.2.5.5 Comparative assessment of alternatives

A comparative assessment of alternatives (Option 1 and Option 2) for the proposed BESS and on-site SS complex area was undertaken in order to determine which of the alternatives would be preferred from a visual perspective.

The BESS and on-site SS complex area Option 1 is situated within a highly natural / scenic part of the study area and as such it is expected to alter the character to some degree. It is located on relatively flat terrain and as such would only be moderately exposed on the skyline. The closest potentially sensitive receptor to this alternative is approximately 2.6 km away, this being the R02 farmstead. The significance of the visual impacts from Option 1 affecting this receptor are therefore rated as moderate. The remaining receptors are all more than 2 km away and thus would only be subjected to moderate or low levels of impact.

In addition, the proposed BESS and on-site SS complex would form part of the proposed Komas WEF and would be dwarfed by the large number of wind turbines that would be visible. Accordingly, no fatal flaws were identified in respect of Option 1. In light of the fact that Option 2 is closer to the nearest receptor, Option 1 is considered to be preferred from a visual perspective (while Option 2 was also found to be favourable). No fatal flaws were therefore identified for either of the alternatives.

D.2.5.6 Assessment of No-Go alternative

The 'No Go' alternative is essentially the option of not developing a WEF in this area. The area would thus retain its visual character and sense of place and there would be no visual impacts. However, considering the fact that the proposed Komas WEF is in the Springbok REDZ and development of other WEF is likely anyway, there are no flaws associated with proceeding with the proposed Komas WEF.

D.2.5.7 Concluding Statement

Overall, the sparse human habitation and the predominance of natural vegetation cover across much of the study area would give the viewer the general impression of a largely natural rural setting. As such, WEF development would alter the visual character and contrast significantly with the typical land use and/or pattern and form of human elements present across the broader in the study area.

The area is not however typically valued or utilised for its tourism significance and there is limited human habitation resulting in relatively few potentially sensitive receptors in the area. The proposed development will have a high level of impact on three (3) of these receptors, a medium level of impact on seven (7) identified receptors and negligible impact on the remaining three (3) receptors.

The assessment revealed that the proposed Komas WEF will have a negative low visual impact during construction and a negative moderate visual impact during operation, with relatively few mitigation measures available to reduce the visual impact.

Although several proposed renewable energy developments and infrastructure projects were identified within a 50 km radius of the proposed Komas WEF development site, it was determined that only five of these would have any significant impact on the landscape within the visual assessment zone. These are the proposed Gromis WEF which is currently being undertaken as part of a separate BA process and the proposed Kleinzee, Kap Vley, Namas and Zonnequa WEFs. All of these projects are in close proximity to one another and to the proposed Komas WEF development area. It is

anticipated that this concentration of facilities will alter the inherent sense of place and introduce an increasingly industrial character into a largely rural area. This will result in significant cumulative impacts, rated as negative moderate during both construction and operation phases of the project. It is however anticipated that these impacts could be mitigated to acceptable levels with the implementation of the recommendations and mitigation measures stipulated for each of these developments by the visual specialists. It should also be emphasised that the proposed Komas WEF will be located in the Springbok REDZ 8, i.e. an area which is earmarked for the development of WEFs.

It is SiVEST's opinion that the potential visual impacts associated with the proposed Komas WEF development and associated infrastructure during the operational phase are of moderate significance pre- and post-mitigation. Given the low level of human habitation and the absence of sensitive receptors however, the project is deemed acceptable from a visual and flicker perspective and the EA should be granted. SiVEST is of the opinion that the impacts associated with the construction, operation and decommissioning phases of the proposed Komas WEF can be mitigated to acceptable levels provided the recommended mitigation measures are implemented.

D.2.6 Heritage Impact Assessment (Archaeology and Cultural Landscape)

The HIA was undertaken by Dr. Jayson Orton of ASHA Consulting (Pty) Ltd to inform the outcome of this BA from an archaeology and cultural landscape perspective (Appendix C.6). The HIA was undertaken in accordance with Appendix 6 of the NEMA EIA Regulations, 2014, as amended. As noted above, an integrated HIA containing Archaeology, Cultural Landscape and Palaeontology has been undertaken for the project. The complete HIA is included in Appendix C.6 of this report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the HIA. The information below is extracted from Orton (2020) (Appendix C.6 of the BA Report).

D.2.6.1 Approach and Methodology

Literature survey and information sources

A survey of available literature was carried out to assess the general heritage context into which the development would be set. This literature included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS). The 1:50 000 and 1:250 000 topographic maps and the historical aerial images were sourced from the Chief Directorate: National Geo-Spatial Information. Data were also collected via a field survey.

Field survey

The site was subjected to a detailed foot survey on 6th, 7th, 10th and 11th January 2020. This was during summer but, in this very dry area, the season makes no meaningful difference to vegetation covering and hence the ground visibility for the archaeological survey. Other heritage resources are not affected by seasonality. During the survey the positions of finds and survey tracks were recorded on a hand-held GPS receiver set to the WGS84 datum. Photographs were taken at times in order to capture representative samples of both the affected heritage and the landscape setting of the proposed development.

It should be noted that the amount of time between the dates of the field inspection and final report do not materially affect the outcome of the study.

D.2.6.2 Relevant Project Aspects relating to Heritage Impacts

All aspects of the proposed development are relevant since excavations for foundations may impact on archaeological and/or palaeontological remains, while the above-ground aspects create potential visual (contextual) impacts to the cultural landscape and any significant heritage site that might be visually sensitive.

D.2.6.3 Potential Impacts

The potential impacts identified during the HIA include:

Construction Phase

- Potential impacts to palaeontological resources;
- Potential impacts to archaeological resources and graves; and
- Potential impacts to the cultural landscape.

The vast majority of impacts would occur during construction. Palaeontological resources are likely to consist of isolated bones and their locations cannot be predicted. Any fossils present could be of high significance and, if found and reported, impacts are expected to be of **low positive** significance after mitigation. This is because of the difficulty of finding fossils outside of the development context – their recovery would be a benefit to science. The region is well-known for its very high density of archaeological sites but their number and significance often decreases away from the coast. The survey revealed many small Later Stone Age archaeological sites with occasional historical artefacts also present. None of these was of high cultural significance and the WEF has avoided all known sites. Although it is possible that some sites were missed during the survey, these are likely to be less important ones and would be easily recorded during a pre-construction survey. Because of the ease with which mitigation can be effected, the impacts related to the loss of archaeological resources on site are expected to be of **very low negative** significance after mitigation. Although culturally important, graves are very unlikely to be impacted and their locations generally cannot be predicted. The impact significance is therefore expected to be **very low negative** before and after mitigation. Impacts to the cultural landscape cannot be mitigated because of the size of the turbines but the expected impacts would be of **moderate negative** significance. Impacts to the cultural landscape during the operation and decommissioning phases are respectively of low and moderate significance before and after mitigation.

Operational Phase

- Potential impacts to the cultural landscape.

Decommissioning Phase

- Potential impacts to the cultural landscape.

Cumulative impacts

- Potential impacts to palaeontological resources;

- Potential impacts to archaeological resources; and
- Potential impacts to the cultural landscape.

As indicated above, the vast majority of impacts would occur during construction. Cumulative impacts to archaeology are considered to be of moderate negative significance after mitigation, because there is the possibility that a large number of sites could be lost with extensive development of the area.

No indirect impacts are anticipated for the HIA.

D.2.6.4 Impact Assessment

The table below includes a summary of the assessment of the **potential direct heritage impacts** identified for the proposed Komas WEF and associated infrastructure for the construction, operational and decommissioning phases. It also includes a summary of the cumulative impacts. The full assessment is provided in the HIA (Appendix C.6 of the BA Report).

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
CONSTRUCTION PHASE: DIRECT IMPACTS			
Loss of palaeontological resources.	• Monitoring, inspection, sampling, curation as required.	**Low**	**Low (+)**
Loss of archaeological resources on site.	• Conduct a pre-construction survey, sampling and curation as required.	**Low**	**Very Low**
Loss of graves.	• Protect and report graves found during construction so that they can be rescued.	**Very Low**	**Very Low**
Impacts to the cultural landscape.	• Minimise the amount of land that gets disturbed and scarred.	**Moderate**	**Moderate**
OPERATIONAL PHASE: DIRECT IMPACT			
Impacts to the cultural landscape.	• None.	**Low**	**Low**
DECOMMISSIONING PHASE: DIRECT IMPACT			
Impacts to cultural landscape.	• Minimise the amount of land that gets disturbed and scarred.	**Moderate**	**Moderate**
CUMULATIVE IMPACTS			
Loss of palaeontological resources.	• Monitoring, inspection, sampling, curation as required.	**Low**	**Low (+)**
Loss of archaeological resources.	• Conduct a pre-construction survey, sampling and curation as required.	**Moderate**	**Very Low**
Loss of graves.	• Protect and report graves found during construction so that they can be rescued.	**Very Low**	**Very Low**
Impacts to the cultural landscape.	• Minimise the amount of land that gets disturbed and scarred.	**Moderate**	**Moderate**

D.2.6.5 Comparative assessment of alternatives

No heritage impacts are anticipated at either BESS and on-site SS complex area and the assessment undertaken thus apply equally to either the Option 1 or Option 2 alternative. There is no preference between Option 1 and Option 2, and therefore both alternatives are acceptable from a heritage perspective.

D.2.6.6 Assessment of No-Go alternative

The No-Go alternative would entail the site staying as it currently is. This means its continued use for small stock grazing and the continued natural erosion, weathering and trampling by animals. Palaeontological resources would not likely be affected because significant fossils will remain buried, but archaeological materials would suffer very minimal impacts. The landscape would remain unchanged. Overall, the significance of impacts related to the No-Go alternative is considered to be very low negative.

D.2.6.7 Concluding Statement

The main identified issues are the potential impacts to fossils, archaeological sites and the cultural landscape. Mitigation of the first two impacts can be easily effected and, in any case, fossils are not very likely to be found. The landscape can only be mitigated at the site-specific level with the broader impacts not able to be mitigated. This impact is not of high significance, especially given the project location within a REDZ. Table 7 in Section 5 of the HIA (Appendix C.6 of the BA Report) lists the heritage indicators and shows how they have been or will be responded to. None of them remain problematic. **There are no fatal flaws and the proposed Komas WEF development is acceptable from a heritage perspective, subject to the implementation of the recommended mitigation measures.**

D.2.7 Palaeontology Impact Assessment

The Palaeontology Impact Assessment was undertaken by John Pether, a Geological and Palaeontological Consultant, to inform the outcome of this BA from a palaeontological perspective. It was undertaken in accordance with Appendix 6 of the NEMA EIA Regulations, 2014, as amended. As noted above, an integrated HIA containing Archaeology, Cultural Landscape and Palaeontology has been undertaken for the project (Appendix C.6). However, for ease of reference, this section only deals with the Palaeontology assessment. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement of the Palaeontology Impact Assessment. A full assessment is provided in the Palaeontology Impact Assessment (Appendix 4 of the HIA).

D.2.7.1 Approach and Methodology

The relatively few fossils from the Namaqualand coastal plain have been vital to the current understanding of the coastal-plain geological history, not only of Namaqualand, but the fossil findings are also relevant to the coastal plains of the wider southern Africa. Deposits or formations are rated in terms of their potential to include fossils of scientific importance, viz. their palaeontological sensitivity. Palaeontological sensitivity refers to the likelihood of finding significant fossils within a geologic unit, which informs the Intensity/Magnitude/Severity rating in an impact assessment. The rating criteria are included in Appendix 3 of the Palaeontology Impact Assessment (Appendix 4 of the HIA).

D.2.7.2 Relevant Project Aspects relating to Palaeontological Impacts

All aspects of the proposed Komas WEF development are relevant since excavations for foundations may impact on palaeontological remains.

D.2.7.3 Potential Impacts

The potential impacts identified during the Palaeontology Impact Assessment include:

Construction Phase

- Direct destruction of fossil resources.

The primary palaeontological concern is the fossil bones that are sparsely distributed in these aeolian deposits. In the Hardevlei and Koekenaap formations the fossil bone and marine shell material that may occur is likely to be in an archaeological context. Both artefacts and fossil bones are most often found on the compact palaeosurface of the Dorbank Formation beneath the surficial sands. The fossil bone material would be of late Quaternary age and comprised mainly of extant species (modern fauna), but could include species that did not historically occur in the region.

The fossil bone finds in the Dorbank Formation are generally the scattered, disarticulated and sometimes fragmented larger limb bones of antelopes and zebra. Pans and vleis/seep deposits, with greater fossil potential, may occur along buried drainage lines within the Dorbank Formation. Most finds have been at lower elevations in diamond-mine pits and little is known of this formation and its fossils at higher elevations and in this region of the coastal plain. Fossil finds could prove to be a scientifically significant addition to the poorly-known later mid-Quaternary fossil fauna of Namaqualand.

Due to the overall sparse distribution of fossil bones in the affected formations the palaeontological sensitivity and intensity of impact is considered to be LOW before and after mitigation for all excavations involved in the construction of the proposed Komas WEF and associated infrastructure. However, when fossils are found in such poorly fossiliferous formations, they provide very significant advances in the geological understanding of the stratigraphy of a region.

There will be a considerable number of excavations for turbine foundations (i.e. 50) distributed over and “sampling” a wide area during the construction phase. Therefore, in spite of the overall low fossil potential, there is a distinct possibility that buried palaeosurfaces bearing fossil bones and archaeological material may be exposed in some of the excavations. The excavations for cabling and other infrastructure such as the SS are relatively shallow and mainly affect the coversands, but the cabling trenches will traverse considerable lengths across the proposed WEFs development areas and intersect the locally-fossiliferous top of the Dorbank Unit in places.

Cumulative impacts

- Direct destruction of fossil resources.

Several other WEFs have been proposed in the area. Although this may mean that more impacts to palaeontology are anticipated, there is also the likelihood that there will be a gain in terms of the state of knowledge of these disciplines if mitigation measures are successfully applied. The significance of impacts is expected to be the same as that for the construction phase with a low negative and low positive impact to palaeontology.

D.2.7.4 Impact Assessment

The table below includes an assessment of the potential **direct impacts to Palaeontology resources** identified for the proposed Komas WEF and associated infrastructure for the construction phase and the cumulative impact. The full assessment is provided in the Palaeontological Impact Assessment (Appendix 4 to the HIA included as Appendix C.6 of the BA Report).

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
CONSTRUCTION PHASE: DIRECT IMPACTS			
Direct destruction of fossil resources.	• Monitoring of all construction-phase excavations by project staff and ECO. • Significant fossil chance finds should be safeguarded and reported at the earliest opportunity to SAHRA for recording and sampling by a professional palaeontologist. A protocol for Chance Fossil Finds is appended as Appendix 4 of the Palaeontology Impact Assessment. • These recommendations must be included within the EMPrs for the proposed Komas WEF development. • Inspection, sampling and recording of selected exposures in the event of fossil finds. • Fossil finds and the compiled contextual report deposited in a curatorial scientific institution.	**Low**	**Low (+)**
CUMULATIVE IMPACTS			
Disturbance, damage or destruction of significant fraction of fossil heritage within the lower Abrahamskraal Formation (Karoo Supergroup).	• Monitoring of all construction-phase excavations by project staff and ECO. • Significant fossil chance finds should be safeguarded and reported at the earliest opportunity to SAHRA for recording and sampling by a professional palaeontologist. A protocol for Chance Fossil Finds is appended as Appendix 4 of the Palaeontology Impact Assessment.	**Low**	**Low (+)**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
	These recommendations must be included within the EMPrs for the proposed Komas WEF development. • Inspection, sampling and recording of selected exposures in the event of fossil finds. • Fossil finds and the compiled contextual report deposited in a curatorial scientific institution.		

D.2.7.5 Comparative assessment of alternatives

Due to the low palaeontological sensitivity of the site, there is no material difference between the palaeontological impact of the BESS and on-site SS complex area alternative (Option 1 or Option 2) and therefore both these alternatives are considered acceptable from a palaeontological perspective.

D.2.7.6 Assessment of No-Go alternative

The No-Go alternative would entail the site staying as it currently is. This means its continued use for small stock grazing and the continued natural erosion, weathering and trampling by animals. Palaeontological resources would not likely be affected because significant fossils will remain buried. Overall, the significance of impacts related to the No-Go alternative is considered to be very low negative.

D.2.7.7 Concluding Statement

Potential adjustments to the layout of the turbines and infrastructure do not affect this assessment.

If the recommended mitigation measures are applied to the proposed Komas WEF, it is possible that the WEF development will to some extent alleviate the negative cumulative impact on paleontological resources in the region.

The history of these vast tracts of sands, gravels and pedocretes of the Northern Cape Province is very poorly known, with very few fossils to rely on. Therefore, although of low probability; any find will be of considerable importance and could add to the scientific knowledge of the area in a positive manner.

The significance of potential impacts to palaeontological resources was assessed to be **low negative before and low positive after mitigation** during the construction phase of the proposed Komas WEF and associated infrastructure. **It is therefore the opinion of the specialist that development of the proposed Komas WEF and associated infrastructure is considered acceptable from a palaeontological perspective and can be authorised, subject to the implementation of the recommended mitigation measures.**

D.2.8 Agriculture

An Agriculture Compliance Statement was undertaken by Johann Lanz to inform the outcome of this BA from an agricultural and soils perspective. The complete Agriculture Compliance Statement is included in Appendix C.7 of this report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Agriculture Compliance Statement. The information below is extracted from the Agriculture Compliance Statement (Appendix C.7 of the BA Report).

D.2.8.1 Approach and Methodology

An Agricultural Compliance Statement was required and undertaken in terms of the requirements of the *Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources by onshore wind and/or solar photovoltaic energy generation facility where the electricity output is 20 megawatts or more*, gazetted on 20 March 2020 in GN 320 (in terms

of Sections 24(5)(A) and (H) and 44 of NEMA, 1998). As per the requirement of the Protocol in GN 320, the assessment was based on a desktop analysis of existing soil and agricultural potential data for the site. Various information and desktop sources of information were used. The Compliance Statement was also informed by a site visit which was undertaken by the EAP, Minnelise Levendal, on 29 September 2020.

D.2.8.2 Relevant Project Aspects relating to Agricultural Impacts

For agricultural impacts, the exact nature of the different infrastructure within a development has very little bearing on the significance of impacts. What is of most relevance is simply the occupation of the land, and whether it is being occupied by a turbine foundation, a hardstand, a building or a SS makes no difference. What is of most relevance therefore is simply the total footprint of the proposed facility.

The components of the proposed project that can impact on soils, agricultural resources and productivity are:

1) Occupation of the land by the total, direct, physical footprint of the proposed project including all roads; and
2) Construction (and decommissioning) activities that may disturb the soil profile and vegetation, for example for levelling, excavations, etc.

D.2.8.3 Potential Impacts

Two potential negative agricultural impacts have been identified. These impacts are described below and apply to the Komas WEF, and other associated infrastructure:

- Loss of agricultural land use - Agricultural grazing land directly occupied by the development infrastructure, which includes all associated infrastructure, will become unavailable for agricultural use; and
- Soil degradation - Soil degradation can result from erosion, topsoil loss and contamination. Erosion can occur as a result of the alteration of the land surface run-off characteristics, which can be caused by construction related land surface disturbance, vegetation removal, and the establishment of hard surface areas including roads. Loss of topsoil can result from poor topsoil management during construction related excavations. Hydrocarbon spillages from construction activities can contaminate soil. Soil degradation will reduce the ability of the soil to support vegetation growth.

The potential cumulative agricultural impact of importance is a regional loss or degradation of agricultural land. There are thirteen other proposed renewable energy facilities within 50 km of the proposed Komas WEF site (as indicated in Table D.1 and Figure D.1) which have been included in the consideration of cumulative impact. All of these projects have the same agricultural impacts in an almost identical agricultural environment, and therefore the same mitigation measures apply to all. The cumulative impact is affecting an agricultural environment that has been declared a REDZ, i.e. the Springbok REDZ (REDZ 8) precisely because it is an environment that can accommodate numerous renewable energy developments without exceeding acceptable levels of agricultural land loss. This is primarily because of the low agricultural capability of land across the Springbok REDZ, and the fact that such land is not a scarce resource in South Africa.

In quantifying the cumulative impact, the area of land taken out of grazing as a result of all eleven developments plus the 300 MW of this development (total generation capacity of 1 797.7 MW) will amount to a total of approximately 726.31 hectares. This is calculated using the industry standards of

2.5 and 0.3 hectares per megawatt for solar and wind energy generation respectively, as per the Department of Environmental Affairs (DEA) Phase 1 Wind and Solar Strategic Environmental Assessment (SEA) (2015). As a proportion of the total area within a 50 km radius (approximately 785 000 ha), this amounts to 0.09% of the surface area. That is well within an acceptable limit in terms of loss of low potential agricultural land, of which there is no scarcity in the country. This is particularly so when considered within the context of the following point:

- In order for South Africa to achieve its renewable energy generation goals, agriculturally zoned land will need to be used for renewable energy generation. It is far more preferable to incur a cumulative loss of agricultural land in a region such as the one being assessed, which has no cultivation potential, and low grazing capacity, than to lose agricultural land that has a higher potential, and that is much scarcer, to renewable energy development elsewhere in the country. The limits of acceptable agricultural land loss are far higher in this region than in regions with higher agricultural potential.

