GENESIS ENERTRAG KOUP 1 WIND FARM (PTY) LTD

Proposed Development of the Koup 1 On-site Switching / Collector Substation and associated 132kV Power Line near Beaufort West in the Western Cape Province

Draft Basic Assessment Report (DBAR)

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Author:	Michelle Guy (EAP) *Pr.Sci.Nat Reg No. 126338* *EAPASA Reg No. 2019/868* *Katherine Wiles* *Cert.Nat.Sci Reg No: 300205/15*
Checked by:	Michelle Nevette *Cert.Nat.Sci Reg No. 120356* *EAPASA Reg No. 2019/1560*
Approved by:	Michelle Nevette *Cert.Nat.Sci Reg No. 120356* *EAPASA Reg No. 2019/1560*
Signature:	
Client:	Genesis Enertrag Koup 1 Wind Farm (Pty) Ltd

Confidentiality Statement

KEY PROJECT INFORMATION

TECHNICAL DETAILS:

Component	Description / Dimensions
Project Location	The proposed development is located approximately 55 km south of the town of Beaufort West, within the Beaufort West and Prince Albert Local Municipalities, in the Central Karoo District Municipality of the Western Cape Province
Generation Capacity of Substation	33/132kV
Affected Properties	• Portion 1 of the Farm Trakas Kuilen No. 15; • Portion 11 of the Farm Brits Eigendom No. 374; • Portion 24 of the farm Brits Eigendom No. 374.
SG Codes	• C06100000000001500001 • C09000000000037400011 • C09000000000037400024
Area occupied by Substation	Up to approximately 1.5 hectares.
Height of Substation	Height of substation will be confirmed during the final design stages of the substation, prior to construction commencing
Site Access	Access to the proposed development (substation application site) will be via an existing gravel road.
Construction laydown area	One (1) construction laydown / staging area of up to approximately 2.25ha. It should be noted that no construction camps will be required in order to house workers overnight as all workers will be accommodated in the nearby town.
Operation and Maintenance building	One (1) permanent Operation and Maintenance (O&M) building, including an on-site spares storage building, a workshop and an operations building to be located on the site identified for the construction laydown area.
Fencing	No new fencing is envisaged at this stage. Current fencing is standard farm fence approximately 1-1.5m in height. Fencing might be upgraded (if required) to be up to approximately 2m in height.
Grid Connection Information	▪ One (1) new 33/132kV on-site substation and/or collector substation, occupying an area of up to approximately 1.5 ha, and; ▪ One (1) new 132kV overhead power line connecting the on-site and/or collector substation either to an off-site collector substation, or via a direct tie-in to the existing 400kV overhead power lines and thereby feeding the electricity into the national grid. Power line towers being considered for this development include self-supporting suspension monopole structures for relatively straight sections of the line and angle strain towers where the route alignment bends to a significant degree. Maximum tower height is expected to be approximately 25m.

COORDINATES OF PREFERRED ALTERNATIVES

KOUP 1 GRID CONNECTION COORDINATES				
CORRIDOR ALTERNATIVE	**START POINT**	**MIDDLE POINT**	**END POINT**	**APPROX LENGTH (KM)**
OPTION 2	S32° 52' 42.085"	S32° 54' 51.470"	S32° 57' 6.005"	9.90
	E22° 32' 1.356"	E22° 31' 55.475"	E22° 32' 15.187"	

KOUP 1 ON-SITE AND COLLECTOR SUBSTATION COORDINATES AT CENTRE POINT		
SITE ALTERNATIVE	**SOUTH**	**EAST**
ON-SITE SUBSTATION OPTION 1	*S32° 52' 42.085"*	*E22° 32' 1.356"*
COLLECTOR SUBTATION OPTION 2	S32° 57' 6.005"	E22° 32' 15.187"

The final design details of the proposed substation and power line will become available during the detailed design phase of the proposed development, before construction commences.

All maps included in the report are included in **Appendix 5**.

GENESIS ENERTRAG KOUP 1 WIND FARM (PTY) LTD

DRAFT BASIC ASSESSMENT REPORT

EXECUTIVE SUMMARY

INTRODUCTION AND PROJECT DESCRIPTION

Genesis Enertrag Koup 1 Wind Farm (Pty) Ltd (hereafter referred to as 'Genesis') is proposing to develop one (1) new 33/132kV on-site substation and/or collector substation as well as one (1) new associated 132kV overhead power line for the proposed Koup 1 Wind Energy Facility (WEF) (part of a separate Environmental Impact Assessment (EIA) process / application: **DFFE Reference Number: 14/12/16/3/3/2/2120**), near the town of Beaufort West in the Western Cape Province of South Africa (hereafter referred to as the 'proposed development') (**Figure below)**. The overall objective of the proposed development is to feed the electricity generated by the proposed Koup 1 WEF into the national grid. The grid connection and 33/132kV on-site substation and/or collector substation (this application) requires a separate Environmental Authorisation (EA), in order to allow the EA as well as the proposed infrastructure to be handed over to Eskom.

