DRAFT BASIC ASSESSMENT REPORT

THE BASIC ASSESSMENT FOR THE PROPOSED KOMAS WIND ENERGY FACILITY AND ASSOCIATED INFRASTRUCTURE NEAR KLEINSEE IN THE NORTHERN CAPE PROVINCE.

SUMMARY

APRIL 2021

Prepared by:
CSIR Environmental Management Services
PO Box 320, Stellenbosch
7599
South Africa

genesis eco-energy DEVELOPMENTS

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EXECUTIVE SUMMARY

INTRODUCTION

The Project Applicant, Genesis ENERTRAG Komas (Pty) Ltd (hereafter referred to as the "Project Applicant"), is proposing to design, construct and operate the Komas Wind Energy Facility (WEF) and associated infrastructure near Kleinsee in the Northern Cape Province. The proposed project is located approximately 35 km southeast of Kleinsee and 53 km southwest of Springbok. The locality of the proposed project is depicted in Figure S.1. The proposed project is located within the Nama Khoi Local Municipality, which falls within the Namakwa District Municipality. The proposed Komas WEF will have a capacity of up to 300 MW and will comprise of up to 50 Wind Turbine Generators (WTGs).

The associated infrastructure includes a solid state lithium-ion Battery Energy Storage System (BESS) and various structures, buildings and electrical grid infrastructure (EGI) such as, but not limited to an on-site 33/132 kV Substation (SS). Two site alternatives for the BESS and on-site SS (known as the BESS and SS complex) (i.e. Option 1 and Option 2) have been identified for assessment as part of the BA process (Figure A.1). A construction laydown area was also identified and includes the Operation and Maintenance (O&M) buildings.

The proposed Komas WEF project will be developed on the following farm portions as indicated in Table S.1. The approximate coordinates of the boundary points of the proposed Komas WEF project as well as the centre points for the preferred BESS and SS complex are included in Appendix A.3 of this BA report.

Table S.1. Affected Farm Portion Details

Farm Name	21 Digit Code	Parcel Number
Portion 1 of the Farm Zonnekwa No.326	C05300000000032600001	326
Portion 2 of the Farm Zonnekwa No.328	C05300000000032800002	328
Portion 3 of the Farm Zonnekwa No.328	C05300000000032800003	328
Portion 4 of the Farm Zonnekwa No.328	C05300000000032800004	328
Portion 4 of the Farm Kap Vley No.315	C05300000000031500004	315

The Project Applicant is also proposing to develop a 132 kV power line, a 33/132 kV Eskom Switching SS and a Collector SS (if required) to feed the electricity generated by the proposed Komas WEF into the national grid at the Gromis Main Transmission Substation (MTS) (Figure S.1). These electrical infrastructure components will be assessed as part of a **separate application and BA process to be undertaken by the Project Applicant.**

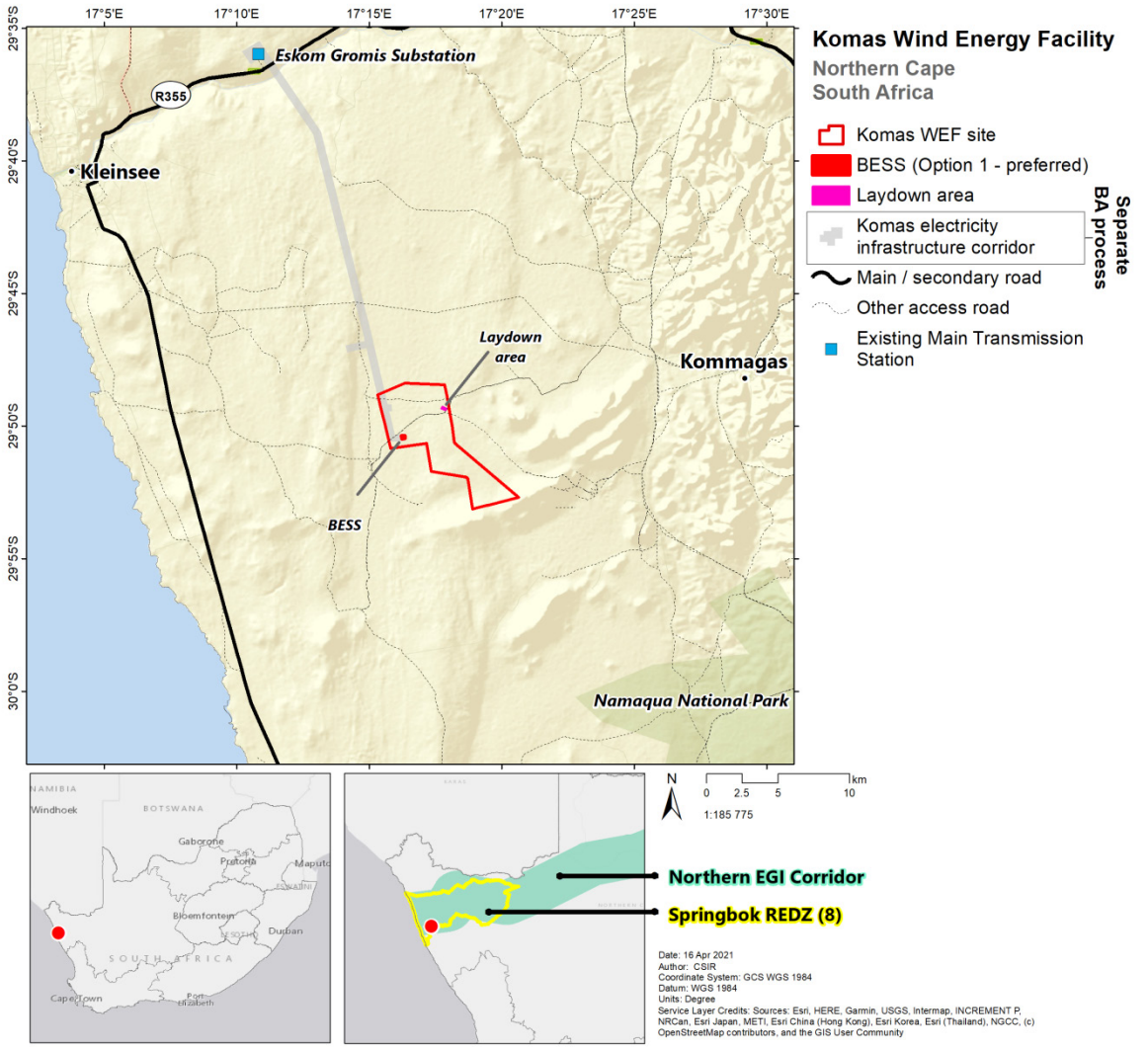

Figure S.1. Locality of the proposed Komas WEF and associated infrastructure

The proposed project is located entirely within the Springbok Renewable Energy Development Zone (REDZ 8), one of the eleven REDZs formally gazetted in South Africa for the purpose of developing solar and wind energy generation facilities (Government Gazette (GG) 41445, Government Notice (GN) 114; 16 February 2018 (Phase 1 with eight REDZs) and GG 44191, GN 144; 26 February 2021 (Phase 2 with three REDZs)). Refer to Figure A.2 for the locality of the proposed project in relation to the REDZs. In line with the gazetted process for a project located within a REDZ, the proposed project will be subject to a Basic Assessment (BA) process instead of a full Scoping and Environmental Impact Assessment (EIA) process and a reduced decision-making period of 57 days, in terms of the National Environmental Management Act, 1998 (Act 107 of 1998), as amended (NEMA) and the NEMA EIA Regulations, 2014, as amended, promulgated in GG 40772; in GN R326, R327, R325 and R324 on 7 April 2017. A BA process in terms of Appendix 1 of the NEMA EIA Regulations, 2014, as amended, has therefore been undertaken for the proposed project. The Competent Authority for the proposed project is the national Department of Environment, Forestry and Fisheries (DEFF), previously operating as the national Department of Environmental Affairs (DEA).