Because of the negligible agricultural impacts of EGI, the agricultural environment can accommodate far more EGI than currently exists, or is currently proposed, before acceptable levels of change are exceeded.

It should also be noted that there are few land uses, other than renewable energy, that are competing for agricultural land use in this area. The cumulative impact from developments, other than renewable energy, is therefore likely to be low.

Due to all of the considerations discussed above, the cumulative impact of loss of agricultural land use will not have an unacceptable negative impact on the agricultural production capability of the area. The proposed development is therefore acceptable in terms of cumulative impact, and it is therefore recommended that it is approved.

D.2.8.4 Assessment

An Agricultural Compliance Statement is not required to formally rate agricultural impacts. It is only required to indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site. It must provide a substantiated statement on the acceptability, or not, of the proposed development and a recommendation on the approval, or not of the proposed development. However, an assessment of agricultural impacts has been provided by the specialist. The table below includes a summary of the assessment of the potential direct agricultural impacts identified for the Komas WEF and associated infrastructure for the construction, operational and decommissioning phases. It also includes a summary of the cumulative impacts. The full assessment is provided in the Agriculture Compliance Statement (Appendix C.7 of the BA Report).

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
CONSTRUCTION PHASE: DIRECT IMPACTS			
Loss of agricultural land use.	• None.	**Low**	**Low**
Soil degradation.	• Storm water run-off control. • Maintain vegetation cover. • Strip, stockpile and re-spread topsoil.	**Low**	**Low**
OPERATIONAL PHASE: DIRECT IMPACTS			
Increased financial security for farming operations.	• None	**Low (+)**	**Low (+)**
DECOMMISSIONING PHASE: DIRECT IMPACTS			
Soil degradation.	• Storm water run-off control. • Maintain vegetation cover. • Strip, stockpile and re-spread topsoil.	**Low**	**Low**
CUMULATIVE IMPACT			
Regional loss and agricultural land use.	• None	**Very low**	**Very low**

D.2.8.5 Comparative Assessment of alternatives

Because of the agricultural uniformity and low potential, there is no material difference between the agricultural impact of the BESS and on-site SS complex area alternatives, i.e. Option 1 or Option 2, and therefore both these alternatives are considered acceptable from an agricultural perspective.

D.2.8.6 Assessment of No-go Alternative

The No-Go alternative considers impacts that will occur to the agricultural environment in the absence of the proposed Komas WEF development. The one identified potential such impact is that due to continued low rainfall in the area, in addition to other economic and market pressures on farming, the agricultural enterprises will come under increased pressure in terms of economic viability, with resultant potential decrease in productivity.

The proposed development has both positive and negative agricultural impacts.

The balance of positive and negative agricultural impacts associated with both the development of the proposed Komas WEF and the No-Go alternative – that is the extent to which the development and the No-Go alternative will impact agricultural production – cannot reliably be determined to be significantly different. Therefore, from an agricultural impact perspective, there is no preferred alternative between the development and the No-Go.

The agricultural impact of the proposed development can confidently be assessed as negligible without entering into a more formal assessment.

D.2.8.7 Concluding Statement

The conclusion of this assessment is that the proposed Komas WEF development will not have an unacceptable negative impact on the agricultural production capability of the site. The proposed development is therefore acceptable. This is substantiated by the following points:

- The amount of agricultural land loss is within the allowable development limits prescribed by the agricultural protocol. These limits reflect the national need to conserve valuable agricultural land and therefore to steer, particularly renewable energy developments, onto land with low agricultural production potential.
- The proposed development poses a low risk in terms of causing soil degradation, which can be adequately and fairly easily managed by mitigation management actions. In addition, the degradation risk is only to land of low agricultural value, and the significance of the impact is therefore low.
- The outcome of the site sensitivity verification and assessment therefore confirms the current use of the land as agriculture and the environmental sensitivity as low, as identified by the National Web-Based Screening Tool. Therefore, a Compliance Statement was undertaken in accordance with the requirements of the Agricultural Protocol for Onshore Wind and/or Solar PV Energy Generation Facilities where the Electricity Output is 20 MW or more (GG 43110 / GNR 320, 20 March 2020).
- The overall significance of the potential impact on agricultural resources for the construction, operation and decommissioning phases is assessed as low to very low (with mitigation actions applied effectively).

Therefore, from an agricultural impact point of view, it is recommended that the proposed development be approved.

D.2.9 Socio-Economic Impact Assessment

The Socio-Economic Impact Assessment was undertaken by Tony Barbour and Schalk van der Merwe of Tony Barbour Environmental Consulting to inform the outcome of this BA from a socio-economic perspective. The Socio-Economic Impact Assessment was undertaken in accordance with Appendix 6 of the NEMA EIA Regulations, 2014, as amended. The complete Socio-Economic Assessment is included in Appendix C.8 of this BA Report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Socio-Economic Assessment. The information below is extracted from the Socio-Economic Assessment (Appendix C.8 of the BA Report).

D.2.9.1 Approach and Methodology

The approach to the study is based on the Western Cape DEA&DP's Guidelines for Social Impact Assessment (SIA) (February 2007). These guidelines are based on international best practice. The key activities undertaken as part of the Socio-Economic Assessment process as embodied in the guidelines include:

5. Describing and obtaining an understanding of the proposed intervention (type, scale, and location), the settlements, and communities likely to be affected by the proposed project;
6. Collecting baseline data on the current social and economic environment;
7. Identifying the key potential social issues associated with the proposed project;
8. Site visit and semi-structured interviews with key stakeholders and affected individuals and communities;
9. Assessing and documenting the significance of social impacts associated with the proposed intervention; and
10. Consideration of other renewable energy projects that may pose cumulative impacts; and
11. Identification of enhancement and mitigation measures aimed at maximizing opportunities and avoiding and or reducing negative impacts.

The identification of potential social issues associated with the proposed Komas WEF is based on observations during the project site visit, review of relevant documentation, experience with similar projects and the general area. Annexure C of the Socio-Economic Impact Assessment (Appendix C.8) contains a list of the secondary information reviewed and interviews conducted.

A site visit was undertaken by Mr van der Merwe from 4-6 March 2020, when some of the interviews were conducted. The other interviews were conducted telephonically.

D.2.9.2 Relevant Project Aspects relating to Socio-Economic Impacts

From a socio-economic perspective, the most important project related aspects are employment creation over the lifetime of the project; and the development of the Socio-Economic Development (SED) Plan for implementation by the Project Applicant. This is relevant should the proposed Komas WEF project obtain preferred bidder status in terms of the REIPPPP. In this regard IPPs are required to contribute a percentage of projected revenues accrued over the 20-year project operational life toward SED initiatives. These contributions accrue over the 20-year project operation life and are used to invest in housing and infrastructure as well as healthcare, education and skills development.

D.2.9.3 Potential Impacts

The potential impacts identified for the Socio-Economic Impact Assessment for the proposed Komas WEF project include the following:

Construction Phase:

Positive impact:

- Creation of employment and business opportunities, and opportunity for skills development and on-site training.

The construction phase for a single 300 MW WEF is expected to extend over a period of approximately 24 months and create approximately ~ 200-250 employment opportunities. It is anticipated that approximately 55% (136) of the employment opportunities will be available to low skilled workers, 30% (76) to semi-skilled workers and 15% (38) for skilled personnel. The majority of low and semi-skilled employment opportunities will be available to Historically Disadvantaged (HD) members from the NKLM community. Due to the demise of the mining sector, the levels of unemployment in the NKLM are high. The towns that are likely to benefit are Komaggas, Buffelsrivier, Kleinsee, and Springbok. This would represent a significant positive social benefit in an area with limited employment opportunities. In order to maximise the potential benefits, the developer should commit to employing local community members to fill the low and medium skilled jobs.

The potential benefits for local communities are confirmed by the findings of the Overview of the IPPPP undertaken by the Department of Energy, National Treasury and the Development Bank of South Africa (DBSA) (March 2019). The review found that by the end of March 2019 the 64 renewable energy projects that had been successfully completed had created 31 633 job years of employment, compared to the anticipated 20 689. This was 53% more than planned.

The study also found that significantly more people from local communities were employed during construction than was initially planned.

The capital expenditure associated with the construction phase for a 300 MW WEF will be in the region of R 2.5 billion (2020 Rand value). The total wage bill will be in the region of R69 million (2020 Rand value). A percentage of the wage bill will be spent in the local economy which will create opportunities for local businesses in the town in the area, such as Komaggas, Buffelsrivier, Kleinsee, and Springbok. The sector of the local economy that is most likely to benefit from the proposed development is the local service industry. The potential opportunities for the local service sector would be linked to accommodation, catering, cleaning, transport and security, etc. associated with the construction workers on the site. The benefits to the local economy will be confined to the construction period (approximately 24 months).

Negative impacts:

- Impacts associated with the presence of construction workers on local communities;
- Impacts related to the potential influx of job-seekers;
- Increased risks to livestock and farming infrastructure associated with the construction related activities and presence of construction workers on the site;
- Increased risk of grass fires associated with construction related activities;
- Noise, dust, waste and safety impacts of construction related activities and vehicles; and
- Impacts on productive farmland due to construction activities.

Impacts associated with the presence of construction workers on local communities

Experience has shown that the presence of construction workers can pose a potential risk to family structures and social networks. These risks however tend to be more pronounced in isolated rural areas. While the presence of construction workers does not in itself constitute a social impact, the manner in which construction workers conduct themselves can impact on local communities. The most significant negative impact is associated with the disruption of existing family structures and social networks. The risks are linked to:

- An increase in alcohol and drug use;
- An increase in crime levels;
- The loss of girlfriends and/or wives to construction workers;
- An increase in teenage and unwanted pregnancies;
- An increase in prostitution; and
- An increase in sexually transmitted diseases (STDs), including HIV.

However, while the risk does exist, the majority of the low skilled (136) and semi-skilled (76) work opportunities associated with the construction phase are likely to benefit members from the local community. If these opportunities are taken up by local residents the potential impact on the local family and social network will be low as these workers come from local community. As indicated in the Overview of the IPPPP (March 2019), in terms of benefits for local communities, significantly more people from local communities were employed during construction than was initially planned. The expectation for local community participation was 13 058 job years. To date 18 253 job years have been realised (i.e. 140% more than initially planned), with 26 projects still in construction. The likelihood of local community members being employed during the construction phase is therefore high.

Employing members from the local community to fill the low-skilled job categories will reduce the risk and mitigate the potential impact on the local communities. The use of local residents to fill the low skilled job categories will also reduce the need to provide accommodation for construction workers in local towns in the area, such as Komaggas, Buffelsrivier, Kleinsee and Springbok. The non-local skilled workers (38) are likely to be accommodated in local guest facilities in the area, such as Die Houthoop Guest Farm. The presence of an additional 38 or so workers over a period of 24 months is unlikely to have a significant impact on local family networks and structures in the area.

In terms of potential threat to the families of local farm workers in the vicinity of the site, the risk is likely to be low. This is due to the low number of permanent and temporary farm workers on local farms in the area. The potential risk is therefore likely to be limited. The risks can also be effectively mitigated by ensuring that the movement of construction workers on and off the site is carefully controlled and managed. However, given the nature of construction projects it is not possible to totally avoid these potential impacts at an individual or family level.

While the risks associated with construction workers at a community level will be low, at an individual and family level they may be significant, especially in the case of contracting a sexually transmitted disease or an unplanned pregnancy. This potential risk should also be viewed within the context of the socio-economic benefits associated with the creation of employment opportunities for locals.

Impacts related to the potential influx of job-seekers

Large construction projects tend to attract people to the area in the hope that they will secure a job, even if it is a temporary job. These job seekers can in turn become “economically stranded” in the

area or decide to stay on irrespective of finding a job or not. As in the case of construction workers employed on the project, the actual presence of job seekers in the area does not in itself constitute a social impact. However, the manner in which they conduct themselves can impact on the local community.

Experience from other projects has also shown that the families of job seekers may accompany individual job seekers or follow them at a later date. In many cases the families of the job seekers that become "economically stranded" and the construction workers that decided to stay in the area, subsequently moved to the area. The influx of job seekers to the area and their families can also place pressure on the existing services in the area, specifically low-income housing. In addition to the pressure on local services the influx of construction workers and job seekers can also result in competition for scarce employment opportunities. Further secondary impacts included increase in crime levels, especially property crime, as a result of the increased number of unemployed people. These impacts can result in increased tensions and conflicts between local residents and job seekers from outside the area.

These issues are similar to the concerns associated with the presence of construction workers and are discussed above. However, in some instances the potential impact on the community may be greater given that they are unlikely to have accommodation and may decide to stay on in the area. In addition, they will not have a reliable source of income. The risk of crime associated with the influx of job seekers may therefore be greater.

However, the potential for economically motivated in-migration and subsequent labour stranding in the area linked to the proposed project is likely to be low. This is due to the location of the site, the relatively small size of the project (300 MW), the limited employment opportunities (~250) and short duration of the construction phase (approximately 24 months). There are limited economic opportunities in area, specifically Komaggas, Buffelsrivier, Kleinsee and Springbok. The risks associated with job seekers being attracted to and staying on in the area will therefore be low.

Increased risk of grass fires associated with construction related activities

The presence of construction workers and construction-related activities on the site poses an increased fire risk, which could, in turn, pose a threat grazing and livestock. Due to the climate and sparseness of vegetation, the study area is not considered veld fire prone. However, all the farming operations depend on grazing and any fires would have the potential to have a significant impact on the already stressed farming operations. The potential fire risk of grass fires is highest towards the end of the dry summer months (November-March). This period also coincides with dry, windy conditions in the area.

Noise, dust, waste and safety impacts of construction related activities and vehicles

The movement of heavy construction vehicles during the construction phase has the potential to damage local farm roads and create dust and safety impacts for other road users in the area and also impact on farming activities.

At this stage it is unclear which road(s) will be affected by the construction traffic. Local roads currently mainly carry local traffic and traffic volumes are low and there are no significant seasonal variations. Some farms, e.g. Rooivlei, Sonnekwa and Graafwater are only accessible via single access roads (viz the one linking the R355 to the Komaggas road). Interviewees indicated that the project would potentially lead to the improvement of local roads, which would remain as a post-

construction benefit. The manager of Kleinsee Tourism also has indicated that the project also had the potential to improve access roads to Kleinsee (from e.g. Port Nolloth) which would benefit tourism in Kleinsee (de Vries – pers. comm).

In terms of the movement of construction traffic on the site, all the affected landowners indicated that the movement should be strictly limited to the relevant access road(s) and construction site. Off-road vehicle movement poses a significant risk to fragile vegetation, which, once damaged, may take a decade or more to recover. All the farmers interviewed also emphasized the need to keep farm gates closed and adherence to suitable speed limits, as failure to do so would endanger livestock on their properties. One interviewee proposed fencing in portions of road located across site-adjacent land to limit the risk of trespassing (Mostert – pers. comm).

The project components are likely to be transported to the site via the N7, which is an important tourist route between Namibia and the Cape. The transport of components to the site therefore has the potential to impact on other road users travelling along the N7, including tourists. Measures will need to be taken to ensure that the potential impact on motorist using the N7 is minimised. The potential impacts on tourists and locals can be effectively mitigated by restricting construction traffic movements to weekdays, and, where possible, limiting activities during over holiday periods, specifically Christmas and Easter holiday periods and other long weekends. The movement of heavy construction vehicles will also damage internal farm roads and other unsurfaced public roads that may be used to access the site. The damage will need to be repaired after the completion of the construction phase.

Experience from other projects also indicates that the transportation of construction workers to and from the site can result in the generation of waste along the route (packaging and bottles etc. thrown out of windows etc.)

Impacts on productive farmland due to construction activities.

Activities such as the establishment of access roads, the movement of heavy vehicles, the establishment of lay-down areas and foundations for the wind turbines, as well as the establishment of a SS and power lines will potentially damage topsoil and vegetation. As indicated above, all the affected landowners indicated that the movement should be strictly limited to the relevant access road(s) and construction site. Off-road vehicle movement poses a significant risk to fragile vegetation, which, once damaged, may take a decade or more to recover. The construction footprint should be minimised to mitigate the damage to the natural veld and disturbed areas should be rehabilitated upon completion of the construction phase.

Operational Phase:

Positive impacts:

- Establishment of renewable energy infrastructure;
- Creation of employment and business opportunities. The operational phase will also create opportunities for skills development and training;
- Benefits associated with the establishment of a Community Trust; and
- Benefits for affected landowners through the generation of income.

Development of renewable energy infrastructure

The establishment of renewable energy infrastructure, such as the proposed WEF, should be viewed, firstly within the context of the South Africa's current reliance on coal powered energy to meet the majority of its energy needs, and secondly, within the context of the success of the REIPPPP.

The Green Jobs study (2011) notes that South Africa has one of the most carbon-intensive economies in the world, thus making the greening of the electricity mix a national imperative. The Greenpeace Report (Powering the future: Renewable Energy Roll-out in South Africa, 2013), notes that within a broader context of climate change, coal energy does not only have environmental impacts, it also has socio-economic impacts. Acid mine drainage from abandoned mines in South Africa impacts on water quality and poses the biggest threat to the country's limited water resources. Huge volumes of water are also required to wash coal and cool operating power stations.

The Green Jobs study (2011) identifies a number of advantages associated with wind power as a source of renewable energy, including zero CO_2 emissions during generation and low lifecycle emissions. GHG associated with the construction phase are offset within a very short period of time compared with the project's lifespan. Wind power therefore provides an ideal means for reaching emission reduction targets in a relatively easy manner. In addition, and of specific relevance to South Africa, wind as energy source is not dependent on water (as compared to the massive water requirements of conventional power stations), has a limited footprint and therefore does not impact on large tracts of land, poses limited pollution and health risks, specifically when compared to coal and nuclear energy plants.

The National Climate Change Response White Paper outlines the national response to the impacts of climate change, as well as the domestic contribution to international efforts to mitigate green-house gas emissions. As part of the global commitment, South Africa is targeting an emissions trajectory that peaks at 34% below a "business as usual" case in 2020, 42% below in 2025 and from 2035 declines in absolute terms. The emission reductions between March 2018 and 2019 are estimated to be 10.9 million tonnes of CO_2. This represents 53% of the total projected annual emission reductions achieved with only partial operation to date. Since operation, the IPPs have generated 35 699 GWh, resulting in 36.2 Mton of CO_2 emissions being offset and saving 42.8 million kilolitres of water related to fossil fuel power generation.

The REIPPPP had therefore contributed significantly towards meeting South Africa's GHG emission targets and, at the same time, supporting energy security, economic stability and environmental sustainability.

The establishment of renewable energy facilities, such as the proposed WEF, therefore not only address the environmental issues associated with climate change and consumption of scarce water resources, but also creates significant socio-economic opportunities and benefits, specifically for historically disadvantaged, rural communities.

Creation of employment and business opportunities

The total number of permanent employment opportunities associated with a 300 MW WEF would be ~ 20. Of this total ~ 12 are low skilled workers, 6 semi-skilled and 2 skilled. The annual wage bill for the operational phase will be ~ R 3 million (2020 Rand value). The majority of low and semi-skilled beneficiaries are likely to be HD members of the community. Given the location of the proposed facility the majority of permanent staff is likely to reside in the local towns in the area, such as Komaggas, Buffelsrivier, Kleinsee and Springbok.

Procurement during the operational phase will also create opportunities for the local economy and businesses. In this regard the overview of the IPPPP (March 2019) notes that the operational phase procurement spend over the 20 year for Bidding Window (BW1 to BW4), 1S2 and 2S2 will be in the region of R 73.1 billion. The Green Jobs study (2011) also found that energy generation is expected to become an increasingly important contributor to green job creation over time, as projects are constructed or commissioned. The study notes that largest gains are likely to be associated with O&M activities. In this regard, O&M employment linked to renewable energy generation plants will also be substantial in the longer term.

Establishment of a Community Trust

The establishment of a community benefit structure (typically, a Community Trust) also creates an opportunity to support local economic development in the area. The requirement for the project to allocate funds to socio-economic contributions (through structures such as Community Trusts) provides an opportunity to advance local community projects, which is guaranteed for a 20-year period (project lifespan). The revenue from the proposed Komas WEF can be used to support a number of social and economic initiatives in the area, including but not limited to:

- Creation of jobs;
- Education;
- Support for and provision of basic services;
- School feeding schemes;
- Training and skills development; and
- Support for SMME's.

The 2019 IPPP Overview notes that the SED contributions associated with the 64 IPPs has to date has amounted to R 860.1 million. The province with the highest SED contribution has been the Northern Cape Province, followed by the Eastern Cape and Western Cape.

Enterprise development contributions committed for BW1 to BW4, 1S2 and 2S2 amount to R7.2 billion. Of the total commitment, R5.6 billion is specifically committed directly within the local communities where the IPPs operate, contributing significantly to local enterprise development. Up until the end of March 2019 a total of R 254.3 million had already been made to the local communities located in the vicinity of the 64 operating IPPs.