The Basic Assessment (BA) for the proposed development will be conducted in terms of the EIA Regulations, 2014 (as amended) promulgated in terms of Chapter 5 of the NEMA. In terms of these regulations, the proposed overhead power line and 33/132kV on-site switching substation / collector substation would be subject to a BA process in terms of the NEMA) (as amended) and Appendix 1 of the EIA Regulations, 2014 (as amended). All relevant legislation and guidelines will be consulted during the BA process and will be complied with at all times.

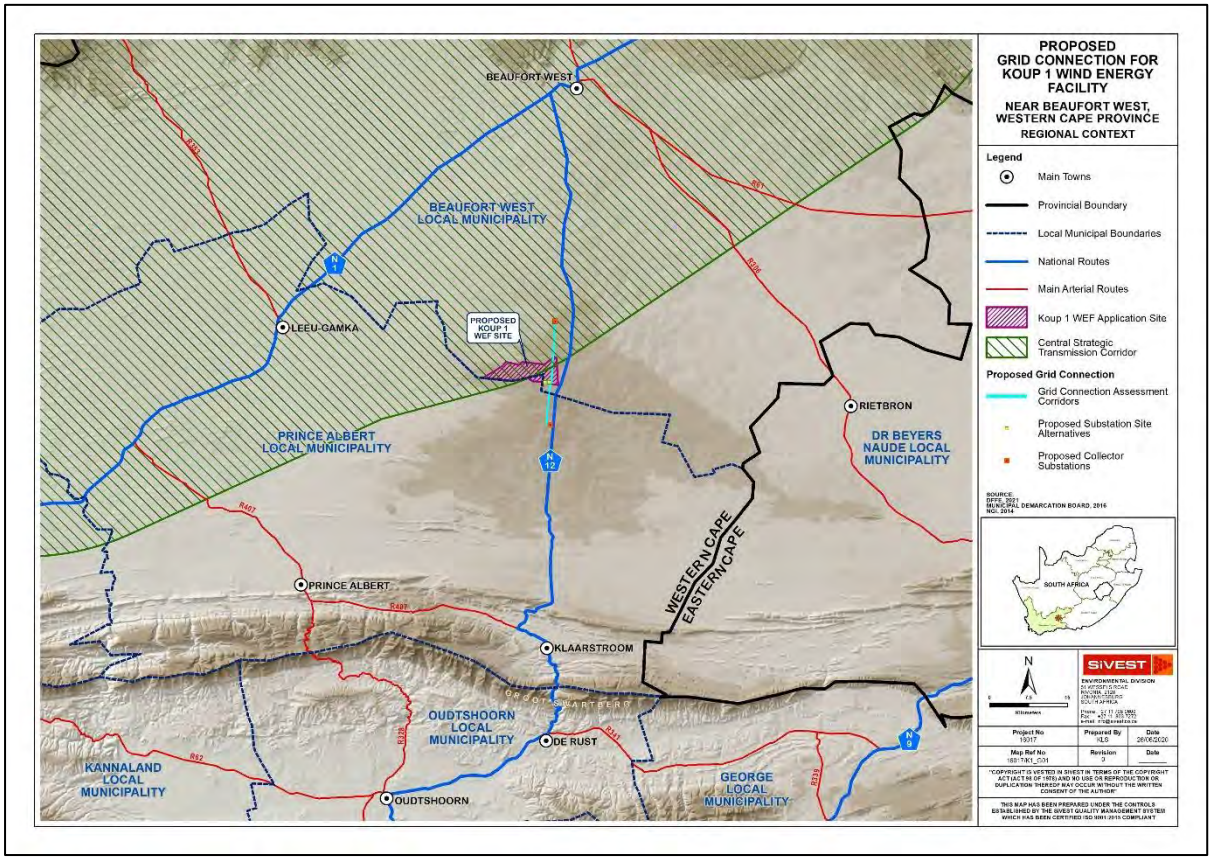
This report forms part of one (1) of two (2) grid connection infrastructure developments (namely on-site and/or collector substations and overhead power lines) that are being proposed on nearby properties by Genesis. In addition, two (2) WEF developments are also being proposed on adjacent properties by Genesis. The other proposed developments (i.e. WEF, substation and power line) which are being proposed on nearby properties by Genesis include the following:

- Koup 1 WEF – **DFFE Reference Number:** 14/12/16/3/3/2/2120 (part of a separate EIA process / application);
- Koup 2 WEF – **DFFE Reference Number:** 14/12/16/3/3/2/2121 (part of a separate EIA process / application); and
- Koup 2 Substation and Power Line – **DFFE Reference Number:** To be Allocated (part of separate BA process / application).