The proposed Komas WEF is located within the Springbok REDZ (i.e. REDZ 8) and is therefore aligned with national initiatives for the placement of WEFs in South Africa. The proposed project also falls within the Northern EGI Corridor, one of the five EGI Corridors gazetted in February 2018. While Listed Activity 9 of Listing Notice 2 of the NEMA EIA Regulations, 2014, as amended, is not triggered by the proposed project, the fact that the proposed project falls within the Northern EGI Corridor is still important as it indicates that the proposed project aligns with the strategic objectives of the country in terms of infrastructure placement.

This Draft BA Report is currently being released to all Interested and Affected Parties (I&APs), Organs of State and stakeholders for a 30-day review period. All comments submitted during the 30-day review will be incorporated and addressed, as applicable and where relevant, into the Final BA Report. The Final BA Report will then 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 REDZ 8, as explained above).

PROJECT BASIC ASSESSMENT TEAM

In accordance with Regulation 12 (1) of the NEMA EIA Regulations, 2014, as amended, the Applicant has appointed the Council for Scientific and Industrial Research (CSIR) to undertake the required BA process in order to determine the biophysical, social and economic impacts associated with undertaking the proposed development. The project team, including the relevant specialists, is indicated in Table S.2 below.

Table S.2: Project Team for the Komas WEF BA process

Name	Organisation	Role/ Specialist Study
CSIR Project Team		
Minnelise Levendal (*Pr.Sci.Nat*.)	CSIR	Environmental Assessment Practitioner (EAP) and Project Leader
Rohaida Abed (*Pr.Sci.Nat*.)	CSIR	Project Team member
Dhiveshni Moodley (*Cand.Sci.Nat.*)	CSIR	Project Officer
Luanita Snyman-van der Walt (*Pr.Sci.Nat*.)	CSIR	Project Mapping
Abulele Adams *(Pr.Sci.Nat.)*	CSIR	Project Mapping
Specialists		
Simon Todd	3Foxes Biodiversity Solutions	Terrestrial Biodiversity Impact Assessment
Louise Zdanow and Joshua Gericke	Enviroswift (Pty) Ltd	Aquatic BiodiversityCompliance Statement
Dr. Rob Simmons	Birds and Bats Unlimited	Avifauna Impact Assessment (including 12 months pre-construction monitoring)
Stephanie Dippenaar	Stephanie Dippenaar Consulting	Bat Impact Assessment (including 12 months pre-construction

Name	Organisation	Role/ Specialist Study
		monitoring)
Kerry Schwartz	SiVEST SA (Pty) Ltd	Visual (including Flicker) Impact Assessment
Dr. Jayson Orton	ASHA Consulting (Pty) Ltd	Heritage Impact Assessment (Archaeology, Cultural Landscape)
John Pether	Private	Palaeontology Impact Assessment
Johann Lanz	Private	Agriculture Compliance Statement
Tony Barbour and Schalk van der Merwe	Tony Barbour Environmental Consulting	Socio-Economic Impact Assessment
Morné de Jager	ENVIRO-ACOUSTIC RESEARCH cc (EAR)	Noise Assessment
Adrian Johnson	JG AFRIKA (Pty) Ltd	Transport Impact Assessment
Dr. Robert Leyland	WSP Environmental (Pty) Ltd	Geotechnical Impact Assessment
Minnelise Levendal (*Pr.Sci.Nat*.), Abulele Adams (*Pr.Sci.Nat*.) and Rohaida Abed (*Pr.Sci.Nat*.)	CSIR	Civil Aviation Site Sensitivity Verification
Minnelise Levendal (*Pr.Sci.Nat*.), Abulele Adams (*Pr.Sci.Nat*.), and Rohaida Abed (*Pr.Sci.Nat*.)	CSIR	Defence Site Sensitivity Verification
Technical Input		
Simon Todd	3Foxes Biodiversity Solutions	Initial Biodiversity Offset Analysis
Mark Botha	Conservation Strategy Tactics and Insight	Additional Biodiversity Offset Report (including proposed implementation)
Kennett Sinclair	DNV GL South Africa (Pty) Ltd	Wake Effects Assessment
Dr. Robert Leyland	WSP	Geology Assessment

It is important to note at the outset that the above technical inputs are purely technical and serve to inform the layout, mitigation and management requirements of the proposed WEF (as required), and do not constitute specialist studies in terms of Appendix 6 of the NEMA EIA Regulations, 2014, as amended.

PROJECT DESCRIPTION

It is important to point out at the outset that the exact specifications of the proposed project components will be determined during the detailed engineering phase (subsequent to the issuing of EA should it be granted for the proposed project).

The footprint of the proposed Komas WEF with a capacity of up to 300 MW will cover an approximate area of 90 hectares (ha). This excludes access roads leading to the site. Several specialists assessed larger areas on the affected farm portions in order to avoid environmental constraints and sensitivities (highlighted by the specialists), during the siting and final design of the facilities and associated infrastructure.

The proposed Komas WEF will comprise of up to 50 WTGs. Each WTG will have a hardstand area of approximately 1 500 m^2, a turbine hub height of up to 200 m and a turbine rotor diameter of up to 200 m. Associated infrastructure includes a construction laydown area (which includes the O&M buildings), a solid state lithium-ion BESS comprising of batteries within shipping containers or a suitable housing structure on a concrete foundation and, an on-site SS. The BESS and on-site SS will be located within a complex of 4 ha in size to allow for micro-siting of the BESS components and to accommodate internal roads (as required), a temporary construction laydown area and a firebreak around the BESS footprint.

Once a Power Purchase Agreement (PPA) is awarded, the proposed Komas WEF will generate electricity for a minimum period of 20 years. The construction phase for the proposed project is expected to extend approximately 24 months.

The proposed Komas WEF and associated infrastructure include the main components and associated specifications as tabulated in Table S.3.

Table S.3: The key project and component details and associated specifications

Component	Description / Dimensions
Site coordinates (centre point)	Lat -29.843279°; Long 17.296014°
Affected farm portion/s	• Portion 1 of the Farm Zonnekwa No. 326 • Portion 2 of the Farm Zonnekwa No. 328 • Portion 3 of the Farm Zonnekwa No. 328 • Portion 4 of the Farm Zonnekwa No. 328 • Portion 4 of the Farm Kap Vley No. 315
SG code/s	• C05300000000032600001 • C05300000000032800002 • C05300000000032800003 • C05300000000032800004 • C05300000000031500004
Total project footprint	Approximately 90 ha
Proposed technology	WTGs and associated infrastructure, including a solid state lithium-ion BESS
Komas WEF site area	Approximately 2 725 ha
Total WEF capacity	Up to 300 MW
BESS capacity	Up to 300 MW/1 200 MWh
Number of turbines	Up to 50 turbines
Turbine hub height from ground	Up to 200 m
Turbine rotor diameter	Up to 200 m
Turbine blade length	Up to 100 m
On-site SS and BESS complex area	Approximately 4 ha (200 m x 200 m)
Height of BESS array	Approximately 5 – 10 m
Height of on-site SS	Approximately 7 – 10 m Up to 22 m (including lighting).
Construction laydown area	A temporary construction laydown/staging area of approximately 4.5 ha (which will also accommodate the O&M buildings)
Permanent laydown area	To be determined based on final layout
O&M building area	Part of the construction laydown area
Turbine hardstand area	Approximately 1 500 m^2 per turbine

Component	Description / Dimensions
Width of internal access roads	Up to 10 m, including turning circle/bypass areas of up to 20 m at some sections during the construction phase. As such, the roads and cables will be positioned within a 20m wide corridor. Existing roads will be upgraded wherever possible, although new roads will be constructed where necessary.
Length of internal access roads	To be determined based on final layout
Site access	Unnamed public gravel road off the R355
Grid connection and proximity (This will be subject to a separate Environmental Assessment process)	Gromis MTS Approximately 30 km
Height of SS, BESS and O&M area fencing	Approximately 2 m to 3 m high
Type of fencing	Galvanised steel
Fencing around the WEF Perimeter	Type: Galvanized steel Height: 1 m to 3 m

As noted above, the proposed EGI, including an Eskom Switching SS, 132 kV power line and Collector SS (if required), will be assessed as part of a separate BA process to be undertaken by the Applicant.