The Green Jobs study (2011), found that the case for wind power is enhanced by the positive effect on rural or regional development. Wind farms located in rural areas create an opportunity to benefit the local and regional economy through the creation of jobs and tax revenues. In this regard the towns of Komaggas, Buffelsrivier, Kleinsee and Springbok are small rural towns.

The long-term duration of the contributions from the WEF also enables local municipalities and communities to undertake long term planning for the area. Experience has, however, shown that Community Trusts can be mismanaged. This issue will need to be addressed in order to maximise the potential benefits associated with the establishment of a Community Trust or other community benefit structure (entity). The REIPPP programme does however have stringent audit requirements in place to try and prevent the mismanagement of trusts.

Benefits to landowners

The income from the WEFs reduces the risks to the livelihoods of the affected landowners posed by droughts and fluctuating market prices for sheep and farming inputs, such as fuel, feed etc. The

additional income from the WEF would improve economic security of farming operations, which in turn would improve job security of farm workers and benefit the local economy.

Negative impacts:

- The visual impacts and associated impact on sense of place and rural character of the landscape;
- Impact on property values and operations; and
- Impact on tourism.

Visual impacts and impact on sense of place

The potential visual impact on the areas sense of place and rural character was not raised as a concern by local landowners and tourism representatives interviewed. The is also located within the Springbok REDZ (REDZ 8). The area has therefore been identified as suitable for the establishment of renewable energy facilities, including WEFs. In addition, the local farmers, tourism officials and the Komaggas ward councillor indicated that the Kleinsee-Komaggas-Koingnaas area is well suited to the establishment of WEFs. This is linked to the sparse settlement pattern, low productive grazing value of the land, the relative absence of sensitive social and tourism receptors, and the fact that the WEFs would be able to provide economic opportunities for the local communities impacted by the closure of mining activities in the area. Due to the low water requirements WEFs were also regarded as sustainable in an arid area that is vulnerable to severe droughts. As such it is generally perceived as a potential stable source of income to buffer local farmers against droughts, and thus increase the viability and resilience of local farming. Based on the findings of the Socio-Economic Impact Assessment the significance is rated as Low Negative following mitigation.

Impact on property values and operations

A literature review was undertaken as part of the assessment (see section 4.4.6 for the literature review on the potential impact on property values. Based on the findings of the literature review the potential impact of WEFs on rural property values is likely to be low. This was confirmed by the feedback from the local landowners interviewed, none of whom raised concerns about the potential impact on property values.

Impact on tourism

A literature review was undertaken as part of the assessment. Based on the findings of the literature review there is limited evidence to suggest that the proposed Komas WEF would impact on the tourism in the NKLM and NDM at a local and regional level. The findings also indicate that WEFs do not impact on tourist routes. As noted above, the manager of Kleinsee Tourism also indicated that potential for improving the access roads to Kleinsee (from e.g. Port Nolloth) associated with the proposed Komas WEF had the potential to significantly benefit Kleinsee tourism (de Vries – pers. comm).

Decommissioning Phase:

- Social impacts associated with retrenchment including loss of jobs and source of income.

In the case of decommissioning ~ 20 permanent jobs associated with the operational phase would be lost. The potential impacts associated with the decommissioning phase can however be effectively managed with the implementation of a retrenchment and downscaling programme. With mitigation, the impacts are assessed to be Low Negative. The proponent should also investigate the option of establishing an Environmental Rehabilitation Fund to cover the costs of decommissioning and

rehabilitation of disturbed areas. The Fund should be funded by a percentage of the revenue generated from the sale of energy to the national grid over the 20-25-year operational life of the facility. The rationale for the establishment of a Rehabilitation Trust Fund is linked to the experiences with the mining sector in South Africa and failure of many mining companies to allocate sufficient funds during the operational phase to cover the costs of rehabilitation and closure. Alternatively, the funds from the sale of the WEF components and associated infrastructure as scrap metal should be allocated to the rehabilitation of the site.

Cumulative Impacts:

- Impact on sense of place and the landscape;
- Impact on local services and accommodation; and
- Impact on local economy.

Cumulative impact on sense of place

Based on the findings of the Socio-Economic Impact Assessment the potential visual impact on the areas' sense of place and rural character was not raised as a concern by local landowners and tourism representatives interviewed. The site is also located within the Springbok REDZ (REDZ 8). The area has therefore been identified as suitable for the establishment of REFs, including WEFs. The significance of the potential cumulative impact on the areas character and sense of place is therefore regarded as **Low Negative**.

The findings of the VIA rate the significance of the cumulative impact on the areas sense of place as **Moderate Negative**. The VIA notes however that these impacts could be mitigated to acceptable levels with the implementation of the recommendations and mitigation measures stipulated for each of these developments by the visual specialists.

However, the potential impact of WEFs on the landscape is an issue that does need to be considered, specifically given South African's strong attachment to the land and the growing number of WEF applications. The Environmental Authorities should therefore be aware of the potential cumulative impacts when evaluating applications and the potential implications for other land uses, specifically game farming and associated tourist activities.

Cumulative impact on services

The establishment of the proposed Komas WEF and the other REFs in the NKLM and NDM may place pressure on local services, specifically medical, education and accommodation. This pressure will be associated with the potential influx of workers to the area associated with the construction and operational phases of renewable energy projects proposed in the area, including the proposed Komas WEF. The potential impact on local services can be mitigated by employing local community members. With effective mitigation the significance of the impact is rated as **Low Negative.**

In addition, as indicated below, this impact should also be viewed within the context of the potential positive cumulative impacts for the local economy associated with the establishment of renewable energy as an economic driver in the area.

Cumulative impact on local economies

In addition to the potential negative impacts, the establishment of the proposed Komas WEF and other REFs in the area also has the potential to create a number of socio-economic opportunities for

the NKLM and NDM, which, in turn, will result in a positive social benefit. The positive cumulative impacts include creation of employment, skills development and training opportunities, creation of downstream business opportunities. The Community Trusts associated with each project will also create significant socio-economic benefits. These benefits should also be viewed within the context of the limited economic opportunities in the area and the impact of the decline in the mining sector in recent years. This significance of this benefit is rated as **High Positive** with enhancement.

Indirect cumulative impacts were identified.

D.2.9.4 Impact Assessment

The table below includes an assessment of the potential direct socio-economic impacts identified for the proposed Komas WEF and associated infrastructure for the construction, operational and decommissioning phases. It also includes an assessment of the potential cumulative impacts. The full assessment is included in the Socio-Economic Assessment (Appendix D.8 of the BA Report).

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
CONSTRUCTION PHASE: DIRECT IMPACTS			
Creation of employment and business opportunities, and opportunity for skills development and on-site training.	**Employment** • Where reasonable and practical the proponent should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories; Due to the low skills levels in the area, the majority of skilled posts are likely to be filled by people from outside the area. • Where feasible, efforts should be made to employ local contactors that are compliant with B-BBEE criteria. • Before the construction phase commences the proponent should meet with representatives from the NKLM and NDM to establish the existence of a skills database for the area. If such a database exists, it should be made available to the contractors appointed for the construction phase. • The local authorities, relevant community representatives and local farmers should be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that the proponent intends following for the construction phase of the project. • Where feasible a training and skills development programmes for local workers should be initiated prior to the initiation of the construction phase. • The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.	**Moderate (+)**	**Moderate (+)**

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
	Business • The proponent should liaise with the NKLM and NDM with regards the establishment of a database of local companies, specifically B-BBEE companies, which qualify as potential service providers (e.g. construction companies, catering companies, waste collection companies, security companies etc.) prior to the commencement of the tender process for construction contractors. These companies should be notified of the tender process and invited to bid for project-related work. • Where possible, the proponent should assist local B-BBEE companies to complete and submit the required tender forms and associated information. • The NKLM and NDM, in conjunction with the local business sector and representatives from the local hospitality industry, should identify strategies aimed at maximising the potential benefits associated with the project. Note that while preference to local employees and companies is recommended, it is recognised that a competitive tender process may not guarantee the employment of local labour for the construction phase.		
Impacts associated with the presence of construction workers on local communities (including an increase in alcohol and drug use; an increase in crime levels; and increase in teenage and unwanted pregnancies and an increase in prostitution and STDs, including HIV).	• Where possible the proponent should make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically for semi and low-skilled job categories. • The proponent should consider the need for establishing a Monitoring Forum (MF) in order to monitor the construction phase and the implementation of the recommended mitigation measures. The MF should be established before the construction phase commences, and should include key stakeholders, including representatives from the NKLM, farmers and the contractor(s). The MF should also be briefed on the potential risks to the local community and farm workers	**Moderate**	**Low**

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
	associated with construction workers. • The proponent and the contractor(s) should, in consultation with representatives from the MF, develop a code of conduct for the construction phase. The code should identify which types of behaviour and activities are not acceptable. Construction workers in breach of the code should be dismissed. All dismissals must comply with the South African labour legislation. • The proponent and contractor (s) should implement an HIV/AIDS awareness programme for all construction workers at the outset of the construction phase. • The contractor should provide transport to and from the site on a daily basis for low and semi-skilled construction workers. This will enable the contractor to effectively manage and monitor the movement of construction workers on and off the site. • Where necessary, the contractors should make the necessary arrangements to enable low and semi-skilled workers from outside the area to return home over weekends and/ or on a regular basis. This would reduce the risk posed to local family structures and social networks. • It is recommended that no construction workers, with the exception of security personnel, should be permitted to stay over-night on the site.		
Impacts related to the potential influx of job-seekers on local communities. Potential impact on family structures, social networks	It is not possible to prevent job seekers from coming to the area in search of a job. However, due to the location of the site the potential influx of job seekers to the area as a result of the proposed Komas WEF will be low. In addition: • The proponent should implement a “locals first” policy, specifically	**Low**	**Low**

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
and community services.	with regard to unskilled and low skilled opportunities.		
Increased risks to safety, livestock and farming infrastructure and operations associated with the construction related activities and presence of construction workers on the site.	• The proponent should enter into an agreement with the local farmers in the area whereby damages to farm property etc. during the construction phase proven to be associated with the construction activities for the WEF will be compensated for. The agreement should be signed before the construction phase commences. • Contractors appointed by the proponent should provide daily transport for workers to and from the site. This would reduce the potential risk of trespassing on the remainder of the farm and adjacent properties. • The proponent should consider the option of establishing a MF that includes local farmers and develop a Code of Conduct for construction workers. This committee should be established prior to commencement of the construction phase. The Code of Conduct should be signed by the proponent and the contractors before the contractors move onto site. • The proponent should hold contractors liable for compensating farmers in full for any stock losses and/or damage to farm infrastructure that can be linked to construction workers. This should be contained in the Code of Conduct to be signed between the proponent, the contractors and neighbouring landowners. The agreement should also cover loses and costs associated with fires caused by construction workers or construction related activities (see below). • The EMPr should outline procedures for managing and storing waste on site, specifically plastic waste that poses a threat to livestock if	**Moderate**	**Low**

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
	ingested. • Contractors appointed by the proponent must ensure that all workers are informed at the outset of the construction phase of the conditions contained on the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms. • Contractors appointed by the proponent must ensure that construction workers who are found guilty of trespassing, stealing livestock and/or damaging farm infrastructure are dismissed and charged. This should be contained in the Code of Conduct. All dismissals must be in accordance with South African labour legislation. • The housing of construction workers on the site should be limited to security personnel.		
Increased risk of grass fires associated with construction related activities.	• The proponent should enter into an agreement with the local farmers in the area whereby losses associated with fires that can be proven to be associated with the construction activities for the WEF will be compensated for. The agreement should be signed before the construction phase commences. • Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas. • No smoking should be permitted on site, except in designated areas. • Contractor should ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the higher-risk dry, windy summer months. • Contractor to provide adequate fire-fighting equipment on-site;	**Moderate**	**Low**

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
	• Contractor to provide fire-fighting training to selected construction staff. • No construction staff, with the exception of security staff, to be accommodated on site overnight. • As per the conditions of the Code of Conduct, in the event of a fire proven to be caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor should also compensate the fire-fighting costs borne by farmers and local authorities.		
Noise, dust, waste and safety impacts of construction related activities and vehicles.	• As far as possible, the transport of components to the site along the N7 should be planned to avoid weekends and holiday periods. • The contractor should inform local farmers and representatives from the NLM and NDM Tourism of dates and times when abnormal loads will be undertaken. • The contractor must ensure that damage caused by construction related traffic to the gravel public roads and local, internal farm roads is repaired on a regular basis throughout the construction phase. The costs associated with the repair must be borne by the contractor. • Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis, adhering to speed limits and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers. • All vehicles must be road-worthy and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits. • The Contractor should ensure that workers are informed that no waste can be thrown out of the windows while being transported to	**Moderate**	**Low**

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
	and from the site. Workers who throw waste out windows should be fined. • The Contractor should be required to collect waste along access roads on a weekly basis. • Waste generated during the construction phase should be transported to the local permitted landfill site. • EMPr measures (and penalties) should be implemented to ensure farm gates are closed at all times. • EMPr measures (and penalties) should be implemented to ensure speed limits are adhered to at all times.		
Impacts on productive farmland due to construction activities.	• The location of wind turbines, access roads, laydown areas etc. should be informed by the findings of the Agriculture and Terrestrial Biodiversity (flora) study. In this regard areas of sensitive vegetation and soils of high agriculture potential should be avoided. • The footprint areas for the establishment of individual wind turbines should be clearly demarcated prior to commencement of construction activities. All construction related activities should be confined to the demarcated area and minimised where possible. • An ECO should be appointed to monitor the establishment phase of the construction phase. • All areas disturbed by construction related activities, such as access roads on the site, construction platforms, workshop area etc., should be rehabilitated at the end of the construction phase. The rehabilitation plan should be informed by input from the soil scientist and discussed with the local farmer. • The implementation of a rehabilitation programme should be included in the terms of reference for the contractor/s appointed.	**Moderate**	**Low**

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
	• The implementation of the Rehabilitation Programme should be monitored by the ECO. • All workers should receive training/ briefing on the reasons for and importance of not driving in undesignated areas. • EMPr measures (and penalties) should be implemented to strictly limit all vehicle traffic to designated roads and construction areas. Under no circumstances should vehicles be allowed to drive into the veld. • Disturbance footprints should be reduced to the minimum. • Compensation should be paid by the Project Developer to farmers that suffer a permanent loss of land due to the establishment of the WEF. Compensation should be based on accepted land values for the area.		
OPERATIONAL PHASE: DIRECT IMPACTS			
Establishment of clean renewable energy infrastructure.	Should the project be approved the proponent should: • Implement a skills development and training program aimed at maximizing the number of employment opportunities for local community members. • Maximise opportunities for local content, procurement and community shareholding. • Consider establishing a visitor centre.	**High (+)**	**High (+)**
Creation of employment and business opportunities. The operational phase will also create opportunities for skills development and training.	The enhancement measures listed above, i.e. to enhance local employment and business opportunities during the construction phase, also apply to the operational phase. In addition: • The proponent should implement a training and skills development programme for locals during the first 5 years of the operational phase. The aim of the programme should be to maximise the number of	**Low (+)**	**Moderate (+)**

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
	South African's and locals employed during the operational phase of the project. • The proponent, in consultation with the NKLM and NDM, should investigate the options for the establishment of a Community Development Trust (see below).		
Benefits associated with the establishment of a Community Trust.	• The NKLM and NDM should be consulted as to the structure and identification of potential trustees to sit on the Trust. The key departments in the NKLM and NDM that should be consulted include the Municipal Managers Office, IDP Manager and LED Manager. • Clear criteria for identifying and funding community projects and initiatives in the area should be identified. The criteria should be aimed at maximising the benefits for the community as a whole and not individuals within the community. • Strict financial management controls, including annual audits, should be instituted to manage the funds generated for the Community Trust from the WEF.	**Moderate (+)**	**High (+)**
Benefits for affected landowners through the generation of income.	• Implement agreements with affected landowners.	**Moderate (+)**	**Low (+)**
The visual impacts and associated impact on sense of place and rural character of the landscape.	• The recommendations contained in the VIA should be implemented. • Recommended that the Project Applicants meet with the affected landowners to discuss the possibility relocating wind turbines that have the highest potential visual impact.	**Moderate**	**Low**
Impact on property values and operations.	• The recommendations contained in the VIA should be implemented. • Recommended that the Project Applicants meet with the affected landowners to discuss the possibility relocating wind turbines that have the highest potential visual impact.	**Low**	**Low**

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
Impact on tourism.	• The recommendations contained in the VIA should be implemented.	**Low (-) & (+)**	**Low (-) & (+)**
DECOMMISSIONING PHASE: DIRECT IMPACTS			
Social impacts associated with retrenchment including loss of jobs, and source of income.	• The proponent should ensure that retrenchment packages are provided for all staff retrenched when the WEF is decommissioned. • All structures and infrastructure associated with the proposed facility should be dismantled and transported off-site on decommissioning. • The proponent should investigate the option of establishing an Environmental Rehabilitation Trust Fund to cover the costs of decommissioning and rehabilitation of disturbed areas. The Trust Fund should be funded by a percentage of the revenue generated from the sale of energy to the national grid over the 20-year operational life of the facility. The rationale for the establishment of a Rehabilitation Trust Fund is linked to the experiences with the mining sector in South Africa and failure of many mining companies to allocate sufficient funds during the operational phase to cover the costs of rehabilitation and closure. Alternatively, the funds from the sale of the WEF as scrap metal should be allocated to the rehabilitation of the site.	**Moderate**	**Low**
CUMULATIVE IMPACTS			
OPERATIONAL PHASE: INDIRECT IMPACT			
Visual impacts associated with the establishment of more than one WEF and the potential impact on the area's rural sense of place and character of the landscape.	• The recommendations contained in the VIA should be implemented.	**Moderate**	**Low**
Impact on local services and accommodation. The establishment	• The Northern Cape Provincial Government, in consultation with the NKLM and NDM and the proponents involved in the development	**Moderate**	**Low**

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
of a number of renewable energy facilities in the NKLM will place pressure on local services, specifically medical, education and accommodation.	renewable energy projects in the area should consider establishing a Development Forum to co-ordinate and manage the development and operation of REFs in the area, with the specific aim of mitigating potential negative impacts and enhancing opportunities. This would include identifying key needs, including capacity of existing services, accommodation and housing and the implementation of an accredited training and skills development programmes aimed at maximising the opportunities for local workers to be employed during the construction and operational phases of the various proposed projects. These issues should be addressed in the Integrated Development Planning process undertaken by the NKLM and NDM.		
Impact on local economy. The establishment of a number of wind energy facilities in the NKLM will create employment, skills development and training opportunities, creation of downstream business opportunities.	• The proposed establishment of suitably sited renewable energy facilities within the NKLM and NDM should be supported.	**Moderate (+)**	**High (+)**

D.2.9.5 Comparative assessment of alternatives

Two BESS and on-site SS complex site Alternatives (i.e. Option 1 and Option 2) have been identified for assessment as part of the BA process. Option 1 and Option 2 have been assessed and both alternatives are found to be acceptable from a socio-economic perspective and may proceed as none are fatally flawed.

D.2.9.6 Assessment of No-Go Alternative

The No-Go Development alternative would represent a lost opportunity for South Africa to supplement is current energy needs with clean, renewable energy. Given South Africa's position as one of the highest per capita producer of carbon emissions in the world, this would represent a High negative social cost. The No-Go Development alternative also represents a lost opportunity in terms of the employment and business opportunities (construction and operational phase) associated with the proposed Komas WEF and the benefits associated with the establishment of a Community Trust. This also represents a negative social cost.

However, at a provincial and national level, it should be noted that the proposed Komas WEF development is not unique. In this regard, a significant number of other renewable energy developments are currently proposed in the Northern Cape and other parts of South Africa. Foregoing the proposed establishment of WEFs would therefore not necessarily compromise the development of REFs in the Northern Cape Province and or South Africa. However, the socio-economic benefits for local communities in the NKLM would be forfeited. Given the decline in the role played by mining and the limited economic opportunities in the NKLM, the No-Go Development Alternative would represent a significant lost opportunity for the area and is not supported by the findings of the Socio-Economic Assessment. The No-Go Development alternative is rated as High Negative.

D.2.9.7 Concluding Statement

The findings of the Socio-Economic Assessment indicate that the development of the proposed Komas WEF and associated infrastructure will create employment and business opportunities for locals during both the construction and operational phase of the project. The establishment of a Community Trust will also benefit the local community. The proposed development also represents an investment in clean, renewable energy infrastructure, which, given the negative environmental and socio-economic impacts associated with a coal based energy economy and the challenges created by climate change, represents a significant positive social benefit for society as a whole. The findings of the Socio-Economic Assessment also indicate that the REIPPPP has resulted in significant socio-economic benefits, both at a national, a local and community level. These benefits are linked to FDI, local employment and procurement and investment in local community initiatives.

The establishment of Community Trusts associated with renewable energy projects also have the potential to create significant benefits for local rural communities. These benefits should be viewed within the context of the limited economic opportunities in the area and the impact of the decline in the mining sector on the local economy. The proposed Komas WEF site is also located within a REDZ. The area has therefore been identified as suitable for the establishment of renewable energy facilities.

It is recommended that the establishment of the proposed Komas WEF is strongly supported by the findings of the Socio-Economic Assessment.