The grid connection infrastructure which is part of this application is being proposed to feed the electricity generated by the Koup 1 WEF into the national grid. It should be noted that the proposed grid connection infrastructure will be handed over to Eskom once constructed. The on-site and/or collector substation will include an Eskom portion and an Independent Power Producer (IPP) portion, hence the substation has been included in the WEF EIA (part of separate application) and in this associated grid connection infrastructure Basic Assessment (BA) (part of this application) to allow for handover to Eskom. Following construction, the substation will be owned and managed by Eskom. The current

applicant will remain in control of the low voltage components (more specifically the 33kV yard) of the substation, while the high voltage components (i.e. 132kV components) of the substation will likely be ceded to Eskom shortly after the completion of construction.

Although the WEF (part of separate application) and associated grid connection infrastructure (part of this application) will be assessed separately, a single public participation process is being undertaken to consider all of the proposed developments [i.e. two (2) WEF EIAs and two (2) grid connection infrastructure BAs]. The potential environmental impacts associated with the proposed development have been assessed as part of the cumulative impact assessment.



APPLICABILITY OF NEMA EIA REGULATIONS, 2014 (AS AMENDED IN 2017)

The amended EIA Regulations promulgated under Section 24(5) of the National Environmental Management Act, Act 107 of 1998 and published in Government Notice No. R. 326 list activities which may not commence without environmental authorization from the Competent Authority. The proposed activity is identified in terms of Government Notice No. R. 327, and 324 for activities which must follow a Basic Assessment Process. The project will trigger the following listed activities in the table below:

Activity No(s):	Relevant activities as set out in Listing Notices 1, 2 and 3 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
Relevant Basic Assessment Activities as set out in Listing Notice 1		

Activity No(s):	Relevant activities as set out in Listing Notices 1, 2 and 3 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
11 (i)	**GN R. 327 (as amended) Item 11:** The development of facilities or infrastructure for the transmission and distribution of electricity— (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.	One (1) new on-site substation and/or collector substation will be constructed within the proposed application site as part of the proposed development. The proposed substation will be located outside urban areas and will have a capacity of 33/132kV (33kV yard subject to this BA / application). In addition, the substation will occupy a footprint of up to approximately 1 hectares (ha) (10 000m^2). The proposed development will also involve the construction of one (1) overhead power line which will be located outside an urban area. The proposed power line will have a capacity of 132kV. These proposed power line will be located outside an urban area.
12 (ii) (a) (c)	**GN R. 327 (as amended) Item 12:** The development of: ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs- (a) within a watercourse; (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.	Maintenance access tracks (that do not trigger Listing Notice 1 Activity) associated with the proposed Power lines will cross watercourses. The proposed development will entail the construction of an overhead power line. The power line will traverse some of the surface water features / watercourses identified and/or be located within 32m of some of the surface water features / watercourses identified.
19	**GN R. 327 (as amended) Item 19**: The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;	Although the layout of the proposed development has been designed to avoid the identified surface water features / watercourses as far as possible, parts of the proposed overhead power line will need to traverse some of the identified surface water features / watercourses. In addition, during construction of the overhead power line, soil will need to be removed from some of the identified surface water features / watercourses.
24 (ii)	**GN R. 327 (as amended) Item 24:** The development of a road - ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres.	Internal roads are required within the application site in order to provide access to the on-site and/or collector substation. Roads are also required in order to access the proposed overhead power line. Existing site roads will be used wherever possible, although new site roads will be constructed where necessary. As such, the proposed development will involve the construction of new internal roads within the application site as well as the properties traversed by the power line corridor route alternatives, as required. It is proposed that these new internal access roads will be between approximately 8m and 10m wide.
27 (i)	**GN R. 327 (as amended) Item 27:** The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation.	The proposed development involves the construction of one (1) new on-site and/or collector substation which will occupy an area of approximately 1,5ha. All vegetation on the substation site will need to be cleared for construction. Cleared vegetation will amount to an area of up to approximately 1,5ha.