NEED FOR THE BA

As noted above, in terms of the NEMA EIA Regulations, 2014, as amended, published in GN R326, R327, R325 and R324, as well as GN 114 for procedures within a REDZ, a BA process is required for the proposed project. The need for the BA is triggered by, amongst others, the inclusion of Activity 1 listed in GN R325 (Listing Notice 2):

- *"The development of facility or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facility or infrastructure is for photovoltaic installations and occurs (a) within an urban area; or (b) on existing infrastructure".*

Section A of this Draft BA Report contains the detailed list of activities contained in GN R327, R325 and R324 which are triggered by the various project components and thus form part of this BA process.

The purpose of the BA is to identify, assess and report on any potential impacts the proposed project, if implemented, may have on the receiving environment. The BA therefore needs to show the Competent Authority, the DEFF; and the Project Applicant, what the consequences of their choices will be in terms of impacts on the biophysical and socio-economic environment and how such impacts can be, as far as possible, enhanced or mitigated and managed as the case may be.

IMPACT ASSESSMENT

Table S.2 provides a list of specialist studies that were undertaken as part of the BA process. The full specialist studies are provided in Appendix C.1 – C.11 of this Draft BA Report. In addition, two site sensitivity verification assessments were undertaken for Civil Aviation and Defence (Appendix C.12

and Appendix C.13 respectively). Section B of this report provides a summary of the affected environment associated with these studies. Section D provides a summary of the impact assessments conducted by the specialists.

In addition to the specialist studies and site sensitivity verification assessments, technical inputs/studies on Geology (Appendix J.1) and Wake Effect (Appendix J.2) were also conducted.

A separate Terrestrial Biodiversity Offset Analysis was also commissioned by the Project Applicant and was undertaken by the Terrestrial Biodiversity Specialist on the project, Mr. Simon Fox of *3Foxes Biodiversity Solutions* (Appendix J.3 (2) of this BA Report). This study was undertaken to ascertain the need to determine and implement a Biodiversity offset to mitigate the potential negative impacts on terrestrial biodiversity. This is due to the fact that the project site is partly located within a Critical Biodiversity Area (CBA) Tier 2, the Northern Cape Protected Area Expansion Strategy (NC-PAES) Focus Area, the National Protected Area Expansion *Strategy* (PAES) Focus Area, the Namaqua National Park (NNP) expansion area, and the NNP buffer zone. The proposed development of the Komas WEF raises a concern regarding the possible impact of the development on CBAs, the NC and National PAES Focus Area, the NNP expansion footprint area, and the NNP buffer zone. It also raises concerns about achieving the long-term conservation targets of the affected area (see the pre-application comments from SANParks dated 15 February 2021 included in Appendix D of the BA Report).

The outcome of the Terrestrial Biodiversity Offset Analysis (Todd, 2021(b)) is that the proposed Komas WEF site is not unique and does not have any features present that would be impacted by the proposed development that are of a high conservation value. Although the southern section of the Komas site falls within a CBA 2 and NC -PAES Focus Area, the analysis suggests that impacts on these features would be acceptable and that there are no high or moderate impacts following mitigation on terrestrial biodiversity associated with the proposed Komas WEF development that would warrant an offset. The study therefore concluded that a Biodiversity Offset is not considered necessary for development of the site and recommended that on-site mitigation and avoidance measures (i.e. a 50% reduction of the grazing capacity on the proposed Komas WEF site) are considered sufficient to reduce the impacts of the development on the CBA and NC-PAES Focus Area to an acceptable level.

However, these on-site mitigation and avoidance measures were not deemed acceptable to DEFF and SANParks following the pre-application meetings we had with them. 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 Study (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). **It should be noted that the recommendations of the additional Biodiversity Offset Report (including proposed implementation) (Botha, 2021) replace those in the initial Biodiversity Offset Analysis (Todd, 2021(b)) which was undertaken prior to the comments raised by DEFF and SANParks during the pre-application phase.**

The Biodiversity Offset Report (including proposed implementation) (Botha, 2021) recommends that an offset of 810 ha, of Namaqualand Strandveld or an alternative mix of related vegetation types of greater conservation value, in the Expansion Footprint of the NNP and be within at least a CBA 2. The optimal location for this from a biodiversity perspective is likely the southern part of Portion 1 of the Farm Platvley 314, which is also owned by one of the owners of the proposed Komas WEF site. This

site has also been assessed for the development of a WEF (known as the Gromis WEF). 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 Protected Area. More details on the proposed Biodiversity Offset and the calculation thereof is included in Section B of this BA Report. It is important to note that the findings and recommendations of the Biodiversity Offset Implementation study (i.e. the implementation of a biodiversity offset) are acceptable and supported by the EAP and the Project Applicant.

The Biodiversity Offset Implementation study concluded that although the proposed Komas WEF impacts marginally on the NNP Expansion Footprint, and thus the PAES focus area, as well as 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 within a REDZ and there are several offset options in the immediate vicinity, all with high likelihood of success, the specialist (Botha, 2021) notes that he has no objections to the development proceeding.

A summary of the specialist assessments included in Appendices C.1 – C.11 is outlined below.

Terrestrial Biodiversity Impact Assessment

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. The Terrestrial Biodiversity Impact Assessment 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 report. A summary of the Terrestrial Biodiversity Impact Assessment is provided below.

***Important Note:** The Terrestrial Biodiversity Impact Assessment (Appendix C.1) was undertaken and commissioned in September 2018. It was therefore commissioned a substantial period prior to the Assessment Protocol published in GN 320 on 20 March 2020 came into effect. This study was also undertaken and commissioned prior to the Species Protocol published in GN 1150 dated 30 October 2020 (as discussed in Section A.10) came into effect. Therefore, the Terrestrial Biodiversity Impact 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 biodiversity specialist, Simon Todd of 3Foxes Biodiversity Solutions, is provided in Appendix F.2.*

Summary of affected environment

The vegetation of the Komas site consists of relatively homogenous Namaqualand Strandveld. The low-lying area in the 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. There are also some areas of mobile dunes and rocky outcrops which should also be avoided as far as possible. The abundance of Species of Conservation Concern (SCC) across the site is however relatively low and a significant impact on features or SCC is unlikely. In terms of fauna, there are relatively few SCC that are likely to be present at the site. This is in part at least due to the low range of habitats present at the site, most notably the general lack of rocky outcrops. The major impact on fauna would be direct habitat loss of approximately 90 ha as well as

some low-level operation phase disturbance resulting from maintenance activities and turbine noise. There are no local populations of fauna within the site that are likely to be compromised by the development as the total footprint is relatively low in proportion to the overall extent of the site and there are still extensive areas within and adjacent to the site that would not be affected.

The southern half of the site falls within a Critical Biodiversity Area (CBA 2) as well as a Northern Cape Protected Area Expansion Strategy (NC-PAES) Focus Area and the Namaqua National Park's Expansion Footprint, which raises some concern regarding the potential impact of the development on ecological processes and options for future conservation expansion in the area.