D.2.10 Noise Specialist Assessment

The Noise Specialist Assessment was undertaken by Morné De Jager of Enviro-Acoustic Research cc inform the outcome of this BA from a noise perspective. The Noise Specialist Assessment was undertaken in terms of the requirements of the Noise Protocol as per GN 320 published on 20 March 2020 in GG No. 43110. The complete Noise Assessment is included in Appendix C.9 of this report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Noise Assessment. The information below is extracted from De Jager (2020) (Appendix C.9 of the BA Report).

D.2.10.1 Approach and Methodology

This Noise Specialist Assessment considered local and international guidelines, using the Terms of Reference (ToR) as proposed by SANS 10328:2008 and as proposed by the requirements specified in the Assessment Protocol for Noise that were published on 20 March 2020, in Government Gazette 43110, Government Notice (GN) 320. Based on the Protocol for Noise Assessment, a Noise Specialist Assessment was conducted as parts of the proposed development footprint fall within an area of "very high" sensitivity from a noise perspective.

The potential noise impact associated with the construction, operation and decommissioning of the proposed Komas WEF was evaluated using a sound propagation model. Conceptual scenarios were developed for the construction and operational phases.

D.2.10.2 Relevant Project Aspects relating to Noise Impacts

The following project aspects are related to noise impacts:

- Various construction activities taking place simultaneously during the day may increase ambient sound levels due to air-borne noise.
- Various construction activities taking place simultaneously at night may increase ambient sound levels due to air-borne noise.
- Various construction vehicles passing close to potential noise-sensitive receptors may increase ambient sound levels and create disturbing noises.
- Wind turbines operating simultaneously during the day. Increases in ambient sound levels due to air-borne noise from the wind turbines.
- Wind turbines operating simultaneously at night. Increases in ambient sound levels due to air-borne noise from the wind turbines.
- Various decommissioning activities taking place simultaneously during the day may increase ambient sound levels due to air-borne noise.

D.2.10.3 Potential Impacts

The potential impacts identified in the Noise Assessment include:

Construction Phase:

- Potential increase in ambient sound levels due to construction activities during the day;
- Potential increase in ambient sound levels due to construction activities at night;

- Potential increase in ambient sound levels due to construction of roads; and
- Potential increase in ambient sound levels due to day-time construction traffic.

The construction phase will entail a number of activities which may have a noise impact on the surrounding area. There will be a short-term increase in noise in the vicinity of the site during construction as the ambient level will be exceeded. The impact during construction will be difficult to mitigate. The impact of low frequency noise and infra-sound will be negligible and there is no evidence to suggest that adverse health effects will occur as the sound power levels generated in the low frequency range are not high enough to cause physiological effects. Construction activities will take place during the day, while night-time construction activities are not envisaged, there may be times when activities may take place after 22:00 at night, or before 06:00 in the morning. Considering potential delays' relating to civil works (especially concrete pouring that must be undertaken in one go), the potential significance due to night-time construction activities was assessed.

The significance of the impact due to an increase in ambient sound levels due to construction activities during the day was rated as very low during the day and low at night following mitigation.

Operational Phase:

- Potential increase in ambient sound levels due to air-borne noise from the wind turbines operating simultaneously during the day; and
- Potential increase in ambient sound levels due to air-borne noise from the wind turbines operating simultaneously at night.

The proposed development would be designed to have an operational life of up to 20 years with the possibility to further expand the lifetime of the WEF. The only development related activities on-site will be routine servicing (access roads and light traffic) and unscheduled maintenance. The potential noise impact from maintenance activities is insignificant, with the main noise source being the wind turbine blades and the nacelle (components inside).

Noise emitted by operating wind turbines can be associated with two types of noise sources. These are aerodynamic sources due to the passage of air over the wind turbine blades and mechanical sources which are associated with components of the power train within the turbine, such as the gearbox and generator and control equipment for yaw, blade pitch, etc. These sources normally have different characteristics and can be considered separately. In addition, there are other noise sources of lower levels, such as the substations and traffic (maintenance).

Typically, daytime noise impacts are less than the night-time noise impact due to higher acceptable noise limits and the probability of a noise impact occurring being less. With no potential NSD living within 500 m from any wind turbines, the significance of the daytime noise impact is less than the night-time impact.

The significance of the noise impact associated with the operating WTGs during the day was rated to be of very low significance during the day and of low significance during the night following mitigation.

Decommissioning Phase:

- Potential increase in ambient sound levels due to air-borne noise from various decommissioning activities taking place simultaneously during the day.

Final decommissioning activities will have a noise impact lower than either the construction or operational phases. This is because decommissioning and closure activities normally take place during the day using minimal equipment (due to the decreased urgency of the project). While there may be various activities, there is a very small risk for a noise impact. The significance of any noise impact associated with the proposed decommissioning activities during the day would be very low, similar to the construction noise impact.

Cumulative Impact:

- Increase in ambient sound levels due to air-borne noise from the wind turbines from various WEFs operating at night.

Considering the contribution from the Komas WEF on total cumulative noises, if the Namas, Zonnequa, Kleinzee, Gromis, Project Blue and Kap Vley WEFs are to be developed, is well less than 3 dBA. The potential significance of the cumulative noise impact from these WEFs operating simultaneously at night is assessed to be very low following mitigation.

Indirect cumulative impacts were identified.

D.2.10.4 Impact Assessment

The table below includes an assessment of the potential **direct noise impacts** identified for the proposed Komas WEF and associated infrastructure for the construction, operational and decommissioning phases. It also includes an assessment of the potential cumulative impacts.

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
CONSTRUCTION PHASE: DIRECT IMPACTS			
Increase in ambient sound levels due to construction activities during the day.	• None. Significance of noise impact is very low for the scenario as conceptualised.	**Very Low**	**Very Low**
Increase in ambient sound levels due to construction activities at night.	• The Project Developer should investigate any reasonable and valid noise complaint if registered by a receptor staying within 2,000 m from the location where construction activities are taking place; and • The Project Developer should minimise night-time construction traffic if the access road is closer than 150 m from any NSD, alternatively, the access road must be relocated further than 150 m from NSDs (night-time traffic passing occupied houses).	**Low**	**Low**
Increase in ambient sound levels due to construction of roads.	• The Project Developer should investigate any reasonable and valid noise complaint if registered by a receptor staying within 2,000 m from the location where construction activities are taking place; and • The Project Developer should minimise night-time construction traffic if the access road is closer than 150 m from any NSD, alternatively, the access road must be relocated further than 150 m from NSDs (night-time traffic passing occupied houses).	**Very Low**	**Very Low**
Increase in ambient sound levels due to day-time construction traffic.	• It is recommended that new roads not be constructed within 150 m from occupied dwellings used for residential purposes at night.	**Very Low**	**Very Low**

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
OPERATIONAL PHASE: DIRECT IMPACTS			
Increase in ambient sound levels due to air-borne noise from the wind turbines operating simultaneously during the day.	• No mitigation required or recommended for daytime operational activities.	**Very Low**	**Very Low**
Increase in ambient sound levels due to air-borne noise from the wind turbines operating simultaneously at night.	• The Project Developer should investigate any reasonable and valid noise complaint if registered by a receptor staying within 2,000 m from the location where operational activities are taking place.	**Low**	**Low**
DECOMMISSIONING PHASE: DIRECT IMPACT			
Increase in ambient sound levels due to air-borne noise from various decommissioning activities taking place simultaneously during the day.	• No mitigation required or recommended for decommissioning activities.	**Very Low**	**Very Low**
CUMULATIVE IMPACT			
OPERATIONAL PHASE: INDIRECT IMPACT			
Increase in ambient sound levels due to air-borne noise from the wind turbines from various WEFs operating at night.	• The Project Developer should investigate any reasonable and valid noise complaint if registered by a receptor staying within 2,000 m from the location where operational activities are taking place.	**Very Low**	**Very Low**

D.2.10.5 Comparative Assessment of Alternatives

Two BESS and on-site SS complex site alternatives were proposed for assessment (Option 1 and Option 2). There is no difference in the potential noise impact associated with Option 1 and Option 2. Therefore, both alternatives (Option 1 and Option 2) are acceptable from a noise perspective.

D.2.10.6 Assessment of No-Go Alternative

The ambient sound levels will remain as is (relatively low).

D.2.10.7 Concluding statement

The Noise Assessment is based on a predictive model to estimate potential noise levels due to the various activities and to assist in the identification of potential issues of concern. The Noise Specialist Assessment was undertaken in terms of the requirements of the Noise Protocol as per GN 320 published in GG No. 43110 on 20 March 2020.

Considering the low to very low significance of the potential noise impacts (with mitigation, inclusive of cumulative impacts) for the proposed Komas WEF and associated infrastructure, it is recommended that the proposed Komas WEF and associated infrastructure be authorised from a noise perspective.

D.2.11 Transport Impacts

The Transport Impact Assessment was undertaken by Adrian Johnson of JG AFRIKA (Pty) Ltd to inform the outcome of this BA from a transport perspective. The complete Transport Impact Assessment is included in Appendix C.10 of this report The information below is extracted from Johnson (2020) and provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Transport Impact Assessment.

D.2.11.1 Approach and Methodology

The Transport Impact Assessment identifies and assesses the potential traffic impact on the surrounding road network in the vicinity of the site during the construction of the access roads, installation of the turbines during the operational phase, and the potential removal of the turbines during the decommissioning phase of the proposed Komas WEF.

The Transport Impact Assessment included the following tasks:

<u>Site Visit and Project Assessment</u>

- An initial meeting with the client to gain sound understanding of the project;
- Overview of project background information including location maps, component specifications and any resulting abnormal loads to be transported; and
- Research of all available documentation and information relevant to the proposed WEF and SS.

Correspondence with Authorities

- Correspondence with the relevant Authorities dealing with the external road network, such as the South African National Roads Agency SOC Ltd (SANRAL) and the Northern Cape Provincial Department of Transport and Public Works.

Traffic and Route Assessment

- Trip generation and potential traffic impact;
- Possible haul routes between port of entry / manufacturing location and sites in regards of
    - National route;
    - Local route;
    - Site access route (internal roads); and
    - Road limitations due to abnormal loads.

- Construction and maintenance (operational) vehicle trips
    - Generated vehicles trips;
    - Abnormal load trips;
    - Access requirements;
    - Possible damaging effects on road surface; and
    - Scheduling of transport (i.e. during night).
- Station data will be obtained as far as available from SANRAL for the closest national roads.
- Investigation of the impact of the development traffic generated during construction and operation and decommissioning phases of the project.

Access and Internal Roads Assessment

- Assessment of the proposed access points including:
    - Feasible location of access points;
    - Motorised and non-motorised access requirements;
    - Queuing analysis and stacking requirements if required;
    - Access geometry; and
    - Sight distances and required access spacing.
- Assessment of the proposed internal roads on site.
- Assessment of internal circulation of trucks and proposed roads layout in regard to turbine positions and turbine laydown areas.

Report

- Reporting on all findings and preparation of the report.

D.2.11.2 Relevant Project Aspects relating to Transport Impacts

The relevant project aspects relating to traffic impacts are linked to the vehicles that need to access the project site for various reasons. It is understood that traffic will be generated as a result of turbine components and infrastructure, building materials and construction workers being transported to and from site. Turbine components, including the nacelle, blades, tower sections, turbine hub and rotary units, cranes and transformers will be transported to site. Abnormal load trucks permits will need to be applied for in terms of Section 81 of the National Road Traffic Act (Act 93 of 1996). The imported turbine components may be transported from the Port of Entry to the nearby turbine laydown area.

Mobile cranes will be required at these turbine laydown areas to position the respective components at their temporary storage location.

In addition to transporting the wind turbine components and specialised lifting equipment, the normal Civil Engineering construction materials, plant and equipment will need to be brought to the site (e.g. sand, stone, cement, concrete batching plant, gravel for road building purposes, excavators, trucks, graders, compaction equipment, cement mixers, transformers in the SS, cabling, transmission pylons etc.). Other components, such as electrical cables and SS transformers, will also be transported to site during construction. The transportation of these items will generally be conducted with normal heavy loads vehicles. In addition, construction workers will also be transported to and from site during the construction phase and this add to the potential transport impacts.

D.2.11.3 Potential Impacts

The potential impacts identified in the Transport Impact Assessment are listed below:

Construction Phase:

- Increased traffic due to the construction of the proposed Komas WEF and associated infrastructure including the transportation of turbine components to site;
- Increased traffic due to the transportation of construction staff, equipment and materials to site;
- The increased traffic due to the construction activities would lead to noise and dust pollution; and
- Increased traffic due to the construction of roads, excavations of turbine foundations, trenching for electrical cables and other ancillary construction works that will temporarily generate the most traffic.

Traffic generated by the construction of the proposed Komas WEF will have an impact of high significance on the surrounding road network before mitigation measures are implemented.

All further components will be transported with normal limitations haulage vehicles. With approximately 14 abnormal load trips (as specified above in Section A), the total trips to deliver the components of 50 steel tower turbines to the WEF site will be around 700 trips (14 trips x 50 turbines). This would amount to approximately 1.3 vehicle trip per day (700 trips / 24 months / 22 working days per month) to site for a typical construction period of 24 months.

The concrete tower sections are typically delivered in 2-4 precast segments, which are then assembled on-site to form the respective tower section. It was assumed that the first 140 m sections will be precast in four segments each and the last 60 m sections in two segments each. The total number of abnormal load trips for a concrete turbine is approximately 34 trips. For concrete tower sections, the 20 m sections of the 200 m tower will be split into 4 segments (1 trip per segment), except for the last 60 m of the tower which would have 2 segments per section. The calculation is therefore – 140 m of the tower / 20 m section = 7 sections, 7 sections x 4 segments = 28 segments (trips). The remaining 60 m of the tower (3 sections of 20m) will consist of 2 segments each = 6 segments. Therefore, the total number of abnormal trips to deliver the concrete towers is 28 + 6 segments = 34 segments or trips. The total trips to deliver the components of 50 turbines to the WEF site will be around 1 700 trips (34 trips x 50 turbines). This would amount to approximately 3.2 vehicle trips per day (1 700 trips / 24 months / 22 working days per month) to site for a typical construction period of 24 months.

The exact number of trips generated during construction will be determined by the haulage company transporting the components to site, the turbine model, the staff requirements and where equipment is sourced from.

However, the duration of this phase is short-term i.e. the potential impact of the traffic generated during the construction phases of the proposed Komas WEF traffic on the surrounding road network is temporary. The significance of impact can therefore be reduced to a moderate impact following mitigation.

Additionally, the construction of the WEF will create dust and noise pollution that will have an impact of low significance (short-term) during the construction and decommissioning phases.

Operational Phase:

During operation, it is expected that staff including security personnel will periodically visit the site. It is assumed that approximately ten (20) full-time employees will be stationed on site. The traffic generated during this phase will be minimal and will not have an impact on the surrounding road network.

Decommissioning Phase:

- Construction related traffic; and
- Noise and dust pollution.

The decommissioning phase will result in the same impact as the Construction Phase as similar trips are expected. The potential traffic impact will be of high significance before mitigation measures during the construction and decommissioning phases. However, considering that this is temporary and short-term in nature, the impact can be mitigated to an acceptable level of moderate significance.

Cumulative impacts:

- Traffic congestion/delays on the surrounding road network; and
- Noise and dust pollution.

To assess the cumulative impact, it was assumed that all wind farms within 50 km currently proposed and authorized, would be constructed at the same time. This is the precautionary approach as in reality; these projects would be subject to a highly competitive bidding process and not all the projects may be selected to enter into a PPA with Eskom. There are currently nine approved WEFs and three approved solar PV facilities. A separate BA will be undertaken for the proposed Gromis WEF. The Klipdam and Nigramoep solar PV applications are in progress. Even if all the facilities are constructed and decommissioned at the same time, the roads authority will consider all applications for abnormal loads and work with all project companies to ensure that loads on the public roads are staggered and staged to ensure that the impact will be acceptable.

The construction and decommissioning phases of a WEF are the only significant traffic generators. The duration of these phases is short term i.e. the potential impact of the traffic generated during the construction and decommissioning phases of the proposed Komas WEF traffic on the surrounding road network is temporary and WEFs, when operational, do not add any significant traffic to the road network. The cumulative impacts were assessed to be of high significance before mitigation and moderate significance after mitigation.
No indirect impacts have been identified.

D.2.11.4 Impact Assessment

The table below includes an assessment of the potential **direct impacts** identified for the proposed Komas WEF and associated infrastructure for the **construction, operational and decommissioning phases**. It also includes an assessment of cumulative impacts.

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
CONSTRUCTION PHASE			
Traffic congestion and delays. Noise and dust pollution.	• Stagger turbine component delivery to site. • Reduce the construction period. • Stagger the construction of the turbines. • The use of mobile batch plants and quarries in close proximity to the site would decrease the impact on the surrounding road network. • Staff and general trips should occur outside of peak traffic periods, where possible. • Maintenance of haulage routes. • Design and maintenance of internal roads. • Dust suppression.	**High**	**Moderate**
OPERATIONAL PHASE			
The traffic generated during this phase will be minimal and will have a nominal impact on the surrounding road network.			
DECOMMISSIOING PHASE			
Traffic congestion and delays. Noise and dust pollution	• Stagger turbine component transportation. • Reduce the construction period. • Stagger the construction of the turbines. • Staff and general trips should occur outside of peak traffic periods. • Maintenance of haulage routes and internal roads. • Dust suppression.	**High**	**Moderate**

CUMULATIVE IMPACTS			
Traffic congestion and delays. Noise and dust pollution.	• Stagger turbine component transportation. • Reduce the construction period. • Stagger the construction of the turbines. • Staff and general trips should occur outside of peak traffic periods. • Dust suppression.	**High**	**Moderate**

D.2.11.5 Comparative Assessment of Alternatives

It should be noted that there is no difference between the BESS and on-site SS complex area Option 1 and Option 2 alternatives from a transport perspective. Both alternatives are deemed acceptable and may proceed as none are fatally flawed.

Specialist	Option 1	Option 2
Transport	No Preference	No Preference
	There is no difference between the alternatives from a Transport perspective. Both alternatives are acceptable.	

D.2.11.6 Assessment of No-Go Alternative

The No-Go alternative implies that the proposed development of the Komas WEF will not proceed. This would mean that there will be no negative environmental impacts and no traffic impact on the surrounding network during the construction and decommissioning phases of the proposed Komas WEF. However, this would also mean that there would be no socio-economic benefits to the surrounding communities, and it will not assist government in meeting its' targets for renewable energy. **Hence, the No-Go alternative is not a preferred alternative.**

D.2.11.7 Concluding Statement

Based on the findings of this assessment, the potential increase in traffic and the associated noise and dust pollution have been rated as high before mitigation during the construction and decommissioning phases of the proposed Komas WEF. However, the phases will be short-term and the traffic volumes are expected to be low. Therefore, the significance of the impacts can be reduced to moderate after mitigation. It is envisaged that most materials, water, plant, services and people will be procured within a 60 km radius from the proposed Komas WEF. **The potential impacts associated with proposed Komas WEF and associated infrastructure are acceptable from a transport perspective and it is therefore recommended that the proposed facility be authorised, provided that the proposed recommendations and mitigation measures are adhered to.**

D.2.12 Geotechnical Impact Assessment

The Geotechnical Impact Assessment was undertaken by Robert Leyland of WSP Environmental (Pty) Ltd to inform the outcome of this BA from a Geotechnical perspective. The complete Geotechnical Impact Assessment is included in Appendix C.11 of this BA Report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Geotechnical Impact Assessment. The information below is extracted from the Geotechnical Impact Assessment (Appendix C.11 of the BA Report). It should be noted that a detailed complete engineering geotechnical study will be undertaken during design phase.

D.2.12.1 Approach and Methodology

The scope of works is limited to a desktop review and interpretative reporting on the findings. All interpretations are presented in light of the proposed development and are therefore project specific. The most significant geotechnical condition that will affect the development is the expected hard excavation conditions.

D.2.12.2 Relevant Project Aspects relating to Geotechnical Impacts

The assessment considers the entire development but the main parts of the development, i.e. the large structures, namely turbines, cable trenches and access roads are the primary consideration. Aspects related to the Geotechnical impacts during the construction phase include soil erosion, disturbance of development areas, slope stability and seismic activity. Aspects during the decommissioning phase include soil erosion, disturbance of development areas and slope stability and seismic activity.

D.2.12.3 Potential Impacts

The potential Geotechnical impacts are listed below:

Construction Phase:

- Potential topsoil degradation;
- Potential disturbance of fauna and flora;
- Potential erosion and slope instability around structures; and
- Potential damage/destruction of the proposed development.

The construction phase will entail excavations for turbine foundations. The majority of the proposed Komas WEF site is expected to have hard excavation difficulties for any excavations deeper than 1m. This is due to the occurrence of calcrete or silcrete horizons at shallow depths. The thickness of these horizons should be investigated during further geotechnical investigations. Isolated areas where aeolian sand deposits have accumulated may have deeper soils but excavation conditions are expected to be generally hard.