Activity No(s):	Relevant activities as set out in Listing Notices 1, 2 and 3 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
28 (ii)	**GN R. 327 (as amended) Item 28:** Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;	The proposed development site is currently zoned for agricultural land use, and the area to be developed will be larger than 1ha.
31 (i)	**GN R. 327 (as amended) Item 31:** The decommissioning of existing facilities, structures or infrastructure for - (i) any development and related operation activity or activities listed in this Notice, Listing Notice 2 of 2014 or Listing Notice 3 of 2014;	Should the proposed development's Power Purchase Agreement (PPA) not be renewed after 20 years (anticipated operational lifespan of proposed development), the proposed development would need to be decommissioned. This would include the decommissioning of the on-site and/or collector substation as well as the overhead power line connecting the substation to the national grid.
48 (i) (a) (c)	**GN R. 327 (as amended) Item 48:** The expansion of- (i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; where such expansion occurs— (a) within a watercourse; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;	The proposed project will most likely entail the expansion (upgrading) of roads and other infrastructure by 100m^2 or more within a surface water feature / watercourse or within 32 m from the edge of a surface water feature / watercourse.
56 (ii)	**GN R. 327 Item 56:** The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre - (ii) where no reserve exists, where the existing road is wider than 8 metres –	Internal roads are required within the application site in order to provide access to the on-site and/or collector substation. Roads are also required in order to access the proposed overhead power line. Existing internal roads may require widening by more than 6m, or by lengthening them by more than 1km.
Relevant Scoping and EIA Activities as set out in Listing Notice 2 of the EIA Regulations, 2014 as amended		
None		
Relevant Basic Assessment Activities as set out in Listing Notice 3 of the EIA Regulations, 2014 as amended		
4 i. (ii) (aa)	**GN R. 324 (as amended) Item 4:** The development of a road wider than 4 metres with a reserve less than 13,5 metres. **i. Western Cape** ii. Areas outside urban areas; (aa) Areas containing indigenous vegetation;	The proposed project is likely to require the development of roads wider than 4m with a reserve of less than 13.5m in areas containing indigenous vegetation. Internal access roads with a width of between approximately 8m and 10m wide will provide access to the substation and proposed overhead power line. These roads will occur within the Western Cape Province, outside urban areas.
12 i. ii.	**GN R. 324 (as amended) Item 12:** The clearance of an area of 300 square metres or more of indigenous vegetation **i. Western Cape**	The proposed development will transform more than 300m2 of indigenous vegetation. Part of the power line corridor route alternative 3 traverses a Critical Biodiversity Area (CBA) 1 area in the north-eastern corner of the Koup 1 WEF application site. Clearance will thus occur within a CBA.

Activity No(s):	Relevant activities as set out in Listing Notices 1, 2 and 3 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
	ii. Within critical biodiversity areas identified in bioregional plans;	
14 (ii) (a) (c); i. i. (ff)	**GN R. 985 (as amended) Item 14:** The development of – (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs – (a) within a watercourse; (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; **i. Western Cape** i. Outside urban areas: (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or inbioregional plans;	The proposed development will entail the construction of an on-site and/or collector substation as well as associated overhead power line and roads with a physical footprint of 10m^2 or more. The proposed substation will occupy an area of up to approximately 1.5ha. The proposed substation will avoid the surface water features / watercourses identified within the application site where possible, although the power line and/or internal and access roads will traverse some of the surface water features / watercourses identified and/or be located within 32m of some of the surface water features / watercourses identified. The proposed development will be located outside an urban area. In addition, part of the power line corridor route alternatives traverse a Critical Biodiversity Area (CBA)/Ecological Support Area (ESA).
18 i. ii. (aa)	**GN R. 324 (as amended) Item 18:** The widening of a road by more than 4 meters, or the lengthening of a road by more than 1 kilometer- **i. Western Cape** ii. All areas outside urban areas: (aa) Areas containing indigenous vegetation	Internal roads are required within the application site in order to provide access to the on-site and/or collector substation. Roads are also required in order to access the proposed overhead power line. Existing site roads will be used wherever possible, although new site roads will be constructed where necessary. Existing internal roads will thus need to be upgraded as part of the proposed development (where required). Internal roads will be widened by more than 4m or lengthened by more than 1km. These roads located within the application site will occur within the Western Cape Province, outside urban areas. In addition, the properties affected by the proposed development contain indigenous vegetation.
23 (ii) (a) (c); i. i. (ff)	**GN R. 324 (as amended) Item 23:** The expansion of – (ii) infrastructure or structures where the physical footprint is expanded by 10 square metres or more; where such expansion occurs – (a) within a watercourse; (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; **i. Western Cape** i. Outside urban areas: (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans	The proposed development will entail the development and expansion of roads by 10m^2 or more within a watercourses or within 32m from the edge of a watercourses. The proposed development will be located outside an urban area. In addition, part of the power line corridor route alternatives traverse a Critical Biodiversity Area (CBA)/Ecological Support Area (ESA).