The field assessment suggests that the site is not likely to be of high significance for broad-scale ecological processes and as the site is already almost surrounded by other approved WEFs, it is not likely to be viewed as a current priority for formal conservation expansion. In addition, it has few features or SCC, its irreplaceability value is likely to be low. Given that the overall footprint of the wind farm represents less than 2-5% of the landscape, the development is considered to be broadly compatible with the aims of Ecological Support Areas (ESAs) provided that impacts such as erosion can be properly mitigated. The development footprint within the CBA 2 is 31 ha which represents less than 2% of the area of CBA within the Komas study area only and significantly less of the whole affected CBA. The parts of the site that fall within the NC-PAES Focus Area do not contain any species or habitats that are not widely available in adjacent areas. A separate offset study indicates that an offset is not considered necessary for development of the site and the on-site mitigation and avoidance measures that have been recommended are considered sufficient to reduce the impacts of the development on the CBA and NC-PAES Focus Area to an acceptable level.

Cumulative impacts

There are several other approved developments proposed in the area around the proposed Komas WEF site. This includes the 300 MW Kap Vley project east of the site, the 140 MW Namas WEF west of the site and the 140 MW Zonnequa WEF northwest of the site and the 300MW Eskom Kleinzee WEF towards the coast and the Project Blue WEF around Kleinsee. Those projects further afield are generally in a different environment and ecological context from the Komas 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 700 ha 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 4 000 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).

Summary of Impact Assessment

The potential impacts identified in the Terrestrial Biodiversity Impact Assessment, including direct and cumulative impacts during the construction, operational and decommissioning phases are listed below.

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 lay-down and other temporary infrastructure is within medium- or low-sensitivity areas, 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 Environmental Control Officer (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 site such as construction camps must be lit at night, this should be done with low Ultra Violet (UV) type lights (such as most LEDs) as far as practically possible, which do not attract insects and which should be directed downwards.	**Moderate**	**Low**
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**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
OPERATIONAL PHASE: DIRECT IMPACTS			
Increased soil erosion.	• Erosion management at the site should take place according to the Erosion Management Plan and Rehabilitation Plan. • 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.	**Moderate**	**Low**
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 be avoided as far as possible.	**Moderate**	**Low**
Impacts on fauna.	• An Open space management plan must be	**Moderate**	**Low**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
	developed 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.		
Impacts 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. • 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.	**Moderate**	**Low**
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 3 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	**High**	**Low**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
	appropriate erosion control structures and revegetation techniques.		
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 3 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.	**High**	**Low**
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). In addition, comment on the Terrestrial Biodiversity Impact Assessment and the Biodiversity Offset Analysis including the recommendations held there-in, has been received from SANParks and the Northern Cape Department of Agriculture, Environmental	**Moderate**	**Low**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
	Affairs, Rural Development and Land Reform (DAEARDLR) (previously operating as the Northern Cape Department of Environment and Nature Conservation (DENC) • 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 Area. (Note: An initial Biodiversity Offset Analysis has been completed and is included in Appendix J.3(2) of this BA Report).		

In response to SANParks comments received during the pre-application phase, below is the impact assessment provided by Mr. Mark Botha in his Additional Biodiversity Offset 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[1] for a biodiversity offset. This includes highly summarised impact ratings for Birds and Bats.

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.

[1] The draft Offset Guideline (DEA 2017) suggests offsets are appropriate for residual negative moderate to high impacts

Comparative assessment of alternatives

Two alternatives were provided by the Project Applicant for assessment for 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). However, Option 1 is also feasible and is acceptable from a Terrestrial Biodiversity impact perspective.

Concluding statement from the initial Biodiversity Offset Analysis(Todd, 2021(a))

The proposed Komas WEF site is considered to represent a broadly suitable environment for wind farm development. There are no specific long-term impacts likely to be associated with the wind farm that cannot be reduced to an acceptable level through mitigation and avoidance. Although the development will impact on areas classified as ESAs, CBAs and the NC-PAES Focus Area, the conservation value of the site is not considered exceptional and the location and context of the site, suggest that these impacts are likely to be acceptable and would not significantly restrict future conservation expansion in the greater Namaqualand area. As there are no high residual impacts or fatal flaws associated with the development, it can be supported from a Terrestrial Biodiversity perspective. **It is therefore the reasoned opinion of the specialist that the proposed Komas WEF and associated infrastructure should be authorised, subject to the implementation of the recommended mitigation measures.**

Concluding statement from the additional Biodiversity Offset Report (including proposed implementation) (Botha, 2021)

Although the proposed Komas WEF impacts marginally on the NNP Expansion Footprint, and thus the PAES focus 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, I have no objections to the development proceeding. An offset of 810 ha, in Namaqualand Strandveld or an adjacent, related vegetation type in the PAES focus area is prudent, and the optimal location for this from a biodiversity perspective is likely a portion of the Gromis property.

Aquatic Biodiversity Compliance Statement

The Aquatic BiodiversityAssessment 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 accordance with the requirements of the Aquatic Biodiversity Protocol as per Government Notice 320 published in GG No. 43110 on 20 March 2020. The web-based national Screening Tool indicates that a full Aquatic Biodiversity Specialist Assessment is required. However, the aquatic specialist identified no watercourses on site. Therefore, 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 as indicated above. 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. The complete Aquatic Biodiversity Compliance Statement is included in Appendix C.2 of this report. A summary of the Compliance Statement is provided below.

Comparative assessment of alternatives

Two alternatives were provided by the Project Applicant 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.

Summary of affected environment

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.

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 National Water Act, 1998 (Act 36 of 1998) (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.**

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 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.

Avifauna 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 was 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. A summary of the Avifauna Impact Assessment is provided below.

***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.**

Summary of affected environment

Priority avifauna were monitored and recorded at the proposed 300 MW Komas WEF site over 12 months as required by 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).

Kleinsee lies in the Succulent Karoo Biome of the Northern Cape and this report details the number of priority species (i.e. all threatened and collision-prone birds) and their Passage Rates through the 27-km^2 area proposed for the proposed Komas WEF development from March 2019 (autumn) to December 2019 (summer). We quantify and predict possible threats, and map high-risk and medium-risk areas to reduce future potential impacts to avifauna at the proposed Komas WEF site.

The impact zone of the proposed Komas WEF site lies within the coastal area of the Succulent Karoo biome. Dry and uniform grazed habitats within this undulating area allows a small suite of arid-adapted and nomadic species to exist. Up to date bird atlas data from the Southern African Bird Atlas Project 2 (SABAP2) of the broader region indicates that the area proposed for the development supports a low diversity of 48 bird species.

- The records of the avifauna specialist which focussed on the proposed Komas WEF site in a particularly dry period, found 58 species in 12 months of monitoring.
- More species (43 and 49 species) were present in spring and summer, following rains, and this brought in more priority (6 and 8 species) and more Red Data species (3 and 3 species) respectively.
- Eight priority collision-prone species occurred over the year of which three were red-listed: Verreaux's Eagle *Aquila verreauxii* (ranked 2nd in top 100 collision-prone species); Ludwig's Bustard *Neotis ludwigii* (ranked 10th); and Southern Black Korhaan *Afrotis afra* (ranked 35th).

South African turbines kill 4.1-4.6 birds per turbine annually of which raptors comprise 36% (Perold et al. 2020). As such they may impact the five species of raptor that frequent the site.

- Both the annual passage rate of all collision-prone species on the proposed Komas WEF site (0.39 birds per hour), and the three Red Data species alone (0.15 birds per hour) were medium-high, increasing the probability of impacts especially for any turbines proposed in frequently used areas by raptors.

- Risk is also increased by the proportion of time priority species spent in the blade swept area (from 100 m to 300 m, for 200 m Hub Height turbines with 100 m blades).
- Priority species flew at these heights 78% of the time (Verreaux's Eagle); 40% of the time (Black-chested Snake Eagle); 56% of the time (Booted Eagle) and 0% of the time (Ludwig's Bustards), thereby increasing risk to the raptors.
- Based on frequent flights of Red Data species or where two or more priority species overlapped, **no areas of high-risk were identified.**
- However, **five areas of medium-risk were found on the proposed Komas WEF site**. These were located through-out the proposed Komas WEF site where the Snake Eagles and Booted Eagles were particularly active (Figure B.35).