The conditions at the proposed Komas WEF site are such that the use of shallow foundation solutions is feasible and will prevent the need for excessive excavations in pedocretes or hard rock. The proposed structures are however very tall and subject to high moments which require the foundations to prevent overturn. The use of a foundation anchoring system will therefore be required as an alternative to deep excavated bases. The proposed base footprints will require detailed geotechnical investigations to ensure the foundation design accounts for the geotechnical characteristics of the

predocrete and bedrock conditions. Along the servitude line the use of shallow foundations for grid infrastructure with similar foundations anchoring systems is recommended to prevent the need for excessive excavations.

The proposed geotechnical impacts were rated to be of very low significance before and after mitigation during the construction phase.

Decommissioning Phase:

- Potential topsoil degradation;
- Potential disturbance of fauna and flora; and
- Potential erosion and slope instability in areas where structures are removed.

No indirect impacts have been identified; and no impacts were identified during the operational phase.

D.2.13 Wake Effect Assessment

In addition to the environmental assessments that were undertaken as indicated above, a Wake Effect Assessment was also commissioned by the Project Applicant.

At the second pre-application meeting with DEFF on 7 October 2020 (Appendix H.3), DEFF requested that a Wake Effect assessment be conducted to determine the potential wake effect on the adjacent proposed WEFs, i.e. the Kap Vley (proposed by Kap Vley Wind Farm (Pty) Ltd), Namas (proposed by Genesis Namas Wind (Pty) Ltd) and Zonnequa (proposed by Genesis Zonnequa Wind (Pty) Ltd) and Gromis WEFs (proposed by Genesis ENERTRAG Gromis Wind (Pty) Ltd). A Wake Effect Assessment was therefore commissioned by the Project Applicant and has been undertaken by Mr. Kennett Sinclair of DNV GL South Africa (Pty) Ltd as part of the BA process. Please refer to Appendix J.2 for the Wake Effect Assessment. A summary of the Wake Effect Assessment is provided in Appendix D. The Project Applicant is currently liaising with the project developer of the adjacent proposed Zonnequa WEF, Genesis Zonnequa Wind (Pty) Ltd to reduce the potential wake loss on the proposed Zonnequa WEF. As the results of the Wake Effect assessment are based on several assumptions and there is a significant level of uncertainty in the assessment, it is recommended that a detailed Wake Effect assessment be undertaken by a mutually agreed independent service provider to verify the impact and determine appropriate mitigation measures once the turbine layout and model's have been finalised for both the Komas and Zonnequa WEFs. All mitigation measures to reduce the wake effects would be incorporated into the Final layout and Final EMPr prior to submission to DEFF for approval. Various options are currently being discussed and an approach amenable to both the Project Applicant and Genesis Zonnequa Wind (Pty) Ltd will be sought prior to construction commencing following detailed modelling studies.

The results from the study to predict the magnitude of the external wake loss of the Komas WEF on the energy production of the neighbouring proposed WEFs are provided below.

Table: Predicted external wake loss due to the Komas WEF (extracted from DNV GL, 2021)

Neighbouring wind farm	Komas Turbine Model	
	GE-5.5-158	SG-170-6.2 M01[1]
Klap Vley	0.6%	0.7%
Namas	0.4%	0.5%
Zonnequa	3.3%	3.6%
Gromis	0.4%	0.5%

1. This scenario considers the SG-170-6.2 M01 model supplied for the Klap Vley wind farm instead of the GE-5.5-158 model to demonstrate the sensitivity of the external wake loss on the turbine model used.

DNV GL developed a model to estimate the wind farm level blockage effects, as described in DNV GL's 2018 Methodology Refinements White Paper /17/. Due to the preliminary nature of the analysis and the level of assumptions made regarding wind farm layouts, turbine models and hub heights, DNV GL has not estimated the effect of blockage on the wind farms under consideration.

The results of the wake effects assessment show that the proposed Zonnequa WEF will experience the highest potential wake loss at 3.3 % compared to the other neighbouring WEFs. The wake effects assessment notes that given the location of the proposed Komas WEF upstream of the neighbouring proposed Zonnequa WEF in the direction of the prevailing wind, it is unlikely that any single wake mitigation strategy will be effective. Further layout optimisation of the most northern turbines which are closest to the Zonnequa wind farm could be investigated, as well as other potential mitigation approaches including wind sector management strategies.

The Project Applicant has engaged with and will continue to engage with Genesis Zonnequa Wind (Pty) Ltd and an approach amenable to both parties will be sought prior to construction commencing.

D.2.13.1 Impact Assessment

The table below includes an assessment of the potential **direct geotechnical impacts** identified for the proposed Komas WEF and associated infrastructure for the **construction and decommissioning phases**.

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
CONSTRUCTION PHASE: DIRECT IMPACTS			
Topsoil degradation.	Maintain vegetation cover as far as possible; strip, stockpile and re-spread topsoil. Proper construction management.	**Very Low**	**Very Low**
Disturbance of fauna and flora.	Foundation design to avoid blasting and deep excavation into sound rock.	**Very Low**	**Very Low**
Erosion and slope instability around structures.	Avoid steep slope areas, design any cuts slopes according to detailed geotechnical analysis.	**Very Low**	**Very Low**
Damage/destruction of the proposed development: Seismic activity	Design according to expected peak ground acceleration.	**Very Low**	**Very Low**
OPERATIONAL PHASE			
No impacts have been identified during the operational phase.			
DECOMMISSIOING PHASE: DIRECT IMPACTS			
Topsoil degradation.	Maintain vegetation cover as far as possible; strip, stockpile and re-spread topsoil, proper decommissioning management.	**Very Low**	**Very Low**
Disturbance of fauna and flora.	Foundation design to avoid blasting and deep excavation into sound rock.	**Very Low**	**Very Low**
Erosion and slope instability in areas where turbines are removed.	Fill any excavations or flatten any slopes that may form due to/during removing infrastructure.	**Very Low**	**Very Low**
CUMULATIVE IMPACTS			

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
Topsoil degradation	Maintain vegetation cover as far as possible; strip, stockpile and re-spread topsoil. Proper construction and decommissioning management.	**Very Low**	**Very Low**
Disturbance of fauna and flora	Foundation design to avoid blasting and deep excavation into sound rock in the construction and decommissioning phases.	**Very Low**	**Very Low**
Erosion and slope instability around existing and removed structures	Avoid steep slope areas, design any cuts slopes according to detailed geotechnical analysis during the construction phase.	**Very Low**	**Very Low**
Damage/destruction of the proposed development: Seismic activity	Design according to expected peak ground acceleration during the construction phase.	**Very Low**	**Very Low**

D.2.13.2 Comparative Assessment of alternatives

There is no preferred alternative between the BESS and on-site SS complex area Option 1 or Option 2 with respect to the geotechnical impact assessment. Both alternatives are favourable.

D.2.13.3 Assessment of No-Go Alternative

Should the proposed Komas WEF not be developed, there will be no geotechnical impacts associated with the proposed development.

D.2.13.4 Concluding Statement

The most significant geotechnical condition that will affect the development is the expected hard excavation conditions. It is therefore recommended that shallow foundations that are anchored to the bedrock are considered. This will require a detailed study of the rock mass and pedocrete properties at the wind turbine locations. The excavation conditions will also affect the trench excavation costs negatively.

Minimal slope stability issues are expected as slope areas are minimal. No other problem soils or problem geotechnical conditions are expected on site. Access roads can be developed as gravel road with suitable wearing-course to protect the subgrade likely being obtained from local calcrete deposits. The impacts of the development have been assessed and all geotechnical impacts are considered to have a very low significance.

The completed desktop assessment of the geotechnical conditions at the proposed development site of the Komas WEF has shown the site to be generally suitable for the proposed development. The proposed development should, from a geotechnical impact perspective, be authorised.

D.2.14Impacts relating the BESS

The specialists have assessed the BESS as part of the proposed project components. None of the specialists have identified any specific impacts or concerns relating to the BESS. However, to ensure that all aspects and impacts are covered, additional potential impacts relating to the Lithium-ion BESS have been identified by the EAP.

D.2.14.1 Potential Impacts and Recommended Mitigation Measures

In addition to the impacts identified and assessed by the specialists, the following potential impacts have been identified by the EAP relating to the BESS:

- Risk of fire, explosion or release of toxic gas;
- Spillage of electrolytes; and
- Waste generation.

Risk of fire, explosion or release of toxic gas:

The electrolytes contained within the sealed and fully integrated BESS are slightly corrosive but the risk of fire or an explosion or release of gas occurring is not considered highly probable. The lithium-ion BESS will be located outside in sealed containers. Provided that the lithium-ion BESS is

assembled and operated in line with the relevant specifications of the manufacturer or supplier, especially from a Health and Safety perspective, it is not expected that the BESS will pose any significant fire, explosion or release of toxic gas risks. Nevertheless, risks are possible especially if there is mismanagement or abuse of the equipment. The following mitigation measures have been recommended:

- Ensure that adequate research is undertaken to select the supplier with the best technology and which has substantial environmental and safety mechanisms built in to the design of the BESS. Reputable suppliers that comply with the necessary legislation and regulations must be selected.
- Engage with a Risk Assessment specialist prior to construction to advise on any additional mitigation measures that need to be considered from a fire, explosion or release of toxic gas perspective.
- Ensure that the responsibilities of the various parties are defined clearly for the life cycle of the BESS, such as when the BESS is being transported to site, when it reaches site, during operations, during transport off site in the event of malfunction or any technical issues.
- Adhere to the appropriate international standards and South African National Standards (SANS) requirements in terms of the assembly and operation of the BESS.
- Ensure that the BESS is assembled and operated in line with the specifications of the supplier or manufacturer.
- Ensure that the BESS is located in a clearly demarcated area in order to prevent unnecessary access.
- Ensure that the operational staff are trained on the risks associated with fire, explosion and release of toxic gas, and how to react under these situations.
- Ensure that the contact details for the supplier of the BESS is kept readily available and sign-posted on site, should they need to be contacted during emergency situations.
- Ensure that the contact details of the local municipality and emergency response officials are kept on file and clearly sign-posted on site.
- A fire management plan must be compiled and implemented during the construction, operational and decommissioning phases, which must include an action plan for fires and emergency response specifically relating to the BESS.
- To ensure the safety of the workers, appropriate Personal Protective Equipment (PPE) (appropriate gloves, safety glasses/face shield, appropriate clothing) should be worn in the vicinity of the BESS.

Spillage of electrolytes:

The spillage of electrolytes is not identified as a significant impact because of the type of BESS being considered. As noted above, a lithium-ion BESS is being proposed as part of the proposed project. Lithium-ion BESS's do not require any above ground storage tanks for the storage and blending of electrolytes. The lithium-ion BESS is instead a fully integrated and sealed system; and the chances of spilled electrolytes are very remote if the BESS is assembled and operated in line with the relevant specifications of the manufacturer or supplier, especially from a Health and Safety perspective. The BESS will be remained sealed during operations. Nevertheless, risks are possible especially if there is mismanagement or abuse of the equipment. The following mitigation measures have been recommended:

- Ensure that adequate research is undertaken to select the supplier with the best technology and which has substantial environmental and safety mechanisms built in to the design of the BESS. Reputable suppliers that comply with the necessary legislation and regulations must be selected.

- Ensure that the responsibilities of the various parties are defined clearly for the life cycle of the BESS, such as when the BESS is being transported to site, when it reaches site, during operations, during transport off site in the event of malfunction or any technical issues.
- Adhere to the appropriate international standards and SANS requirements in terms of the assembly and operation of the BESS.
- Ensure that the BESS is assembled and operated in line with the specifications of the supplier or manufacturer.
- Ensure that the BESS is located in a clearly demarcated area in order to prevent unnecessary access.
- Ensure that the operational staff are trained on the risks associated potential spillages, and how to react under these situations.
- Ensure that the contact details for the supplier of the BESS are kept readily available and sign-posted on site, should they need to be contacted during emergency situations.
- Ensure that the contact details of the local municipality and emergency response officials are kept on file and clearly sign-posted on site.
- To ensure the safety of the workers, appropriate PPE (appropriate gloves, safety glasses/face shield, appropriate clothing) should be worn in the vicinity of the BESS.
- Ensure that the BESS is placed on an impermeable surface (e.g. concrete surface) which has adequate containment mechanisms to collect contaminated storm water.
- Any spill or leakage from the BESS must be attended to and cleaned immediately and must be disposed of at an appropriate licensed waste disposal facility. Waybills must be obtained and retained on file.
- The Project Applicant must develop a Spill Contingency Plan and Emergency Response Action Plan that deals with all potential spills and emergency response, specifically relating to the BESS.

Waste Generation:

The BESS will be fully pre-assembled off site and transported to site for placement. There will be no maintenance of the BESS on site. If there are any mechanical or technical issues with the BESS, it will not be fixed on site; and it will instead be disconnected from the system, and replaced. Usually, the operational lifespan of the BESS is aligned with that of the WEF. If the BESS needs to be replaced during the operational lifespan, it will be removed and disassembled and recycled offsite by the respective BESS supplier in line with relevant regulations. Therefore, waste generation as a result of the BESS assembly and operation is regarded as insignificant. Nevertheless, risks are possible and the following mitigation measures have been recommended:

- Ensure that the responsibilities of the various parties are defined clearly for the life cycle of the BESS, such as when the BESS is being transported to site, when it reaches site, during operations, during transport off site in the event of malfunction or any technical issues.
- Ensure that the BESS is dissembled in line with the specifications of the supplier or manufacturer.
- Ensure that the contact details for the supplier of the BESS are kept readily available and sign-posted on site, should they need to be contacted during emergency situation.
- Used batteries must be transported off site inside containers via suitable vehicles by the supplier of the BESS.
- The transport vehicle should be designated with relevant health and safety symbols.
- A set of equipment necessary to combat any spillage or leakage should be provided and the transport team trained on how to use it.
- Ensure that there is no maintenance of the BESS on site; and that old BESS's are removed from the site by the supplier or manufacturer.

- Ensure that adequate measures are put in place to verify that the pre-assembled BESS is in good working order before it gets transported to site to prevent any unnecessary risks.

D.2.15 Environmental Sensitivity Mapping

Based on the impact assessment undertaken and the relevant environmental sensitivities identified, the preferred site layout of the Komas WEF has been identified and shown in Figure D.13 and Appendix A.2 of this BA Report.

The direct footprint impacts from the proposed Komas WEF on various biodiversity features applicable offset ratios, and final offset requirements are indicated in the table below.

Feature impacted by Komas	*Area (ha)*	*add 5%*	*Total (ha)*	*Ratio*	*Offset (ha)*
Namaqualand Strandveld	79	4	83		
- of which NNP Expansion Footprint	30	2	32	1:20	
- CBA2 (overlaps entirely with above)	31	2	33	1:20	660
- ESA	28	2	30	1:5	150
Total area of offset					**810**

Based on the specialist studies, the key environmental features that have been avoided in terms of the layout of the facility are listed below:

- **Terrestrial Biodiversity**
    - Based on the Northern Cape CBA map, the southern parts of the proposed Komas WEF site lie within a Tier 2 CBA with a small portion of Tier 1 CBA in the south-eastern corner of the site (Figure D.6). This indicates that the site occurs within an area of recognised biodiversity significance.
    - The CBA 1 in the south-eastern corner of the site must be excluded. Under the final layout assessed, there are no turbines or other infrastructure proposed within the CBA 1.
    - The low-lying area in the far west of the site consisting of short Strandveld on calcareous soils is considered to represent the most sensitive part of the site from an ecological perspective and is not considered suitable for development. This area is excluded from the proposed development of the Komas WEF.
    - There are also some areas of mobile dunes and rocky outcrops which should also be avoided (as has been achieved under the final layout).

Refer to Figure D.6 of the Terrestrial Biodiversity Impact Assessment for the ecology sensitivity map.

The loss of 31 ha of habitat within the CBA 2 represents less than 2% of the area of CBA within the proposed Komas WEF study area only and significantly less of the whole affected CBA. As a result, this is highly unlikely to compromise the ecological functioning of the CBA, given that it has not been identified as being of particular significance for broad-scale ecological processes. Consequently, the overall impact of the development on CBAs and broader scale ecological processes is considered to be relatively low and no major impacts to dispersal ability or faunal movement patterns are likely to be generated by the development.

- **Aquatic Biodiversity**
  - No watercourses were encountered within the Komas WEF study area. Therefore, no aquatic features need to be avoided by the proposed development of the Komas WEF and associated infrastructure.

The Aquatic Biodiversity Compliance Statement that was undertaken rates the aquatic sensitivity to be of very low sensitivity. Therefore, the rating of very high significance as identified by the National Web-Based Environmental Screening Tool is disputed based on the evidence collected during the site visit and as motivated in Aquatic Compliance Statement (Appendix C.2 of this BA Report).

- **Avifauna**

  - **Very High sensitivity or No-Go areas**: The Avifauna Impact Assessment (Appendix C.3) did not identify **areas of Very High sensitivity or No-Go areas within the proposed Komas WEF site.**

  - **High-risk**: The Avifauna Impact Assessment notes that there were no areas observed during the 12-month pre-construction avifauna monitoring where two Red Data species overlapped or where numerous flights of any one Red Data species occurred. Where this occurred for Ludwig's Bustards the specialist down-graded them to medium-risk (indicated below) because in the Komas site they never flew within the BSA. **Therefore, no high-risk areas were identified within the proposed Komas WEF site.**

  - **Medium-risk:** Five areas arose within the proposed Komas WEF site from the overlap of two or more non-threatened priority species, particularly the Black-chested Snake Eagles and Booted Eagles. Areas where a low frequency of flights of Red Data Verreaux's Eagles or Ludwig's Bustards occurred were included as medium-risk areas as these Red Data species were either infrequently recorded (the eagles) or were never recorded flying in the BSA (Ludwig's Bustard). Turbines are allowed to be placed within the medium-risk areas.

Refer to Figure D.7 for the avifauna sensitivity map.

- **Bats**

  - **Very High sensitivity or No-Go areas**:

The following features, which could be bat conducive, either at present, or in future, have been buffered with a 200 m buffer at the proposed Komas WEF site. If two or more points of interest are in close vicinity, they are linked to form one sensitivity zone:

- Open water sources, such as water troughs for livestock. Some of these are historic, but could be used in future;
- Reservoirs;
- Dams;
- Diggings; and
- Pans.

In the southern area of the proposed Komas WEF site crevices were discovered with some bat rests, indicating bat presence in the area. Although no bats have been physically observed, these could serve as roosts. The static recorder situated in the south also recorded the highest bat activity if

compared to the other monitoring systems on site. The contour of the hilly area in the south, also indicating the border of the proposed Komas WEF site, were followed to create this high sensitivity zone. This area has been excluded from the proposed development of the Komas WEF.

- **Medium to high sensitivity zones**: The Bat Impact Assessment (Appendix D.4) notes that initially this zone was classified as of medium sensitivity, but when hourly mean bat activity was calculated taking all monitoring data into account, it was clear that bat activity is higher than the threshold provided by the South African Good Practice Guidelines for Surveying Bats at Wind Energy Facility Developments – Pre-construction (Sowler et. al, 2017). It seems as if Namaqualand Salt Pans vegetation zone (SANBI, 2012), supports higher bat presence, and the border of this vegetation zone had been used for the sensitivity zone. Due to the high bat activity, if taking the threshold into account, the medium zone was changed to a medium to high sensitivity zone.

- **Medium sensitivity zone:** The remaining part of the site was initially classified as of Low sensitivity, but when data from the static recorders were considered, the rest of the site was changed to a medium sensitivity zone.

Refer to Figure D.8 for the bat sensitivity map.

- **Visual**

  - **No-Go areas:** The following No-Go areas have been avoided by the proposed layout of the Komas WEF (access roads are permissible in these areas):
    - Topographic features: Feature
    - Steep slopes: Slopes > 1:4
    - Ridges: Ridges within the proposed Komas WEF development area should be precluded from the development footprint.
    - Farmsteads: 500 m exclusion zone should be placed around any farmstead located on, or within 500 m of the proposed Komas WEF development area.
    - Arterial routes: within 250 m

Two turbines are located in an area demarcated as "Very High Sensitivity: Ridges", however the VIA report notes that these are not No-Go areas and do not preclude development but rather should be viewed as zones where the number of turbines should be limited where possible.

Refer to Figure D.9 for the visual sensitivity map.

- **Heritage (Archaeology and Cultural Landscape)**

  - **Very High sensitivity or No-Go areas:** The archaeological sites as identified in Figures 27 and 29 of the HIA (Appendix C.6 of this BA Report) should be avoided with a 50 m buffer. The proposed Komas WEF are situated outside of these buffer areas.

Refer to Figure D.10 for the heritage sensitivity map.

- **Palaeontology**
    - There are no specific fossil sites that must be avoided by the proposed Komas WEF development.
- **Agriculture**
    - The agricultural protocol requires confirmation that all reasonable measures have been taken through micro-siting to minimize fragmentation and disturbance of agricultural activities. However, the agricultural uniformity and low agricultural potential of the environment, means that the exact positions of all infrastructure will make no material difference to agricultural impacts. Therefore, no areas of very high or high agricultural potential were identified on the proposed Komas WEF site.
- **Socio-Economic**
    - Sensitivity maps in terms of areas to avoid are not applicable for the Socio-Economic Assessment.
- **Noise**
    - **Very High sensitivity or No-Go areas**: 500 m from NSDs. The Noise Assessment (Appendix C.9 of the BA report) confirms that there are no potential NSDs within 500 m from any proposed wind turbines.
- **Traffic**
    - Sensitivity maps in terms of areas to avoid are not applicable for the Transport Impact Assessment.
- **Geotechnical**
    - Sensitivity maps in terms of areas to avoid are not applicable for the Geotechnical Impact Assessment.