Activity No(s):	Relevant activities as set out in Listing Notices 1, 2 and 3 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
	adopted by the competent authority or in bioregional plans;	

DETAILS OF ALTERNATIVES CONSIDERED

Only two site alternatives for the proposed development are being considered as the placement of the proposed substation is dependent on the location of the proposed Koup 1 WEF.

Substation

1. ***Substation Site Alternative 1:*** is located within close proximity to the site access point for the proposed Koup 1 WEF on Portion 11 of the Farm Brits Eigendom No. 374 (part of separate application), and is approximately 2.3km west of the N12 National Road; and
2. ***Substation Site Alternative 2:*** is located within close proximity to the site access point for the proposed Koup 1 WEF on Portion 11 of the Farm Brits Eigendom No. 374 (part of separate application), and is approximately 3.1km west of the N12 National Road.

One (1) type of activity is therefore considered (namely 132kV overhead power line and on-site switching substation and/or combined collector substation) in order to feed the electricity / energy generated from a renewable source of energy, wind energy (namely the Koup 1 WEF), into the national electricity grid.

Layout alternatives have been considered and assessed as part of the BA process.

Three (3) power line corridor route alignments (and associated collector substations) are being considered and have been comparatively assessed by the EAP and specialists within a 300m wide assessment corridor (150m on either side of power line) as follows:

1. ***Power* Line Corridor Option 1:** is approximately 1.3km in length, linking either substation / collector Option 1 or Option 2 (see above) to the existing 400kV transmission lines;
2. ***Power* Line Corridor Option 2:** is approximately 9.9km in length, linking either substation / collector Option 1 or Option 2 (see above) to a proposed Collector Substation to the south, adjacent to the existing 400kV transmission lines; and
3. ***Power* Line Corridor Option 3:** is approximately 12.9km in length, linking either substation / collector Option 1 or Option 2 (see above) to a proposed Collector Substation to the north, adjacent to the existing 400kV transmission lines.

All substation site alternatives and power line route alternatives were extensively investigated and comparatively assessed (refer to **Section 14.1.6**). In addition, the proposed development has been assessed against the 'no-go' alternative (i.e. status quo).

SPECIALIST STUDIES

The following specialist assessments were conducted as part of the BA process in order to identify and assess the issues associated with the proposed development:

- Visual Impact Assessment

- Transportation Impact Assessment
- Heritage Impact Assessment
- Palaeontological Impact Assessment
- Archaeological Assessment
- Cultural Landscape Assessment
- Desktop Geotechnical Assessment
- Agriculture and Soils Impact Assessment (desktop)
- Social Impact Assessment (desktop)
- Surface Water Impact Assessment
- Biodiversity Impact Assessment
- Avifaunal Impact Assessment
- Avifaunal Impact Assessment

These studies were undertaken to inform the impact assessment of the proposed grid development. The specialists assessed the relevant alternatives as part of their respective assessments and also focused on specific impacts of the proposed grid infrastructure development in detail. The table below summarises the specialist findings for the entire proposed development both pre and post mitigation.

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST MITIGATION
Planning Phase			
Archaeological	Damage to two historical farmsteads/structures (Kh001 and Kh001b) which are located within the proposed grid corridor area.	Medium Negative Impact	Low Negative Impact
Archaeological	Due to the size of the area assessed, there's a possibility of encountering unidentified heritage features in un-surveyed areas does exist.	Medium Negative Impact	Low Negative Impact
Cultural: Ecological	Inappropriate infrastructure layout planning degrades ecological elements of the cultural landscape.	Medium Negative Impact	Low Negative Impact
Cultural: Aesthetic	Inappropriate infrastructure layout planning negates aesthetic and sense of place requirements of the cultural landscape.	High Negative Impact	Medium Negative Impact
Cultural: Historic	Inappropriate infrastructure layout planning degrades historic elements of the cultural landscape.	Medium Negative Impact	Low
Cultural: Socio-economic	Non-landowner residents' lack of representation in planning and public participation process leads to loss of local knowledge, socio-economic empowerment and character of the cultural landscape.	Medium Negative Impact	Low Negative Impact
Construction Phase			
Avifauna	Displacement of priority species due to habitat destruction in the substation footprint	Low Negative Impact	Low Negative Impact