Important note: The current updated turbine layout avoids the areas identified as medium-risk in the Avifauna Impact Assessment (Appendix C.3).

The specialist recommends that if turbines are positioned within the medium-risk areas and they are found to kill any Red Data birds a single blade should be painted black (or with signal red paint) for those select turbines to reduce impacts for eagles and other raptors (Stokke et al. 2017).

Cumulative impacts

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.

Summary of Impact Assessment

The potential direct impacts to avifauna during the construction, operational and decommissioning phases of the facility are indicated below. Cumulative impacts are also identified.

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 identified as at risk (as noted above).	• 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. • 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.	**Moderate-High**	**Moderate**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
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**

Comparative assessment of alternatives

The 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. However, Option 1 is not fatally flawed and can be implemented.

Concluding statement

The anticipated 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 in the Avifauna Impact Assessment (Appendix C.3) and in the EMPrs (Appendix G of this BA Report) are strictly adhered to.

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, as there is no relevant protocol on the National Web-based Screening Tool. The complete Bat Impact Assessment is included in Appendix C.4 of this report. A summary of the Bat Impact Assessment is provided below.

Summary of affected environment

Four static bat monitoring systems were deployed at the proposed Komas WEF site, two at the Met mast and two at temporary 10 m masts. Data was collected between 10 August 2019 and 23 September 2020, representing the four seasons of the year. Seven of the 12 species that have distribution ranges overlapping with the development site and nearby surrounding area were confirmed through bat recording devices. *Tadarida aegyptiaca* (Egyptian free-tailed bat) is the most dominant species on site, with nearly all the calls at the high monitoring system, situated within the rotor swept area, being part of the *Molossidae* family. These are high risk bats as they are adapted to forage at high altitudes. A limited number of one red data species, namely *Miniopterus natalensis (*Natal long-fingered bat), was recorded.

The farm buildings, rocky outcrops, relative denser vegetation, limited trees and livestock water points could be potential sources for bat roosting and foraging at the study area. According to SANBI's Database (2012) the main vegetation type at the study area is Namaqualand Strandveld. Namaqualand Klipkoppe Shrubland is situated at the south-eastern border of the site. This vegetation type is characterised by rocky outcrops and large boulders which are ideal for bat roosts. However, the updated project layout excludes this area for the placement of turbines or any associated infrastructure.

The most important aspect of the project that would affect bats adversely is the wind turbines themselves, and in particular, direct collisions and barotrauma as a result of operational turning blades. Loss of foraging habitat, loss of existing and potential roosts and attracting bats by artificially creating new bat conducive areas amongst the turbines, further summarise the main potential negative impacts to bats due to wind farm developments.

Low bat activity was recorded during winter and summer transects, but high activity occurred during the transect conducted in spring 2020. It is speculated that the relative increased rainfall in 2020 in the Kleinsee area, could have been the cause of occasional insect emergence, which resulted in sporadic high bat activity. This should be closely monitored during the operational phase.

According to the recorded data, bats at the proposed Komas WEF site are more active during late summer and autumn, between February and May, with a peak in activity around March. High bat activity is also observed in September, 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, with activity starting to decline around four to five hours before sunrise, around 1:00 a.m.

During the monitoring period, the hourly mean bat activity for the proposed Komas WEF site was higher than the highest threshold figures for the Succulent Karoo biome. This indicates that bat populations might be severely negatively impacted upon by the wind energy development should the development progresses without mitigation measures. The monitoring system stationed at high altitude was used to plot bat activity and weather conditions to describe the relationship between weather conditions and bat activity, in particular activity within the rotor swept area of the turbine blades. This information was then used to develop a mitigation scheme for the wind farm.

The following mitigation is suggested 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 D.1 of this BA Report).
   ail

2. **Curtailment at specific turbines**

   A. **Curtailment** is the act of limiting the supply of electricity to the grid during conditions when it would normally be supplied. This is usually accomplished by feathering the turbine blades with the aim to raise the cut-in speed. Curtailment should 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:

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

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, and mortality will have to be below the threshold.

B. Additional Curtailment to be implemented, under the advice and supervision of the operational bat specialist, 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 andso 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 shouldwould be minimal so thatto 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 immediately after installation for the duration of the project to prevent bat mortality.

4. Bat deterrents

Bat deterrents is 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 the South African Bat Assessment Association (SABAA). During post construction, turbines with high mortality could be specifically targeted for bat deterrents.

All turbine components should be excluded from No-Go areas as indicated on the bat sensitivity map (Figure 30 of the Bat Impact Assessment). Mitigation is recommended, as per Section 9 of the Bat Impact Assessment and summarised above, for the turbines situated within the medium to high zones. The rest of the proposed Komas WEF site is classified as of medium sensitivity. Operational monitoring should inform the extent of mitigation required, but due to the bat activity being above threshold, there is a possibility that more stringent mitigation would be required and would need to be implemented by the Project Developer. Therefore, the Project Developer needs to include this in the financial cost structure from the start of the project. If bat mortality is lower than expected, thus below the threshold, it will be up to the discretion of the operational bat specialist as to whether curtailment could be reduced.

The turbine layout of the development option of the proposed wind farm, as provided, is the preferred option to accommodate the bat sensitivity map by avoiding highly sensitive areas. Additional to mitigation by turbine positioning to avoid sensitive areas, other options may be utilised when

necessary such as feathering of blades parallel to the wind to reduce blade rotation to a bare minimum and curtailment of blade movement when turbines are not generating power.

Cumulative impacts

For the cumulative effect, the total output of approximately 1 063.7 MW for wind developments within a 50 km radius of the proposed Komas WEF site, 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 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 the 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 excarbated if one considers that most bats are high risk species. If mitigation is diligently conducted at all wind farms, this impact could be reduced.

Summary of Impact assessment

The following potential direct, indirect and cumulative impacts for the construction, operational and decommissioning phases were identified.

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 lights or spotlights. • Lights should avoid skyward illumination. Turbine tower lights should be switched off when not in operation, where possible.	**Moderate**	**Low**
OPERATIONAL PHASE: DIRECT IMPACT			
Fatality of resident bats through direct collision or barotrauma.	• Maintain a register of action taken regarding bat mortality/injury as well as queries or complaints. • 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.	**High**	**Moderate**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
	• 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 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,		

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
	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 Lighting of WEF should be kept to a minimum and directed downwards. • Post-construction bat monitoring to determine the most effective cut-in speed for turbines on site. Implement curtailment and feathering mitigation measures and select the cut-in speed that demonstrates a significant reduction in bat mortality as the default cut-in speed during periods of peak bat activity on site. • Care should be taken during post construction monitoring to verify the numbers of M. natalensis, especially within the rotor swept area of the turbine blades. • 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.	• Bat fatalities should be monitored by fatality searches and a record kept of date, time, location, gender, cause of death. Carcasses should be photographed to be used for searcher efficiency and carcass removal trails. • 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)). 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.	**Low**	**Low**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
Bat fatality due to the attraction of bats to turbine blades.	• Develop an adaptive mitigation plan based on results from post-construction monitoring to modify the cut-in speed and hours of curtailment of selected turbines. • Investigate ultrasonic deterrents and implement at turbines with high fatality.	**Low**	**Low**
Loss of habitat and foraging space during operation of the wind turbines.	• Buffer sensitive habitat and foraging areas and where possible minimise lighting on turbines that could attract insects and bats. • 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.	• Although not enforceable on the Project Applicant, the project specific mitigation should be adhered to, especially adhering to buffer zones and sensitivity areas and recommended mitigation, for each renewable energy project.	**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 that the buffer zones and sensitivity areas should be adhered to and	**Moderate**	**Low**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
	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**

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 preferred option from a bat perspective and both options are acceptable.