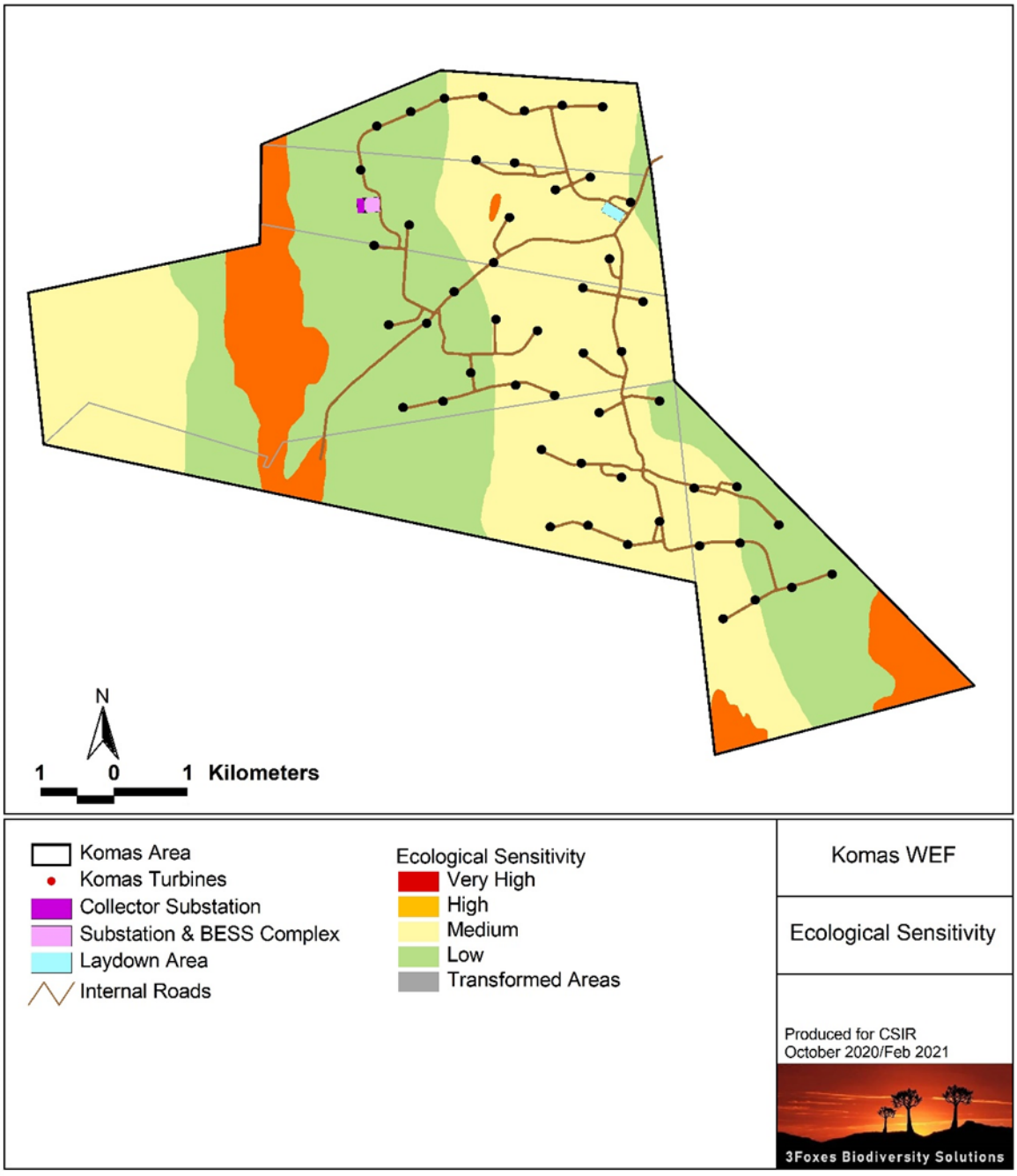


Figure D.6: Sensitivity Map for Terrestrial Biodiversity at the proposed Komas WEF site.

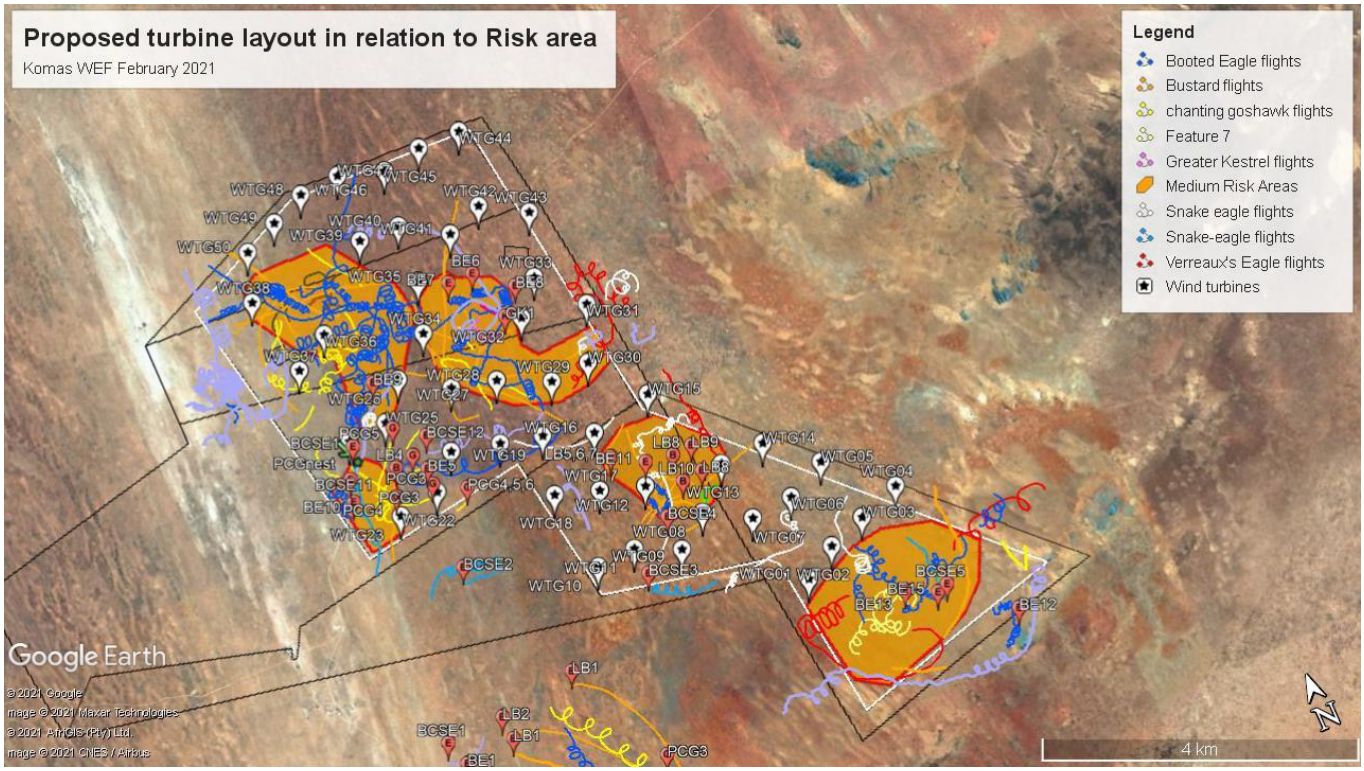


Figure D.7: Sensitivity Map for Avifauna at the proposed Komas WEF site.

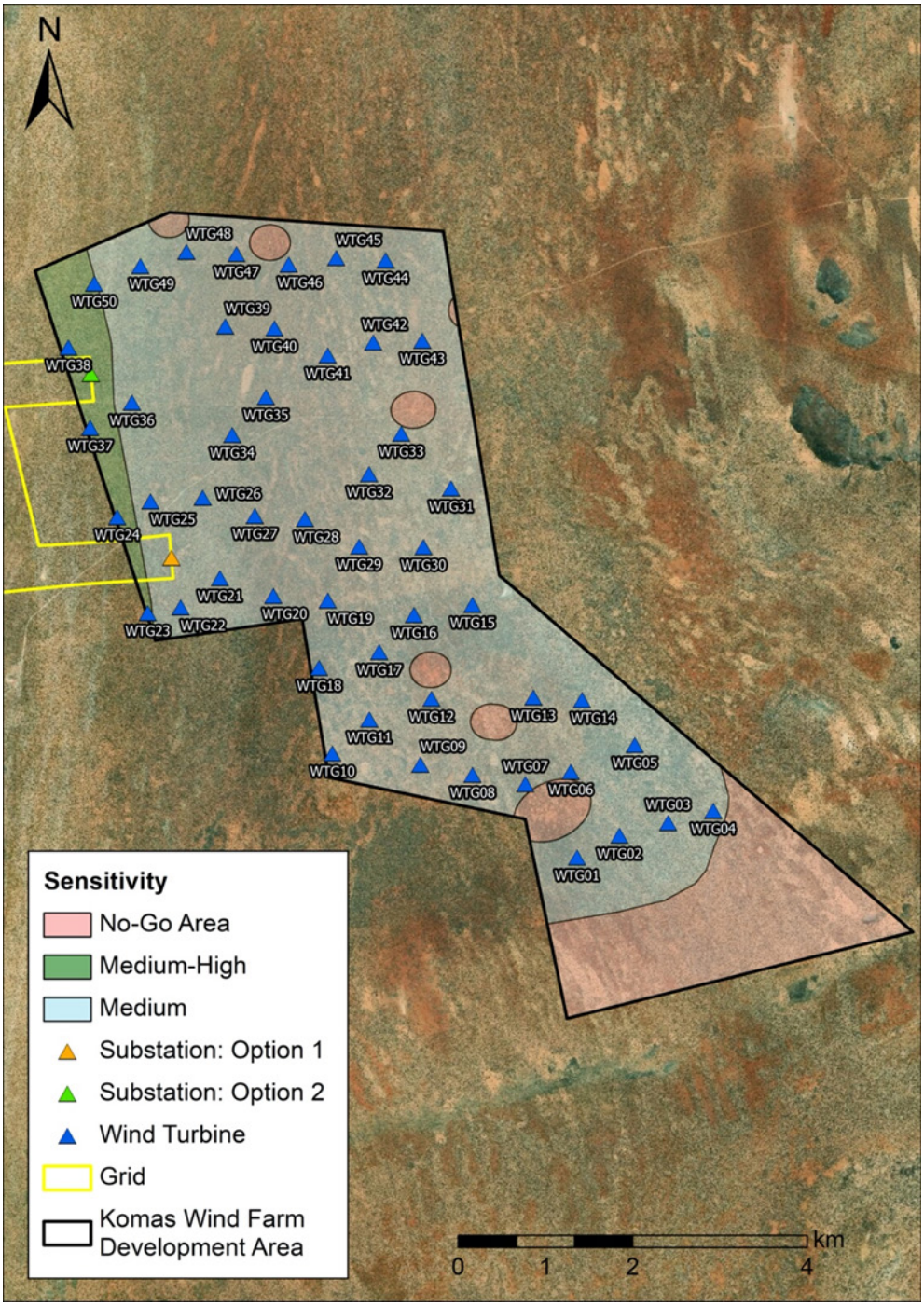


Figure D.8: Sensitivity Map for Bats at the proposed Komas WEF site.

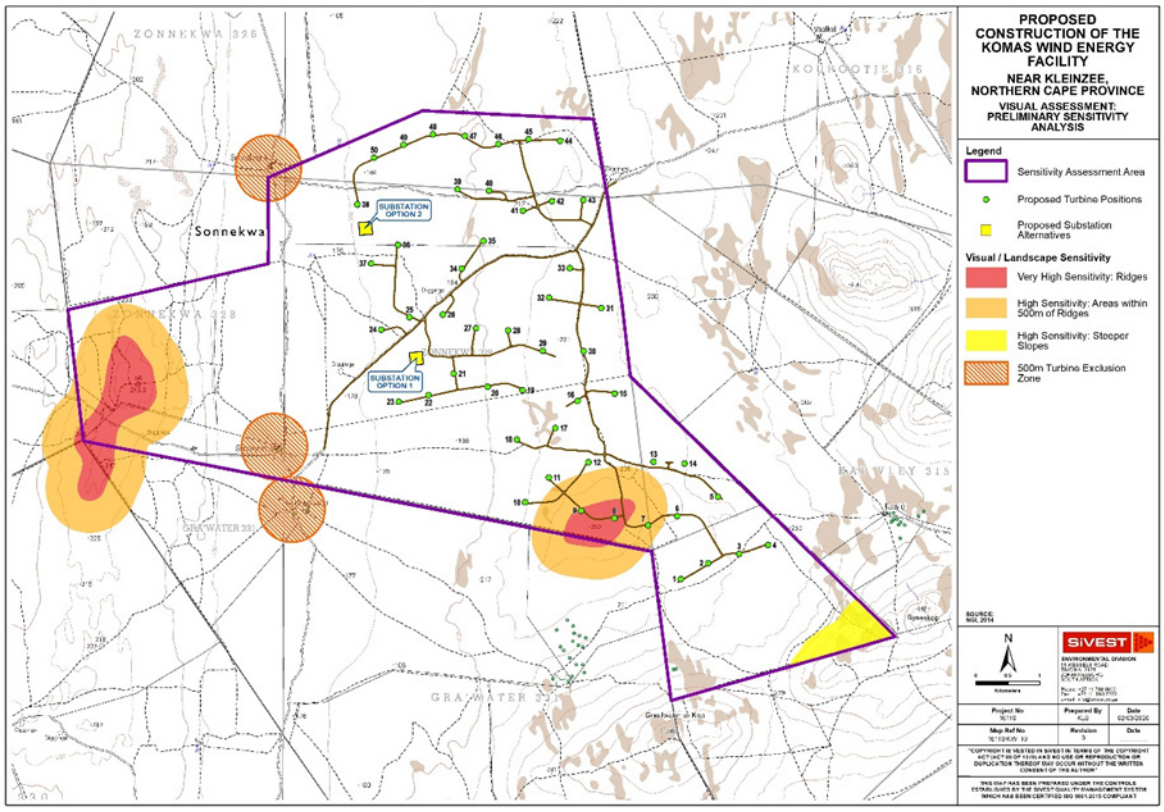


Figure D.9: Sensitivity Map for Visual Aspects: Visual sensitivity analysis at the proposed Komas WEF site.

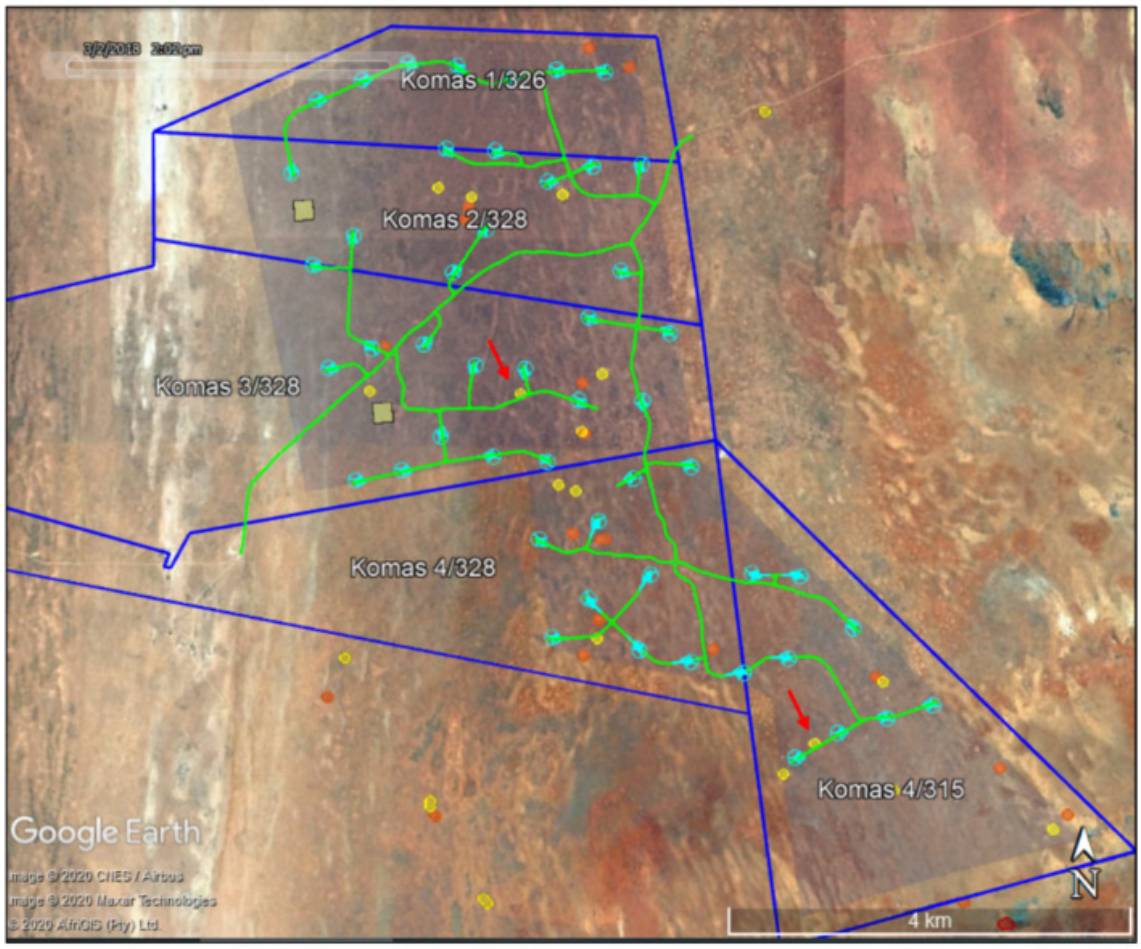


Figure D.10. Sensitivity Map for Heritage at the proposed Komas WEF site: Aerial view of the Komas study area showing the distribution of archaeological sites by grade and including their buffers. Orange = GPB, yellow = GPC. [12]All waypoints are buffered by 50 m which allows for the size of the site plus at least a 30 m buffer. The proposed Komas WEF components are shown by green lines (roads) and turquoise symbols (turbines). The two locations where buffers are intersected are highlighted by red arrows.

[12] The archaeological resources on site are deemed to have low-medium cultural significance for their scientific value. Those more important sites are assigned a field rating of 'GPB', but many others are considered to be 'GPC'. No archaeological sites were rated 'GPA'.