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST MITIGATION
Avifauna	Displacement of priority species due to disturbance associated with the construction activities	Medium Negative Impact	Low Negative Impact
Cultural: Ecological	Fragmentation and destruction of the landscape degrading the environment and thus continuous relationship between man and environment	High Negative Impact	Low Negative Impact
Cultural: Aesthetic	Gridline infrastructure construction and decommissioning activity degrades the character of the cultural landscape and the sense of place	High Negative Impact	Medium Negative Impact
Cultural: Historic	Integrity of farmsteads and farm roads degraded by insensitive construction or decommissioning activities.	High Negative Impact	Low Negative Impact
Cultural: Socio-economic	Integrity of local residents to continue their patterns of land use is degraded by the construction and decommissioning activities.	Very High Negative Impact	Low Positive Impact
Biodiversity: Vegetation	Vegetation clearing for access roads, turbines and their service areas and other infrastructure will impact on vegetation and protected plant species.	Medium Negative Impact	Low Negative Impact
Biodiversity: Fauna	Disturbance, transformation and loss of habitat will have a negative effect on resident fauna during construction. Due to noise and operation of heavy machinery, faunal disturbance will extend well beyond the footprint and extend into adjacent areas. This will however be transient and restricted to the construction phase.	Medium Negative Impact	Low Negative Impact
Geotechnical: Removal of subsoils (soil, rock)	Displacement of natural earth material and overlying vegetation. 1) Increase stormwater velocity. 2) Increase in soil and wind erosion due to clearing of vegetation. 3) Construction and earthmoving vehicles may displace soil during operations. 4) Creation of drainage paths along access tracks. 5) Potential oil spillages from heavy plant. 6) Sedimentation of non-perennial features and excessive dust. 7) Potential groundwater and drainage feature contamination.	Low Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase in Traffic	Low Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase of Incidents with pedestrians and livestock	Medium Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase in Dust from gravel roads	Low Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase in Road Maintenance	Low Negative Impact	Low Negative Impact

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST MITIGATION
Transportation: Abnormal Loads	Additional Abnormal Loads	Low Negative Impact	Low Negative Impact
Transportation: Access Roads	Increase in dust from gravel roads	Low Negative Impact	Low Negative Impact
Transportation: Access Roads	New/Larger Access points	Low Negative Impact	Low Negative Impact
Visual: 1. Potential alteration of the visual character and sense of place. 2. Potential visual impact on receptors in the study area	• Large construction vehicles, equipment and construction material stockpiles will alter the natural character of the study area and expose visual receptors to impacts associated with construction. • Construction activities may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings. • Dust emissions and dust plumes from increased traffic on gravel roads serving the construction site may evoke negative sentiments from surrounding viewers. • Surface disturbance during construction would expose bare soil resulting in visual scarring of the landscape and increasing the level of visual contrast with the surrounding environment. • Vegetation clearance required for the construction of the proposed substation is expected to increase dust emissions and alter the natural character of the surrounding area, thus creating a visual impact. • Temporary stockpiling of soil during construction may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.	Low Negative Impact	Low Negative Impact
Surface Water: Loss of aquatic species of special concern	During construction activities within watercourses could result in the disturbance or destruction of any listed and or protected plant or animal species. However none of these aquatic obligate species were observed during this assessment	Low Negative Impact	Low Negative Impact
Surface Water: Damage or loss of riparian and or drainage line systems i.e. disturbance of the waterbodies in the construction phase	Construction could result in the loss of drainage systems that are fully functional and provide an ecosystem services within the site especially where new access roads are required or road upgrades will widen any current bridges or drifts. Loss can also include a functional loss, through change in vegetation type via alien encroachment for example	Medium Negative Impact	Low Negative Impact
Surface Water: Potential impact on localised surface water quality (construction materials and fuel storage facilities) during the construction and decommissioning phases	During construction earthworks will expose and mobilise earth materials, and a number of materials as well as chemicals will be imported and used on site and may end up in the surface water, including soaps, oils, grease and fuels, human wastes, cementitious wastes, paints and solvents, etc. Any spills during transport or while works area conducted in proximity to a watercourse has the potential to affect the surrounding biota. Leaks or spills from storage facilities also pose a risk and due consideration to the safe design and management of the 30 000l fuel storage facility must be given. Although unlikely, consideration must also be provided for the proposed Battery Energy Storage System (BESS), with	Medium Negative Impact	Low Negative Impact