Concluding statement

The turbine layout was updated following bat specialist input to avoid environmentally sensitive areas. If the Project Applicant adheres to the proposed mitigation measures, the potential impact on bats from the proposed Komas WEF 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 undertaken at the proposed Komas WEF site, that Environmental Authorisation (EA) may be granted to the proposed project.**

Visual (including Flicker) Impact Assessment

The Visual (including Flicker) Impact Assessment (VIA) was undertaken by Kerry Schwartz of 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 as there is no relevant protocol on the Screening Tool. The complete VIA is included in Appendix C.5 of the BA Report. A summary of the VIA is provided below.

Summary of affected environment

Although the study area has a largely natural, untransformed visual character with some elements of rural / pastoral infrastructure, it is not typically valued or utilised for its tourism significance. The study area has however seen very limited transformation or disturbance and is considered largely natural. As such the proposed Komas WEF development is expected to alter the visual character of the area and contrast significantly with the typical land use and / or pattern and form of human elements present.

A broad-scale assessment of landscape sensitivity, based on the physical characteristics of the study area, economic activities and land use that predominates, determined that the area would have a low to moderate visual sensitivity. However, an important factor contributing to the visual sensitivity of an area is the presence, or absence of visual receptors that may value the aesthetic quality of the landscape and depend on it to produce revenue and create jobs.

No formal protected areas, leisure-based tourism activities or sensitive receptor locations were identified and there are no recognised tourism or scenic routes in the study area. In addition, there is limited human habitation resulting in relatively few potentially sensitive receptors in the area.

The VIA identified thirteen potentially sensitive receptors in the study area, all of which are farmsteads. These farmsteads are regarded as potentially sensitive visual receptors as they are located within a mostly natural setting and the proposed Komas WEF development will likely alter natural vistas experienced from these dwellings. The VIA determined that the proposed development

will have a high level of impact on three (3) of these receptors. Most of these four receptors are farmsteads located in relatively close proximity to the proposed Komas WEF development area and this factor, in conjunction with the relatively flat terrain in the area and the lack of screening vegetation, gives rise to a high impact rating. None of these receptors are tourism-related facilities however, and as such they are not considered to be Sensitive Receptors. In addition, it should be noted that three of these receptors, namely R12, R14 and R15, are located on the application site for the proposed Kap Vley WEF and as such it is possible that residents at these locations may not perceive the proposed Komas WEF in a negative light.

Seven (7) of the remaining receptor locations would be subjected to moderate levels of visual impact as a result of the proposed development and the remaining three (3) receptors would only experience negligible levels of visual impact.

The significance of the overall impact rating revealed that the proposed Komas WEF is expected to have a **negative low visual impact rating during construction and a negative moderate visual impact rating during operation**, with relatively few mitigation measures available.

Cumulative impacts

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 REDZ 8 known as Springbok, and thus the relevant authorities support the concentration of renewable energy developments in this area. In addition, it is possible that the three 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.

Summary of Impact assessment

The potential visual impacts resulting from the proposed Komas WEF 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.

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 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).	<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 exclusion buffers – see Figures D.9 and D.12 of this BA Report). • 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 South African Civil Aviation Authority (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	**Moderate**	**Moderate**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
	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			
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	• 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.	**Moderate**	**Moderate**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation

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.
	• 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 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	**Moderate**	**Moderate**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
	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.		

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. No fatal flaws were identified for either of the alternatives. Option 2 was found to be favourable. Option 1 was identified as the preferred alternative as Option 2 is closer to the nearest receptor.

Concluding statement

From a visual perspective therefore, the project is deemed acceptable and an EA should be granted. SiVEST is of the opinion that the potential impacts associated with the construction, operation and decommissioning phases can be mitigated to acceptable levels provided the recommended mitigation measures are implemented.

Heritage Impact Assessment (Archaeology and Cultural Landscape)

The Heritage Impact Assessment (HIA) was undertaken by Dr. Jayson Orton of ASHA Consulting to inform the outcome of this BA from an archaeology and cultural landscape perspective. The HIA was undertaken in accordance with Appendix 6 of the NEMA EIA Regulations, 2014, as amended as there is no relevant Protocol on the Screening Tool. An integrated HIA, containing Archaeology, Cultural Landscape and Palaeontology, has been undertaken for the project. However, for ease of reference, this section only deals with the Archaeology and Cultural Landscape. The complete HIA is included in Appendix C.6 of the BA Report. A summary of the HIA is provided below.

Summary of affected environment

The study area is an undulating, sandy coastal plain with a light vegetation covering. Dune ridges occur with deflation hollows generally located along the crests of these ridges. Infrastructure is absent aside from a few gravel roads through the area, occasional power lines and some farmsteads.

Summary of affected environment

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 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. 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.

Cumulative impacts

Cumulative impacts are similar to the ones listed above, except that 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.

Summary of Impact assessment

The potential impacts identified in the HIA include direct and cumulative impacts during the construction, operational and decommissioning phases. No indirect impacts are anticipated. The impacts identified are listed below.

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 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 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**

Comparative assessment of alternatives

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

Concluding statement

There are no fatal flaws associated with the proposed development of the Komas WEF.

It is recommended that the proposed Komas WEF should be authorised, but subject to the following conditions which should be incorporated into the EA:

- A chance fossil finds procedure needs to be incorporated into the EMPr;
- 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; and
- 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 authority, i.e. the South African Heritage Resources Agency (SAHRA), 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.

Heritage Impact Assessment (Palaeontology)

The Palaeontology Impact Assessment (PIA) was undertaken by John Pether, a Geological and Palaeontological Consultant, to inform the outcome of this BA from a palaeontological perspective. The PIA was undertaken in accordance with Appendix 6 of the NEMA EIA Regulations, 2014, as amended as there is no relevant Protocol on the Screening Tool. The full Palaeontology Impact Assessment is included as Appendix 4 to the HIA, which is included in Appendix C.6 of the BA Report. A summary of the HIA is provided below.

Summary of affected environment

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.

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.

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

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.

Summary of Impact Assessment

The impacts identified only apply to the construction phase of the proposed development since further significant impacts on fossil heritage during the planning, operational and decommissioning phases of the facility is not anticipated. Cumulative impacts are also identified, as indicated below.

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 (in Appendix C.6 of this report). These recommendations must be included within the EMPr for the 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 PIA (in Appendix C.6 of this report). These recommendations must be included within the EMPr for the 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 (+)**

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 alternatives (Option 1 or Option 2) and therefore both these alternatives are considered acceptable.

Concluding statement

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.

Potential adjustments to the layout of the turbines and infrastructure do not affect this assessment. Both BESS and on-site SS complex area alternatives (Option 1 and Option 2) are acceptable from a palaeontological perspective and either alternative may be developed.

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.

Agriculture

An Agriculture Compliance Statement was undertaken by Johann Lanz to inform the outcome of this BA from an agricultural and soils perspective. The Compliance Statement was undertaken in accordance with the requirements of the Agricultural Protocol for Onshore Wind Energy Generation Facilities where the Electricity Output is 20 MW or more (GG 43110 / GNR 320, 20 March 2020). A Compliance Statement was undertaken, instead of an Assessment as the site was assessed to be of low agricultural sensitivity.

Summary of affected environment

The key findings of this study are:

- Soils of these land type 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.**
- The project site is classified with a predominant **land capability evaluation value of 5 (low)**, although it varies from 4 to 6 across the site (Land Capability Classification for South Africa, 2017).