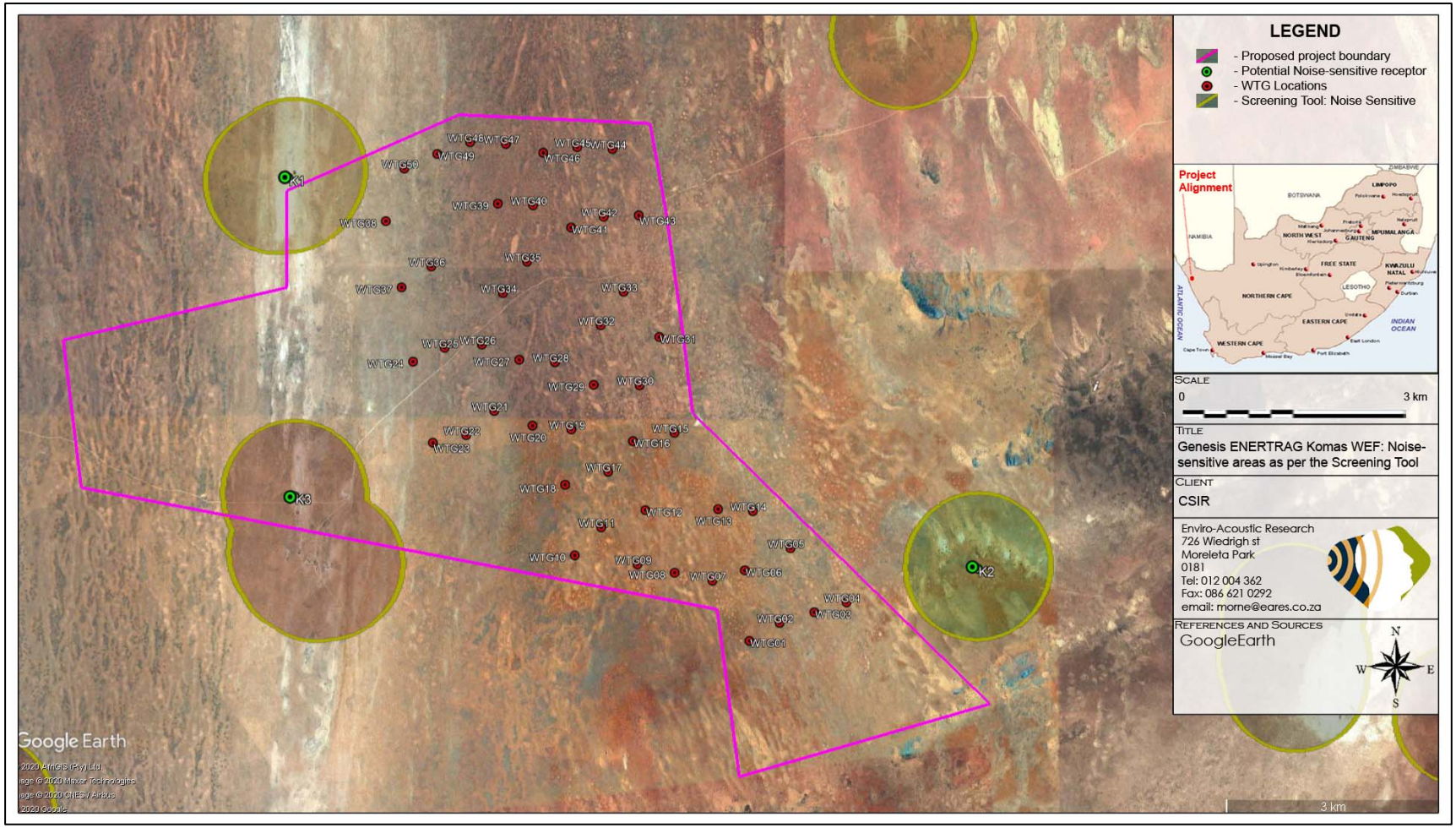


Figure D.11. Sensitivity Map for Noise at the proposed Komas WEF site: indicating closest identified Noise Sensitive Developments

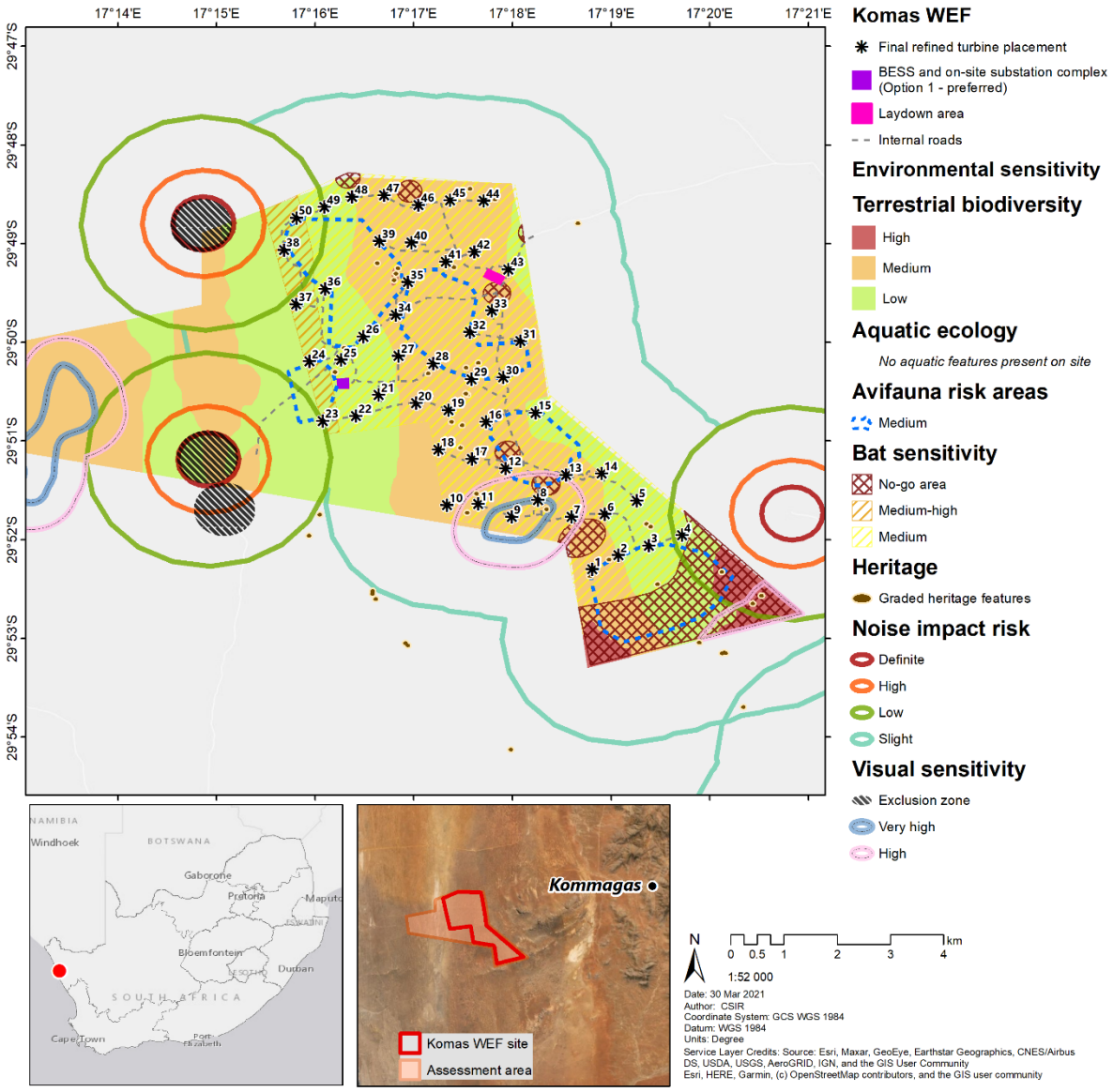


Figure D.12. Combined Sensitivity Map for the proposed Komas WEF project

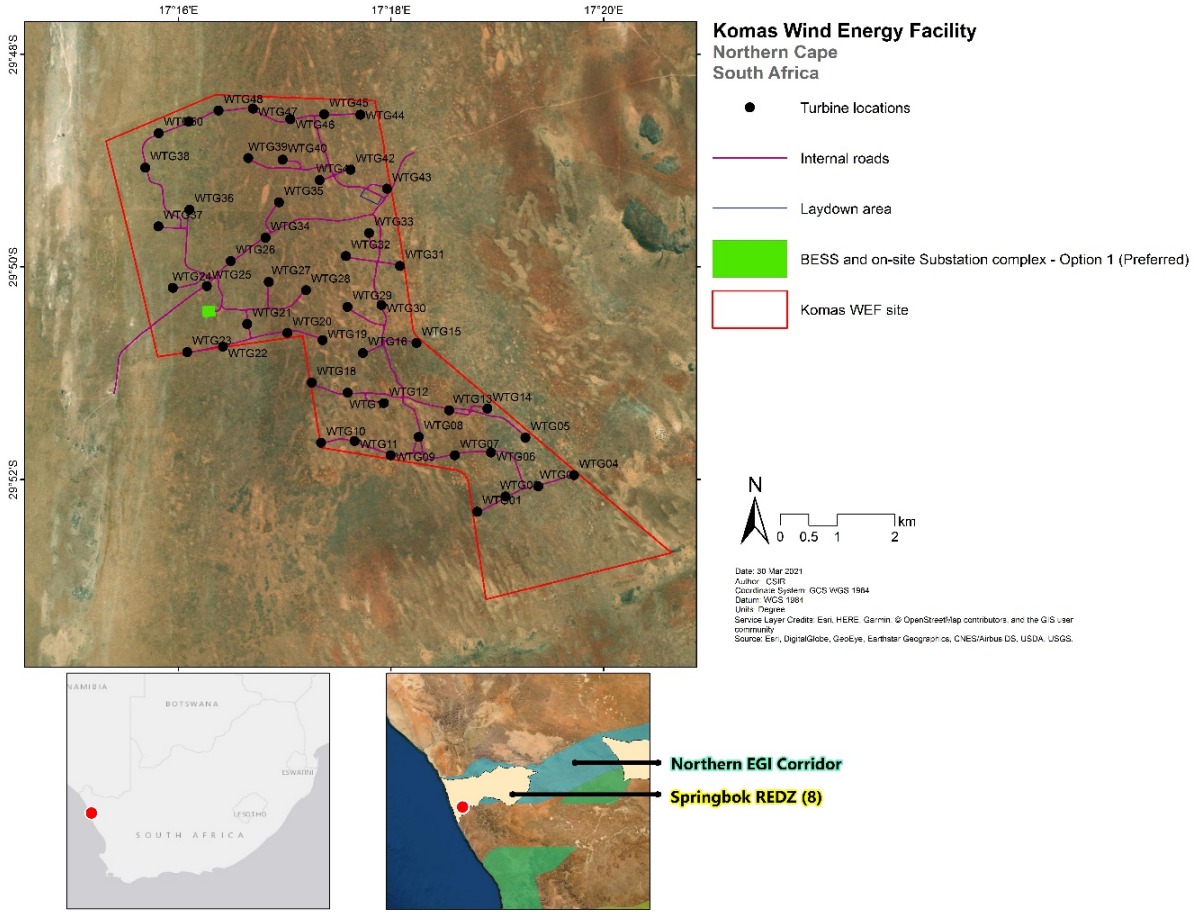


Figure D.13. Preferred layout for the proposed Komas WEF project and associated infrastructure

SECTION E: RECOMMENDATION OF ENVIRONMENTAL ASSESSMENT PRACTITIONER & ENVIRONMENTAL IMPACT STATEMENT

This BA Report has investigated and assessed the significance of potential positive and negative direct, indirect and cumulative impacts associated with the proposed construction, operation and decommissioning of the proposed Komas WEF and associated infrastructure**.** No negative impacts have been identified within this BA that, in the opinion of the EAP who has conducted this BA process, should be considered "fatal flaws" from an environmental perspective, and thereby necessitate substantial re-design or termination of the project.

Section 24 of the Constitutional Act states that "everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures, that prevents pollution and ecological degradation; promotes conservation; and secures ecologically sustainable development and use of natural resources while promoting justifiable economic and social development". Based on this, this BA was undertaken to ensure that these principles are met through the inclusion of appropriate management and mitigation measures, and monitoring requirements. These measures will be undertaken to promote conservation by avoiding the sensitive environmental features present on site and through appropriate monitoring and management plans (refer to the EMPrs in Appendix G of this BA Report).

It is understood that the information contained in this BA Report and appendices is sufficient to make a decision in respect of the activity applied for. It is recommended that the EA be valid for a period of 10 years.

Alternatives

As noted above, in Section A of this report, the preferred activity was determined to be the development of a renewable energy facility on site using wind energy as the preferred technology. In terms of the preferred location of the site, even though location alternatives were not assessed the layout was designed after provision of sensitivity data by the specialists to ensure that it would have the least possible overall environmental impact. The land assessed to develop the proposed Komas WEF extends approximately 5 070 ha. The area identified for the proposed Komas WEF site within the affected farms is approximately 2 725 ha. However, the footprint of the proposed Komas WEF within the WEF site is only approximately 90 ha (excluding access roads to the site).

The specialists identified No-Go and areas of very high sensitivity within the 2 725 ha which have been excluded from the current layout. The specialists considered desktop data, field work, existing literature and the National Web-based Environmental Screening Tool to inform the identification of sensitivities at the proposed Komas WEF site. The location and preferred layout of the proposed Komas WEF project have been informed by the outcomes of the specialist assessments and technical feasibility, as well as landowner requirements. The initial layout went through several iterations to avoid No-Go or areas of higher environmental sensitivity. The preferred layout is therefore a

culmination of all the specialist inputs and outcomes to ensure that the proposed Komas WEF footprint avoids all No-Go areas and that the project is developed in an environmentally sustainable manner. Based on this a sensitivity map was compiled (Figure D.12) and a preferred layout was subsequently determined for the Komas WEF and associated infrastructure (Figure D.13 and Appendix A.2 of this BA Report). This layout avoids the features on site that have been identified as No-Go areas, as explained in Section B and Section D. The layout will still need to be micro-sited (the turbines and access roads) prior to the commencement of construction. This micro-siting will be informed by *inter alia* a pre-construction walk-through of the development footprint to further refine the layout and further reduce impacts on SCC.

The Project Applicant provided two site alternatives for assessment for the BESS and on-site SS complex, i.e. Option 1 and Option 2. Both alternatives are deemed feasible by all the specialists and can be implemented (see Table E.1). However, the preferred alternative selected by the Project Applicant is Option 1 as the site is in an optimal location in relation to the proposed turbine layout (see Figure D.13). The Visual specialist also confirmed that Option 1 is their preferred alternative as Option 2 is closer to the nearest receptor.

Table E.1. Assessment of BESS and on-site SS complex alternatives (Option 1 and Option 2) by the specialists

	Preferred		No Preference		Favourable

	Option 1	**Option 2**
Terrestrial Biodiversity	✓	✓
Aquatic Biodiversity	✓	✓
Avifauna	✓	✓
Bats	✓	✓
Visual	✓	✓
Heritage (including Archaeology, Cultural Landscape and Palaeontology)	✓	✓
Socio-Economic	✓	✓
Agriculture	✓	✓
Noise	✓	✓
Transport	✓	✓
Geotechnical	✓	✓

Need and Desirability of the Proposed Project

This BA considered the nature, scale and location of the proposed development as well as the wise use of land (i.e. is this the right time and place for the development of the proposed Komas WEF project). This proposed project is located in the Springbok REDZ (REDZ 8) which is a geographical area that has been identified on a strategic planning level to have reduced negative environmental

impacts but high commercial attractiveness (due to its proximity to, *inter alia*, the national grid) and socio-economic benefit to the country. The proposed Komas WEF is therefore aligned with national planning initiatives for the placement of WEFs in South Africa. The development of a WEF is important for South Africa to reduce its overall environmental footprint from coal power generation (including externality costs), and thereby to steer the country on a pathway towards sustainability.

On a municipal planning level, the proposed project supports the objectives of the NDM's IDP (2017-2022) which state that an opportunity exists to utilise wind energy more widely and lessen the dependence on wood and gas as energy sources for cooking in households. This opportunity has been identified because of the increasing backlog in electricity provisioning in the municipal area. Even though this WEF will not supply electricity directly to the local or district municipality, the energy produced by the proposed Komas WEF will feed into the national grid.

The IDP has also identified embarking on renewable energy and upgrading electricity supply to water pump stations and incorporation of Eskom electricity network to address the electricity needs in the Komaggas area; this depicts a need for an alternative source of energy.

One of the economic priority issues identified within the NDM IDP (2017– 2022) is the high levels of unemployment. The IDP further states that the majority of the adult population within the NKLM have low skills levels and need employment. The proposed project will create job opportunities, undertake skills training and create economic spin offs during the construction and operational phases (if an EA is granted by the DEFF). It is difficult to specify the actual number of employment opportunities that will be created at this stage; however approximately 200 – 250 employment opportunities are expected to be created during the construction phase. It is anticipated that approximately 55% (136) of the employment opportunities will be available to low skilled workers (construction labourers, security staff etc.), 30% (76) to semi-skilled workers (drivers, equipment operators etc.) and 15% (38) for skilled personnel (engineers, land surveyors, project managers etc.).

The projected operations are expected to provide several services and added economic spin offs (as highlighted in Section D of this BA Report). Approximately 20 permanent employment opportunities (skilled and unskilled) will be created during the operational phase of the project. Of this total, approximately 12 will be low skilled workers, 6 semi-skilled and 2 skilled workers.

The **proposed Komas WEF project is therefore** aligned with the vision and goals of the District and Local Municipality.

Summary of Key Impact Assessment Findings

Based on the findings of the specialist studies, the proposed project is considered to have an overall low negative environmental impact and an overall low to moderate positive socio-economic impact (with the implementation of respective mitigation and enhancement measures). Table E.2 below provides a summary of the impact assessment for each phase of the proposed project **post mitigation for direct impacts**. Table E.3 provides the same information for the **cumulative impacts**.

As indicated in Table S.4, it is clear that the majority of the **direct negative impacts** were rated with a **low to very low post mitigation impact significance** for the **construction phase**, with only the Avifauna, Cultural Landscape and Transport impacts being rated with a **moderate significance**. In terms of the operational phase, the majority of the **direct negative impacts** were rated with a **low post mitigation impact significance**, with only the Avifauna, Bats and Visual impacts being rated with a **moderate significance**. The majority of the **direct negative impacts** for the decommissioning phase were rated with a **low post mitigation impact significance**, with only the Avifauna, Heritage

(Archaeology and Cultural Landscape) and Transport impacts being rated with a **moderate significance.** In terms of **positive impacts**, the Socio-Economic impacts are rated as of **moderate significance** for the construction phase; and **moderate to high** for the operational phase.

Based on Table E.3, the majority of the **cumulative negative impacts** were rated with a **low post mitigation impact significance** for the **construction phase**, with only the Heritage (Cultural Landscape) and Transport impacts being rated with a **moderate significance**. The majority of the impacts for the **operational phase** are rated as **insignificant to low significance**, with visual and Heritage (Archaeology and Cultural Landscape) impacts being rated with a **moderate significance, and Avifauna and Bats** rated as **high significance**. During the decommissioning phase, cumulative impacts were not identified and/or were considered insignificant, however for those that were rated, it resulted in an overall **neutral and very low post mitigation impact significance**. In terms of **positive impacts**, the Socio-Economic impacts are rated with a **moderate significance** and Palaeontology impacts are rated with a low significance for the construction phase. For the operational phase, the Socio-Economic impacts are rated with a **moderate to high significance** and the Agriculture impacts are rated with a **low significance**.

Table E.2. Overall Impact Significance with the Implementation of Mitigation Measures for Direct Negative and Positive Impacts for the Komas WEF Project

Specialist Assessment	Construction Phase	Operational Phase	Decommissioning Phase
DIRECT NEGATIVE IMPACTS			
Terrestrial Biodiversity	**Low**	**Low**	**Low**
Aquatic Biodiversity	**Low**	**Low**	**Low**
Avifauna	**Moderate**	**Moderate**	**Moderate**
Bats	**Low**	**Moderate**	**Very Low**
Visual	**Low**	**Moderate**	**Low**
Heritage (Archaeology and Cultural Landscape)	**Archaeology and graves: Very Low** **Cultural Landscape: Moderate**	**Low**	**Moderate**
Palaeontology	**Low**	**Insignificant and/or not identified and/or not applicable (N/A)**	**Insignificant and/or not identified and/or N/A**
Agriculture	**Low**	**N/A**	**Low**
Socio-Economic	**Low**	**Low**	**Low**
Noise	**Very Low**	**Very Low** **Low**	**Very Low**
Transport	**Moderate**	**Insignificant**	**Moderate**
Geotechnical	**Very Low**	**No impacts identified**	**Very Low**
DIRECT POSITIVE IMPACTS			

Specialist Assessment	Construction Phase	Operational Phase	Decommissioning Phase
Agriculture	**Not applicable**	**Low (+)**	**Not applicable**
Palaeontology	**Low (+)**	**Insignificant and/or not identified and/or N/A**	**Insignificant and/or not identified and/or N/A**
Socio-Economic	**Moderate (+)**	**Moderate (+)** **High (+)**	**N/A**

Table E.3. Overall Impact Significance with the Implementation of Mitigation Measures for Cumulative Negative and Positive Impacts for the Komas WEF Project

Specialist Assessment	Construction Phase	Operational Phase	Decommissioning Phase
CUMULATIVE NEGATIVE IMPACTS			
Terrestrial Biodiversity	**Low**	**Low**	**Neutral**
Aquatic Biodiversity	**N/A**	**N/A**	**N/A**
Avifauna	**Insignificant and/or not identified and/or N/A**	**High**	**Insignificant and/or not identified and/or N/A**
Bats	**Low**	**Low** **High**	**Insignificant and/or not identified and/or N/A**
Visual	**Low**	**Moderate**	**Insignificant and/or not identified and/or N/A**
Heritage (Archaeology and Cultural Landscape)	**Archaeology and graves: Very Low** **Cultural Landscape: Moderate**	**Moderate**	**Insignificant and/or not identified and/or N/A**
Palaeontology	**Low**	**Insignificant and/or not identified and/or N/A**	**Insignificant and/or not identified and/or N/A**
Agriculture	**Very Low**	**Insignificant and/or not identified and/or N/A**	**Insignificant and/or not identified and/or N/A**
Socio-Economic	**Low**	**Low**	**Insignificant and/or not identified and/or N/A**
Noise	**Insignificant and/or not identified and/or N/A**	**Very Low**	**Insignificant and/or not identified and/or N/A**
Transport	**Moderate**	**Insignificant**	**Insignificant**
Geotechnical	**Very Low**	**Very Low**	**Very Low**

CUMULATIVE POSITIVE IMPACTS			
Palaeontology	**Low (+)**	**Insignificant and/or not identified and/or N/A**	**Insignificant and/or not identified and/or N/A**
Agriculture	**N/A**	**Low (+)**	**N/A**
Socio-Economic	**Moderate (+)**	**Moderate (+)**	**Insignificant and/or not identified and/or N/A**
		High (+)	

All of the specialists have recommended that the proposed project receives EA, if the recommended mitigation measures are implemented.