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST MITIGATION
	regard safe handling during the construction phase. This to avoid any spills or leaks from this system		
Socio-Economic: Health and social wellbeing	Air Quality	Low Negative Impact	Low Negative Impact
Socio-Economic: Health and social wellbeing	Noise	Low Negative Impact	Low Negative Impact
Socio-Economic: Health and social wellbeing	Increase in crime	Low Negative Impact	Low Negative Impact
Socio-Economic: Health and social wellbeing	Increased risk of HIV infections	High Negative Impact	Medium Negative Impact
Socio-Economic: Health and social wellbeing	Influx of construction workers	Low Negative Impact	Low Negative Impact
Socio-Economic: Health and social wellbeing	Hazard Exposure	Low Negative Impact	Low Negative Impact
Socio-Economic: Quality of the living environment	Disruption of daily living patterns	Low Negative Impact	Low Negative Impact
Socio-Economic: Quality of the living environment	Disruptions to social and community infrastructure	Low Negative Impact	Low Negative Impact
Socio-Economic: Economic	Job creation and skills development	Medium Positive Impact	Medium Positive Impact
Socio-Economic: Economic	Socio-economic stimulation.	Medium Positive Impact	Medium Positive Impact
Palaeontological: Fossil heritage resources	Disturbance, damage or destruction of fossils at or beneath the ground surface due to surface clearance and bedrock excavations	Medium Negative Impact	Low Negative Impact
Operational Phase			
Avifauna	Mortality of priority species due to collisions with the 132kV OHL	Medium Negative Impact	Medium Negative Impact
Cultural: Ecological	Inappropriate operational activities degrade the significant ecological elements of the cultural landscape	High Negative Impact	Low Negative Impact

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST MITIGATION
Cultural: Aesthetic	Inappropriate operational activities degrade the significant aesthetic elements of the cultural landscape altering the character and sense of place	High Negative Impact	Medium Negative Impact
Cultural: Historic	Inappropriate operational activities degrade the significant historic elements of the cultural landscape altering the character and sense of place	Very High Negative Impact	Medium Negative Impact
Cultural: Socio-economic	Inappropriate operational activities degrade the significant socio-economic opportunities of the cultural landscape	Very High Negative Impact	Medium Positive Impact
Biodiversity (Fauna)	Faunal disturbance and habitat degradation .The operation and presence of the power line may lead to disturbance or persecution of fauna during maintenance activities.	Low Negative Impact	Low Negative Impact
Biodiversity (Increased potential for soil erosion)	Disturbance created during construction will leave the site and its immediate surroundings vulnerable to erosion and alien plant invasion for several years into the operational phase	Medium Negative Impact	Low Negative Impact
Biodiversity (Vegetation)	Ecological degradation due to alien plant invasion	Medium Negative Impact	Low Negative Impact
Biodiversity (Negative impact on ESAs, CBAs and broad-scale ecological processes).	Transformation and presence of the grid connection and associated infrastructure will contribute to cumulative habitat loss within CBAs, ESAs and impact on broad-scale ecological processes such as fragmentation.	Medium Negative Impact	Low Negative Impact
Geotechnical: Removal of subsoils (soil, rock)	Displacement of natural earth material. 1) Increase in soil erosion. 2) Potential oil spillages from maintenance vehicles. 3) Sedimentation of non-perennial features caused by soil erosion.	Low Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase in Traffic	Low Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase of Incidents with pedestrians and livestock	Low Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase in Dust from gravel roads	Low Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase in Road Maintenance	Low Negative Impact	Low Negative Impact
Transportation: Abnormal Loads	Additional Abnormal Loads	Low Negative Impact	Low Negative Impact
Transportation: Internal Access Roads	New/Larger Access points	Low Negative Impact	Low Negative Impact