- The significance of all potential agricultural impacts associated with the development of the proposed Komas WEF is rated as **low** because the proposed site is on land of extremely limited agricultural potential and the footprint of disturbance of the wind farm is limited to a very small proportion of the surface area.
- There are no agriculturally sensitive areas on the site and no parts of the site need to be avoided by the development of the proposed Komas WEF and associated infrastructure.
- Three potential negative impacts of the proposed development on agricultural resources and productivity were identified as:
    - 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. This impact is relevant only in the construction phase. No further loss of agricultural land use occurs in subsequent phases.
    - Soil degradation - Soil can be degraded by impacts in three different ways: 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. This impact is relevant only during the construction and decommissioning phases.
    - Cumulative, regional loss of agricultural land use.
- One potential positive impact of the development on agricultural resources and productivity was identified as:
    - Increased financial security for farming operations from land rental to energy facility.
- All potential impacts (positive and negative) associated with the proposed development were assessed as having **low or very low significance after mitigation.**
- 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).
- The outcome of the site sensitivity verification and assessment therefore confirm the current use of the land as Agriculture and environmental sensitivity **as low** as identified by the National Web-Based Environmental 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).
- Recommended mitigation measures include implementation of an effective system of storm water run-off control; the maintenance of vegetation cover to mitigate erosion; and topsoil stripping, stockpiling and re-spreading to mitigate loss of topsoil on disturbed areas.

Cumulative impacts

In quantifying the cumulative impact, the area of land taken out of grazing as a result of all thirteen developments plus the 300 MW of this development (total generation capacity of 1,993 MW) will amount to a total of approximately 964 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 DEA Phase 1 Wind and Solar Strategic Environmental Assessment (SEA) (2015). As a proportion of the total area within a 50 km radius (approximately 785,300 ha), this amounts to 0.12% 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.

Due to all of the considerations discussed above, the potential cumulative impact of loss of agricultural land use is assessed as having **low significance before and after mitigation. In terms of cumulative impact, therefore, it is recommended that the development be approved.**

Impact assessment

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; and • 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; and • Strip, stockpile and re-spread topsoil.	**Low**	**Low**
CUMULATIVE IMPACT			
Regional loss of agricultural land use.	• None	**Very low**	**Very low**

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.

Concluding statement

- The conclusion of this assessment is that the proposed development of the Komas WEF and associated infrastructure **will not have an unacceptable negative impact on the agricultural production capability of the site**. This is substantiated by the facts that the amount of agricultural land loss is within the allowable development limits, and that the proposed development poses a low risk in terms of causing soil degradation.
- **The proposed development is therefore acceptable and it is recommended that from an agricultural impact point of view, it can be approved.**

Socio-Economic 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, as there is no relevant Protocol or Theme on the Screening Tool. The complete Socio-Economic Assessment is included in Appendix C.8 of this report. A summary of the assessment is provided below.

Summary of benefits of the proposed Komas WEF project

The findings of the Socio-Economic Impact Assessment indicate that the development of the proposed Komas WEF 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 Impact Assessment also indicate that the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) has resulted in significant socio-economic benefits, both at a national level and a local, community level. These benefits are linked to Foreign Direct Investment (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 the Springbok REDZ (REDZ 8). The area has therefore been identified as suitable for the establishment of Renewable Energy Facilities (REFs).

Summary of benefits of the proposed Komas WEF project

- **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 local residents to will also reduce the need to provide accommodation for construction workers in Kleinsee and or Springbok.

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 worker's 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. However, it will not be possible to avoid this. 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.

More potential negative socio-economic impacts to occur during the construction phase are listed in Section D (D.2.9.3) of this BA report.

Cumulative impacts

Cumulative impact on sense of place

Based on the findings of the Socio-Economic 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 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.

Summary of Impact Assessment

A summary of the potential direct and cumulative impacts for the construction, operational and decommissioning phases are identified below. The full assessment is included in the Socio-Economic Impact Assessment (Appendix D.8 of this 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; 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. 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	• 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	**Moderate**	**Low**

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
HIV).	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. • 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	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	**Low**	**Low**

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
communities. Potential impact on family structures, social networks and community services.	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 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 EMPrs should outline procedures for managing and storing waste on	**Moderate**	**Low**

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
	site, specifically plastic waste that poses a threat to livestock if 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	**Moderate**	**Low**

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
	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. • 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	**Moderate**	**Low**

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
	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 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) specialist studies. 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	**Moderate**	**Low**

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
	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. • 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	**High (+)**	**High (+)**

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
	the number of employment opportunities for local community members. • Maximise opportunities for local content, procurement and community shareholding. • Consider establishing a visitor centre.		
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 five years of the operational phase. The aim of the programme should be to maximise the number of South Africans 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).	**Low (+)**	**Moderate (+)**
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 including 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	**Moderate (+)**	**High (+)**

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
	the WEF.		
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. • It is recommended that the Project Applicant meets with the affected landowners to discuss the possibility of 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. • It is recommended that the Project Applicant meets with the affected landowners to discuss the possibility relocating wind turbines that have the highest potential visual impact.	**Low**	**Low**
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	**Moderate**	**Low**

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
	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 as scrap metal should be allocated to the rehabilitation of the site.		
CUMULATIVE IMPACTS			
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 of a number of renewable energy facilities in the NKLM will place pressure on local services, specifically medical, education and accommodation.	• The Northern Cape Provincial Government, in consultation with the NKLM and NDM and the proponents involved in the development 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.	**Moderate**	**Low**
Impact on local economy. The establishment of a number of wind energy facilities in the NKLM will	• The proposed establishment of suitably sited REFs within the NKLM and NDM should be supported.	**Moderate (+)**	**High (+)**

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
create employment, skills development and training opportunities, creation of downstream business opportunities.			

Comparative assessment of alternatives

The BESS and SS complex area Option 1 and Option 2 alternatives have been assessed and both are found to be acceptable from a socio-economic perspective and may proceed as none are fatally flawed.

Concluding statement

The establishment of the proposed Komas WEF and associated infrastructure is strongly supported by the findings of the Socio-Economic Impact Assessment.

Noise Assessment

The Noise Assessment was undertaken by Morné De Jager of Enviro-Acoustic Research cc (EAR) 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. A summary of the Noise Assessment is provided below.

Summary of affected environment

The study area is very remote area with little infrastructure. The study area, and indeed entire farm portion, lacks any sign of development, although some recent/historical materials did betray a historical presence on the land.

The online screening tool identified a number of areas with a very high noise sensitivity as indicated below (Figure D.1 of the Noise Assessment):

- Noise Sensitive Development (NSD) K1 is located approximately 1,475 m to the west from the closest WTG, with two WTGs positioned within 2,000 m from this NSD. This dwelling is permanently used for residential purposes as confirmed during the Noise Assessments for the proposed Namas and Zonnequa WEFs;
- NSD K2 is located around 1,900 m to the east of one WTG (the only WTG within 2,000 m). The farmhouse is occasionally used by the land owner though the smaller dwelling is permanently occupied by the farm employee; and
- NSD K3 is located approximately 2,075 m to the west from the closest WTG, with no WTG positioned within 2,000 m from this NSD. This dwelling is permanently used for residential purposes as confirmed during the Noise Assessment for the Namas and Zonnequa WEFs.

The author agrees with the site sensitivity as highlighted by the online Screening Tool, i.e. areas of very high noise sensitivity were identified on the proposed Komas WEF site. While there are no WTGs located within this potential very high noise sensitive areas, a Noise Specialist Assessment was completed as there are WTGs within 2,000 m from NSDs (as per the requirements of SANS 10328:2008).

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.

Cumulative impacts

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, it 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.

Summary of Impact assessment

The following potential direct, indirect and cumulative impacts for the construction, operational and decommissioning phases were identified.