Overall Environmental Impact Statement

Taking into consideration the findings of the BA process, as well as the fact that the proposed **Komas WEF project** will be located within the Springbok REDZ (REDZ 8), it is the opinion of the EAP, that the project benefits outweigh the costs and that the project will make a positive contribution to sustainable infrastructure development in the NKLM and the NDM area. **Provided that the specified mitigation measures are applied effectively, it is recommended that the proposed project receives EA in terms of the NEMA EIA Regulations, 2014, as amended.**

Cumulative Environmental Impact Statement

The cumulative impacts have been assessed by all the specialists on the project team. The cumulative assessment included approved renewable energy projects (wind and solar PV) within a 50 km radius of the proposed Komas WEF project site, as well as renewable energy projects which have submitted an application for EA with the competent authority at the time when the project was commissioned. A BA process will also likely be conducted for the proposed Gromis WEF and the cumulative impacts of this project were also considered in the cumulative assessment. No cumulative impacts have been identified that were considered to be fatal flaws. The specialists recommended that the project receives EA in terms of the NEMA EIA Regulations, 2014, as amended, including consideration of cumulative impacts. It is also important to note that the proposed project site is located within the Springbok REDZ (REDZ 8) which supports the development of large scale wind and solar energy developments. The proposed project is therefore aligned with the national planning vision for wind and solar development in South Africa.

Conditions to be included in the EA

In order to ensure the effective implementation of the mitigation and management actions, a draft EMPr has been compiled and is included in Appendix G of this BA Report. The mitigation measures necessary to ensure that the proposed project is planned and carried out in an environmentally responsible manner are listed in these draft EMPrs. The EMPrs includes the mitigation measures noted in this report and the specialist studies. The EMPrs are dynamic documents that should be updated as required and provide clear and implementable measures for the proposed project.

Listed below are the **main** recommendations that should be considered for inclusion in the EA (should such authorisation be granted by the DEFF). These main recommendations as well as additional recommendations are included in the EMPrs and BA Report.

- **Terrestrial Biodiversity Impacts**

  - Construction Phase:

    Vegetation and Plant Species of Conservation Concern:

    - No development of turbines, roads or other infrastructure within No-Go areas identified in Figures D.6 and D.12 in Section D of the BA report.
    - Pre-construction walk-through of the development footprint to further refine the layout and reduce impacts on SCC through micro-siting of the turbines and access roads.
    - Demarcate all areas to be cleared with construction tape or other appropriate and effective means. However, caution should be exercised to avoid using material that might entangle fauna.

    Fauna

    - Avoidance of identified areas of high faunal importance at the design stage.
    - Ensure that laydown areas and other temporary infrastructure is located within medium- or low- sensitivity areas (as identified in Figure D.6 in Section D of the BA report), preferably previously transformed areas if possible.
    - Search and rescue for reptiles and other vulnerable species during construction, before areas are cleared.
    - During construction any fauna directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person.
    - Limit access to the site and ensure that construction staff and machinery remain within the demarcated construction areas during the construction phase.
    - Environmental induction for all staff and contractors on site.
    - All construction vehicles should adhere to a low speed limit (40 km/h for cars and 30 km/h for trucks) to avoid collisions with susceptible species such as snakes and tortoises and rabbits or hares. Speed limits should apply within the facility as well as on the public gravel access roads to the site.
    - If any parts of the site such as construction camps must be lit at night, this should be done with low-UV type lights (such as most LEDs) as far as practically possible, which do not attract insects and which should be directed downwards.

  - Operational Phase:

    Soil erosion

    - Erosion management at the site should take place according to the Erosion Management Plan and Rehabilitation Plan (included in the EMPrs in Appendix G of the BA report).
    - All roads and other hardened surfaces should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk.
    - Regular monitoring for erosion after construction to ensure that no erosion problems have developed as result of the disturbance, as per the Erosion Management and Rehabilitation Plans for the project.

- All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques.
- All cleared areas should be revegetated with indigenous perennial species from the local area.
- Avoid areas of high wind erosion vulnerability as much as possible.
- Use net barriers, geotextiles, active rehabilitation and other measures during and after construction to minimise sand movement at the site.

Alien plant invasion

- Alien management plan to be implemented during the operational phase of the development, which makes provision for regular alien clearing and monitoring.
- Wherever excavation is necessary, topsoil should be set aside and replaced after construction to encourage natural regeneration of the local indigenous species.
- Due to the disturbance at the site as well as the increased runoff generated by the hard infrastructure, alien plant species are likely to be a long-term problem at the site and a long-term control plan will need to be implemented. Problem woody species such as *Acacia cyclops* are already present in the area and are likely to increase rapidly if not controlled.
- Regular monitoring for alien plants within the development footprint as well as adjacent areas which receive runoff from the facility as there are also likely to be prone to invasion problems.
- Regular alien clearing should be conducted, as needed, using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.

Fauna

- Open space management plan for the development, which makes provision for favourable management of the facility and the surrounding area for fauna.
- Limiting access to the site to staff and contractors only.
- Appropriate design of roads and other infrastructure where appropriate to minimise faunal impacts and allow fauna to pass through or underneath these features.
- No electrical fencing within 20 cm of the ground as tortoises become stuck against such fences and are electrocuted to death.
- If the site must be lit at night for security purposes, this should be done with downward-directed low-UV type lights (such as most LEDs) as far as possible, which do not attract insects.
- All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.
- All vehicles accessing the site should adhere to a low speed limit (40 km/h max) to avoid collisions with susceptible species such as snakes and tortoises.

Critical Biodiversity Areas

- Minimise the development footprint as far as possible, which includes locating temporary-use areas such as construction camps and lay-down areas in previously disturbed areas.

- Avoid impact to restricted and specialised habitats such as pans or active dune fields.
- Implement a management plan for the site which takes cognisance of the ecological value of the area and is favourable for the maintenance of fauna and flora in the area.

- Decommissioning Phase:

Soil erosion

- All hard infrastructure should be removed and the footprint areas rehabilitated with locally-sourced perennial species.
- The use of net barriers, geotextiles, active rehabilitation and other measures after decommissioning to minimise sand movement and enhance revegetation at the site.
- Monitoring of rehabilitation success at the site for at least three years after decommissioning or until the rehabilitation benchmarks and criteria have been met.
- All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques.

Alien plant invasion

- Alien management plan to be implemented during the decommissioning phase of the development, which makes provision for regular alien clearing and monitoring for at least three years after decommissioning.
- Active rehabilitation and revegetation of previously disturbed areas with indigenous species selected from the local environment.
- Wherever excavation is necessary for decommissioning, topsoil should be set aside and replaced after decommissioning activities are complete to encourage natural regeneration of the local indigenous species.
- Due to the disturbance at the site alien plant species are likely to be a long-term problem at the site following decommissioning and regular control will need to be implemented until a cover of indigenous species has returned.
- Regular monitoring for alien plants within the disturbed areas for at least three years after decommissioning or until alien invasives are no longer a problem at the site.
- Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.

- **Terrestrial Biodiversity Offset**

Conditions to be included to the EA (should it be granted) as proposed in the Biodiversity Offset Report (February 2021) prepared by Mr. Mark Botha of Conservation Strategy, Tactics and Insight:

- **Condition 1:**

  The applicant must secure an area, in at least as good condition as the impact site, of at least 810 ha of Namaqualand Strandveld (or an adjacent and related vegetation type) as a protected area declared in perpetuity. This area must be

substantially within the Expansion Footprint of the Namaqua National Park, and where possible secure the most important areas of that footprint, or the Critical Biodiversity Areas as adopted for the Northern Cape, and be suitable for inclusion in the National Park in the medium term. The applicant is responsible for all costs related to its protection and management for a period of 30 years from commencement.

- **Condition 2:**

  The applicant may not commence with construction of the listed activity, until such time as suitable evidence of ability, intent and commitment to comply with the offset condition above has been submitted to this department. An implementation arrangement(s) or agreement(s) concluded with a suitable service provider(s) or organ of state, setting out as a minimum, the requisite offset outcomes, management requirements, roles and responsibilities, financial and institutional measures, and provisions for rectifying breaches of the agreement, is sufficient for this purpose.

- **Condition 3:**

  Should the applicant fail to satisfy this offset requirement, or be in un-rectified breach of the offset implementation agreement(s) referred to above for a period of greater than 1 year, then this authorisation will be automatically suspended.

- **Avifauna Impacts**

  - Avoid the medium-risk areas as identified in Figure 15 of the Avifauna Impact Assessment (Appendix C.2 of the BA Report) and in Figures D.7 and D.12 of Section D of the BA Report.
  - Conduct construction phase avifauna monitoring to monitor the effect of the construction itself on priority birds as per the recommendations of the Avifauna specialist/and or the latest .
  - Conduct post-construction avifauna monitoring according to the Best Practice Guidelines for assessing and monitoring the impacts of wind energy facilities in southern Africa, produced by BirdLife South Africa and the Endangered Wildlife Trust (Jenkins et al. 2015) or later versions of the guidelines valid at the time of monitoring, as well as other relevant South African guidelines as applicable during the monitoring period.

- **Bat Impacts**

  - The final layout should adhere to the sensitivity map, as provided in Section 7 of the Bat Impact Assessment (Appendix C.4) and in Figures D.8 and D.12 of Section D of this BA report.
  - Apart from mitigation by turbine placement, freewheeling should be prevented to an extent that bat mortality is avoided below cut-in speed, and feathering applied to all turbine blades during periods when no power is generated for the duration of the project to prevent bat mortality.

- A mitigation scheme will be required for turbines situated within the medium to high sensitivity zone, as indicated in table below (A), which should be implemented when the turbines start to turn. Please also refer to Table 7 in Section 9.2 of the Bat Impact Assessment Report (Appendix C.4 of this BA Report). If the number of turbines are reduced, the developer could consult with the operational bat specialist as to whether curtailment could also be reduced, after more data becomes available.
- Further mitigation measures, if necessary, are indicated in the second table below (B) and should be applied and adapted by the bat specialist to be appointed at the start of the operational phase, as required. Please also refer to Table 8 in Section 9.2 of the Bat Impact Assessment Report (Appendix C.4 of this BA Report).
- Mitigation measures in the EMPr (Appendix G of the BA report) must be adhered to.
- A minimum of two years' operational bat monitoring as per the latest Best Practice Guidelines (Sowler et al., 2017) of the SABAA should be conducted (or the latest and relevant Bat Guidelines applicable at the time of the monitoring).
- Mitigation measures could be adapted as per the recommendations of the operational bat specialist as more information becomes available through operational bat monitoring.

A. MITIGATION FOR TURBINE NUMBERS WTG23, WTG24, WTG37, WTG38 and WTG50			
Months	**Time periods**	**Temperature (°C)**	**Wind speed (m/s)**
February	19:00 – 02:00	Between 14 and 19 °C	Between 2.5 and 9 m/s
March	19:00 – 02:00	Between 14 and 19 °C	Between 2.5 and 9 m/s
April	19:00 – 02:00	Between 14 and 19 °C	Between 2.5 and 9 m/s

B. MITIGATION FOR TURBINE NUMBERS WTG23, WTG24, WTG37, WTG38 and WTG50, or as advised by the bat specialist			
Months	**Time periods**	**Temperature (°C)**	**Wind speed (m/s)**
September	19:00 – 02:00	Between 14 and 22 °C	Between 2.5 and 9 m/s
December	19:00 – 02:00	Between 14 and 22 °C	Between 2.5 and 9 m/s
January	19:00 – 02:00	Between 14 and 22 °C	Between 2.5 and 9 m/s

- **Visual Impacts:**
  - Design Phase:
    - Ensure that the design of the WEF takes the sensitivity mapping of the visual specialist into account (see Figure D.9 in Section D in the BA report).
    - Ensure that no turbines are placed within 500 m of the existing dwellings and potentially sensitive receptor locations.
    - Where possible, fewer but larger turbines with a greater output should be utilised rather than a larger number of smaller turbines with a lower capacity.
    - Turbine colours should adhere to SACAA requirements.
    - Where possible, the O&M buildings must be consolidated to reduce visual clutter.

- The O&M buildings must be painted with natural tones that fit with the surrounding environment. Non-reflective surfaces must be utilised where possible.

- Construction Phase:

  - Position laydown areas and related storage/stockpile areas in unobtrusive positions in the landscape, where possible.
  - Minimise vegetation clearing and rehabilitate cleared areas as soon as possible.
  - Vegetation clearing should take place in a phased manner.
  - Make use of existing gravel access roads where possible.
  - Limit the number of vehicles and trucks travelling to and from the proposed site, where possible.
  - Ensure that dust suppression techniques are implemented:
    - on all access roads;
    - in all areas where vegetation clearing has taken place;
    - on all soil stockpiles.
  - Maintain a neat construction site by removing litter, rubble and waste materials regularly.

- Operational Phase:

  - Inoperative turbines must be repaired promptly.
  - If turbines need to be replaced for any reason, they must be replaced with the same model, or one of equal height and scale.
  - Light fittings for security at night must reflect the light toward the ground and prevent light spill.
  - Where possible, operation and maintenance buildings must not be illuminated at night.
  - Cables must be buried underground where feasible.
  - The O&M buildings must be painted with natural tones that fit with the surrounding environment and non-reflective surfaces must be utilized where possible.
  - Dust suppression techniques must be implemented on all access roads.

- Decommissioning Phase:

  - Carefully plan to reduce the decommissioning period.
  - Minimise vegetation clearing and rehabilitate cleared areas as soon as possible.
  - Maintain a neat decommissioning site by removing rubble and waste materials regularly.
  - Make use of existing gravel access roads where possible.
  - Dust suppression techniques must be implemented on all gravel access roads.

- **Heritage Impacts (Archaeology and Cultural Landscape):**

  - A chance fossil finds procedure needs to be incorporated into the EMPrs.
  - A pre-construction survey should be commissioned to check for any remaining archaeological sites that might have been missed during the original survey. Mitigation would then be suggested if required.
  - Landscape scarring must be kept to an absolute minimum.

- If any archaeological material or human burials are uncovered during the course of development, then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

- **Palaeontological Impacts**

  - The ECO and construction workers should be made aware of the possibility of important fossil remains (bones, teeth, petrified wood, plant-rich horizons, fossil termitaria etc.) being found or unearthed during the construction phase of the development.
  - Monitoring for fossil material of all major surface clearance and deeper (>1m) excavations by the ECO on an on-going basis during the construction phase is recommended.
  - Inform the ECO and construction workers of the Fossil Finds Procedure to be followed in the event of fossil occurrences Appendix 4 of the Palaeontological Impact Assessment.
  - Significant fossil finds should be safeguarded and reported at the earliest opportunity to the relevant heritage authority, i.e. SAHRA for recording and sampling by a professional palaeontologist.
  - The palaeontologist must obtain a Fossil Collection Permit from SAHRA for the fossil finds collection should resources be discovered.

- **Agriculture Impacts**

The conclusion of the Agricultural Compliance Statement is that the proposed project is acceptable and the recommendation for its approval is not subject to any conditions, other than the recommended mitigation measures.

(Note: The recommended mitigation measures regarding stormwater run-off control, maintenance of vegetation cover and to strip, stockpile and re-spread topsoil have been incorporated into the EMPrs of this BA Report (Appendix G)).

- **Socio-Economic Impacts**

  - <u>Construction Phase:</u>

    Employment

    - Where reasonable and practical the proponent should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories;
    - Where feasible, efforts should be made to employ local contactors that are compliant with B-BBEE criteria;
    - Before the construction phase commences the proponent should meet with representatives from the NKLM and NDM to establish the existence of a skills database for the area. If such a database exists, it should be made available to the contractors appointed for the construction phase;
    - The local authorities, relevant community representatives and local farmers should be informed of the final decision regarding the project and the potential job

opportunities for locals and the employment procedures that the proponent intends following for the construction phase of the project;
- Where feasible a training and skills development programmes for local workers should be initiated prior to the initiation of the construction phase; and
- The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.

Business

- The proponent should liaise with the NKLM and NDM with regard to the establishment of a database of local companies, specifically B-BBEE companies, which qualify as potential service providers (e.g. construction companies, catering companies, waste collection companies, security companies etc.) prior to the commencement of the tender process for construction contractors. These companies should be notified of the tender process and invited to bid for project-related work;
- Where possible, the proponent should assist local B-BBEE companies to complete and submit the required tender forms and associated information; and
- The NKLM and NDM, in conjunction with the local business sector and representatives from the local hospitality industry, should identify strategies aimed at maximising the potential benefits associated with the project.
- The proponent should consider the need for establishing a MF in order to monitor the construction phase and the implementation of the recommended mitigation measures. The MF should be established before the construction phase commences, and should include key stakeholders, including representatives from the NKLM, farmers and the contractor(s). The MF should also be briefed on the potential risks to the local community and farm workers associated with construction workers;
- The proponent and the contractor(s) should, in consultation with representatives from the MF, develop a code of conduct for the construction phase. The code should identify which types of behaviour and activities are not acceptable. Construction workers in breach of the code should be dismissed. All dismissals must comply with the South African labour legislation; and
- The proponent and contractor (s) should implement an HIV/AIDS awareness programme for all construction workers at the outset of the construction phase.

- <u>Operational Phase:</u>

- The Project Applicant should implement a skills development and training programme aimed at maximising the number of employment opportunities for local community members.
- Maximise opportunities for local content, procurement and community shareholding.
- The enhancement measures listed above, i.e. to enhance local employment and business opportunities during the construction phase, also apply to the operational phase.
- The proponent should implement a training and skills development programme for locals during the first 5 years of the operational phase. The aim of the programme

should be to maximise the number of South African's and locals employed during the operational phase of the project.
- The proponent, in consultation with the NKLM and NDM, should investigate the options for the establishment of a Community Development Trust (see below).
- The NKLM and NDM should be consulted as to the structure and identification of potential trustees to sit on the Trust. The key departments in the NKLM and NDM that should be consulted include the Municipal Managers Office, IDP Manager and LED Manager.
- Clear criteria for identifying and funding community projects and initiatives in the area should be identified. The criteria should be aimed at maximising the benefits for the community as a whole and not individuals within the community.
- Strict financial management controls, including annual audits, should be instituted to manage the funds generated for the Community Trust from the WEF.

- Decommissioning Phase:

  - The proponent should ensure that retrenchment packages are provided for all staff retrenched when the WEF is decommissioned.
  - All structures and infrastructure associated with the proposed facility should be dismantled and transported off-site on decommissioning.
  - The proponent should investigate the option of establishing an Environmental Rehabilitation Trust Fund to cover the costs of decommissioning and rehabilitation of disturbed areas. The Trust Fund should be funded by a percentage of the revenue generated from the sale of energy to the national grid over the 20-year operational life of the facility. The rationale for the establishment of a Rehabilitation Trust Fund is linked to the experiences with the mining sector in South Africa and failure of many mining companies to allocate sufficient funds during the operational phase to cover the costs of rehabilitation and closure. Alternatively, the funds from the sale of the WEF as scrap metal should be allocated to the rehabilitation of the site.

- **Noise Impacts**

  - The Project Developer however should investigate any reasonable and valid noise complaint if registered by a receptor staying within 2,000 m from the location where construction or are taking place or from the operational wind turbines. A complaints register must be kept on site.
  - The potential noise impact must be evaluated again should the layout be revised where any wind turbines are located closer than 1,000 m from a confirmed NSD.
  - The potential noise impact must be evaluated again should the Project Developer make use of a wind turbine with a maximum sound power emission level exceeding 108.5 dBA re 1 pW.

- **Transport Impacts**

  - The delivery of wind turbine components to the site or the removal of components from the site can be staggered and trips can be scheduled to occur outside of peak traffic periods.
  - Dust suppression of gravel roads to be implemented during the construction and decommissioning phases, as required.

- Regular maintenance of gravel roads by the Contractor during the construction and decommissioning phases.
- The use of mobile batch plants and quarries near the site would decrease the impact on the surrounding road network.
- Staff and general trips should occur outside of peak traffic periods as far as possible.
- Any low hanging overhead lines (lower than 5.1 m) e.g. Eskom and Telkom lines, along the proposed routes will have to be moved to accommodate the abnormal load vehicles.
- The preferred route should be surveyed to identify problem areas e.g. intersections with limited turning radii and sections of the road with sharp horizontal curves or steep gradients, that may require modification. After the road modifications have been implemented, it is recommended to undertake a "dry-run" with the largest abnormal load vehicle, prior to the transportation of any turbine components, to ensure that the delivery of the turbines will occur without disruptions. This process is to be undertaken by the haulage company transporting the components and the contractor, who will modify the road and intersections to accommodate abnormal vehicles. It needs to be ensured that the gravel sections of the haulage routes remain in good condition and will need to be maintained during the additional loading of the construction phase and reinstated after construction is completed.
- Design and maintenance of internal roads. The internal gravel roads will require grading with a road grader to obtain a flat even surface and the geometric design of these gravel roads needs to be confirmed at detailed design stage. This process is to be undertaken by a civil engineering consultant or a geometric design professional. The road designer should take cognizance that roads need to be designed with smooth, relatively flat gradients to allow an abnormal load vehicle to ascend to the top of a hill.

- **Geotechnical Impacts**

  - The foundation design to avoid blasting and deep excavation into sound rock.
  - Maintain vegetation cover as far as possible.
  - Strip, stockpile and re-spread topsoil.

- **Wake loss effect**

  - Given the preliminary nature of the current configurations and the limited information available at this time, DNV GL recommends more detailed wake loss effect investigations are carried out when more information is available.

Minnelise Levendal

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NAME OF EAP

April 2021

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SIGNATURE OF EAP DATE