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**
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	• The Project Developer should investigate any reasonable and valid noise	**Low**	**Low**

Impact	Mitigation measures	Significance before mitigation	Significance after mitigation
due to air-borne noise from the wind turbines operating simultaneously at night.	complaint if registered by a receptor staying within 2,000 m from the location where operational activities are taking place.		
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**

Comparative assessment of alternatives

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

Concluding statement

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.

Transport Impact Assessment

The Transport Impact Assessment (TIA) was undertaken by Adrian Johnson of JG AFRIKA (Pty) Ltd to inform the outcome of this BA from a transport perspective. The TIA was undertaken in accordance with Appendix 6 of the NEMA EIA Regulations, 2014, as amended. The complete TIA is included in Appendix C.10 of this report. A summary of the TIA is provided below.

Summary of potential impacts

- The traffic generated during the construction phase, although significant, will be temporary and impacts are considered to be negative and of high significance before and of **moderate significance** after mitigation.
- During operational phase of the proposed Komas WEF, it is anticipated that staff and security personnel will visit the facility periodically. It is assumed that approximately less than ten (10) 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.
- The traffic generated during the decommissioning phase will be less than the traffic generated during the construction phase and the impact on the surrounding road network will also be negative and of high significance before and of **moderate significance** after mitigation.

Cumulative impacts

To assess the cumulative impact, it was assumed that all WEFs within 50 km currently proposed and authorised, 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 one approved solar Photovoltaic (PV) facility. A separate BA is currently being 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.

Summary of Impact assessment

The following potential direct and cumulative impacts for the construction and decommissioning phases were identified. The potential traffic impacts during the operational phase are minimal. The full assessment is included in the Transport Impact Assessment (Appendix C.9 of the BA Report).

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
CONSTRUCTION PHASE: DIRECT IMPACTS			
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. • 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: DIRECT IMPACTS			
Traffic congestion and delays. Noise and dust pollution	• Stagger turbine component transportation. • Reduce the construction period. • Stagger the decomissioningof 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.	**High**	**Moderate**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
	• Stagger the construction of the turbines. • Staff and general trips should occur outside of peak traffic periods. • Dust suppression.		

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.	

Concluding statement

Based on the findings of this assessment, the potential increase in traffic and the associated noise and dust pollution impacts 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.

Geotechnical 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 Geotechnical Impact Assessment was undertaken in accordance with Appendix 6 of the NEMA EIA Regulations, 2014, as amended. The complete Geotechnical Impact Assessment is included in Appendix C.11 of this report. A summary of the assessment is provided below.

Summary of affected environment

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 before and after mitigation.

The following potential direct impacts for the construction and decommissioning phases were identified. The potential noise impacts during the operational phase are minimal.

Cumulative impacts

The cumulative impacts were assessed to be of very low significance before and after mitigation.

Summary of Impact Assessment

The following potential direct impacts for the construction and decommissioning phases were identified. The potential geotechnical impacts during the operational phase are minimal.

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			
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	Foundation design to avoid blasting and deep excavation into sound rock in the construction and	**Very Low**	**Very Low**

Impact	Mitigation measure	Significance before mitigation	Significance after mitigation
and flora	decommissioning phases.		
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**

Comparative assessment of alternatives

There is no preferred option between the BESS and SS complex area Option 1 or Option 2 alternatives with respect to the Geotechnical Impact Assessment. Both alternatives are favourable.

Concluding statement

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.**

EAP'S RECOMMENDATION

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. This echoes the findings of the specialists as summarised above.

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 included 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.

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 S.4 below provides a summary of the impact assessment for each phase of the proposed project **post mitigation for direct impacts**. Table S.5 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 S.5, 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 S.4. 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**

Specialist Assessment	Construction Phase	Operational Phase	Decommissioning Phase
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			
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 S.5. 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**

Specialist Assessment	Construction Phase	Operational Phase	Decommissioning Phase
CUMULATIVE NEGATIVE IMPACTS			
			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 (+)** / **High (+)**	**Insignificant and/or not identified and/or N/A**

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 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 Kleinsee and Komaggas regions. 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 (i.e. wind and solar Photovoltaic (PV)) within a 50 km radius of the proposed Komas WEF project site. 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 in line with the national planning vision for wind and solar development in South Africa.

Summary of where requirements of Appendix 1 of the NEMA EIA Regulations, 2014, as amended (GN R326) are provided in this BA Report

APPENDIX 1	YES / NO	SECTION IN BA REPORT
Objective of the basic assessment process 2) The objective of the basic assessment process is to, through a consultative process- a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context; b) identify the alternatives considered, including the activity, location, and technology alternatives; c) describe the need and desirability of the proposed alternatives; d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the site and locations within site and the risk of impact of the proposed activity and technology alternatives on these aspects to determine- (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and (ii) the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; and e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the site and location identified through the life of the activity to- (i) identify and motivate a preferred site, activity and technology alternative; (ii) identify suitable measures to avoid, manage or mitigate identified impacts; and (iii) identify residual risks that need to be managed and monitored.	**Yes**	**Section A of the report includes the Introduction, legislative review, alternatives assessment and needs and desirability.** **Section D includes a summary of the specialist studies and associated impact assessments undertaken.**
Scope of assessment and content of basic assessment reports 3) (1) A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include: (a) details of: (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	**Yes**	**Section A.2 and Appendix E**
(b) the location of the activity, including: (i) the 21-digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	**Yes**	**Section A.1 and Appendix A**

APPENDIX 1	YES / NO	SECTION IN BA REPORT
(c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale; or, if it is- (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	**Yes**	**Section A.1 and Appendix A**
(d) a description of the scope of the proposed activity, including all listed and specified activities triggered and being applied for; and a description of the activities to be undertaken including associated structures and infrastructure;	**Yes**	**Section A.5 and Section A.10**
(e) a description of the policy and legislative context within which the development is proposed including- (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	**Yes**	**Section A.3 and A.9**
f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	**Yes**	**Section A.13**
(g) a motivation for the preferred site, activity and technology alternative;	**Yes**	**Section A.12**
(h) A full description of the process followed to reach the proposed preferred alternative within the site, including - (i) details of all the alternatives considered;	**Yes**	**Section A.12**
(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	**Yes**	**Section C**
(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	**Yes**	**Section C**
(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	**Yes**	**Section A.12 and Section B**
(v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	**Yes**	**Section A.12 and Section D**
(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	**Yes**	
(vii) positive and negative impacts that the proposed activity	**Yes**	

APPENDIX 1	YES / NO	SECTION IN BA REPORT
and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;		
(viii) the possible mitigation measures that could be applied and level of residual risk;	**Yes**	
(ix) the outcome of the site selection matrix;	**Yes**	
(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and	**Yes**	
(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity.	**Yes**	**Section A.12**
(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including- (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	**Yes**	**Executive Summary; Section D and Appendix C**
(j) 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 avoided, managed or mitigated;	**Yes**	**Section D and Appendix C**
(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	**Yes**	**Section D and Section E**
(l) an environmental impact statement which contains- (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	**Yes**	**Executive Summary, Section D, Section E and Appendix A.5**

APPENDIX 1	YES / NO	SECTION IN BA REPORT
(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr;	**Yes**	**Section D and Appendix C**
(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	**Yes**	**Section E**
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	**Yes**	**Please refer to each specialist study included in Appendix C**
(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	**Yes**	**Section E**
(q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	**X**	**Not Applicable**
(r) an undertaking under oath or affirmation by the EAP in relation to - (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and	**Yes**	**Appendix E**
(s) where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	**X**	**N/A**
(t) any specific information that may be required by the competent authority; and	**Yes**	**Appendix J**
(u) any other matters required in terms of section 24(4)(a) and (b) of the Act.	**X**	**N/A**
2) Where a government notice *gazetted* by the Minister provides for the basic assessment process to be followed, the requirements as indicated in such a notice will apply.	**Yes**	**Refer to Section A.9 for a breakdown of the relevant gazettes.**