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST MITIGATION
Visual: • Potential alteration of the visual character and sense of place. • Potential visual impact on receptors in the study area.	• The proposed power line and substation could alter the visual character of the surrounding area and expose sensitive visual receptor locations to visual impacts. • The development may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings. • Dust emissions and dust plumes from maintenance vehicles accessing the site via gravel roads may evoke negative sentiments from surrounding viewers. • The night time visual environment could be altered as a result of operational and security lighting at the proposed substation.	Low Negative Impact	Low Negative Impact
Surface Water: Impact on aquatic systems through the possible increase in surface water runoff on form and function during the operational phase	Increase in hard surface areas, and roads that require stormwater management will increase through the concentration of surface water flows that could result in localised changes to flows (volume) that would result in form and function changes within aquatic systems, which are currently ephemeral. This then increases the rate of erosions and sedimentation of downstream areas.	Medium Negative Impact	Low Negative Impact
Socio-Economic: Health and social wellbeing	Electromagnetic field and RF interference	Low Negative Impact	Low Negative Impact
Socio-Economic: Health and social wellbeing	Hazard exposure	Low Negative Impact	Low Negative Impact
Socio-Economic: Quality of the living environment	Transformation of the sense of place	High Negative Impact	High Negative Impact
Socio-Economic: Economic	Job creation and skills development	Medium Positive Impact	Medium Positive Impact
Socio-Economic: Economic	Socio-economic stimulation.	Medium Positive Impact	Medium Positive Impact
Decommissioning Phase			
Avifauna	Displacement due to disturbance associated with the dismantling of the grid connection.	Low Negative Impact	Low Negative Impact
Cultural: Ecological	Fragmentation and destruction of the landscape degrading the environment and thus continuous relationship between man and environment	High Negative Impact	Low Negative Impact
Cultural: Aesthetic	Gridline infrastructure construction and decommissioning activity degrades the character of the cultural landscape and the sense of place	High Negative Impact	Medium Negative Impact
Cultural: Historic	Integrity of farmsteads and farm roads degraded by insensitive construction or decommissioning activities.	High Negative Impact	Low Negative Impact

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST MITIGATION
Cultural: Socio-economic	Integrity of local residents to continue their patterns of land use is degraded by the construction and decommissioning activities.	Very High Negative Impact	Low Positive Impact
Biodiversity (Fauna)	Due to disturbance, noise and the operation of heavy machinery, faunal disturbance due to decommissioning will extend beyond the footprint and impact adjacent areas to some degree. This will however be transient and restricted to the period while machinery is operational. In the long term, decommissioning should restore the ecological functioning and at least some habitat value to the affected areas.	Low Negative Impact	Low Negative Impact
Biodiversity (Increased potential for soil erosion)	Following decommissioning, the site will be highly vulnerable to soil erosion due to the disturbance created by the removal of infrastructure from the site.	Medium Negative Impact	Low Negative Impact
Biodiversity (Increased potential for alien plant Invasion)	Disturbance created during decommissioning will leave the site vulnerable to erosion and alien plant invasion for several years.	Medium Negative Impact	Low Negative Impact
Geotechnical: Removal of subsoils (soil, rock)	Decommissioning of the structure will disturb the geological environment. 1) Increase in soil and wind erosion due to clearance of structures. 2) Construction and earthmoving vehicles will displace the soil. 3) Creation of drainage paths. 4) Potential oil spillages from vehicles. 5) Excessive sediments in non-perennial features.	Medium Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase in Traffic	Low Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase of Incidents with pedestrians and livestock	Medium Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase in Dust from gravel roads	Low Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase in Road Maintenance	Low Negative Impact	Low Negative Impact
Transportation: Abnormal Loads	Additional Abnormal Loads	Low Negative Impact	Low Negative Impact
Transportation: Internal Access Roads	Increase in dust from gravel roads	Low Negative Impact	Low Negative Impact
Transportation: Internal Access Roads	New/Larger Access points	Low Negative Impact	Low Negative Impact

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST MITIGATION
Visual: • Potential visual intrusion resulting from vehicles and equipment involved in the decommissioning process; • Potential visual impacts of increased dust emissions from decommissioning activities and related traffic; and • Potential visual intrusion of any remaining infrastructure on the site.	• Vehicles and equipment required for decommissioning will alter the natural character of the study area and expose visual receptors to visual impacts. • Decommissioning activities may be perceived as an unwelcome visual intrusion. • Dust emissions and dust plumes from increased traffic on the gravel roads serving the decommissioning site may evoke negative sentiments from surrounding viewers. • Surface disturbance during construction would expose bare soil resulting in visual scarring of the landscape and increasing the level of visual contrast with the surrounding environment. • Temporary stockpiling of soil during decommissioning may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.	Low Negative Impact	Low Negative Impact
Surface Water: Loss of aquatic species of special concern	During construction/decommissioning activities within watercourses could result in the disturbance or destruction of any listed and or protected plant or animal species. However none of these aquatic obligate species were observed during this assessment	Low Negative Impact	Low Negative Impact
Surface Water: Damage or loss of riparian and or drainage line systems i.e. disturbance of the waterbodies in the construction phase	Construction/decommissioning could result in the loss of drainage systems that are fully functional and provide an ecosystem services within the site especially where new access roads are required or road upgrades will widen any current bridges or drifts. Loss can also include a functional loss, through change in vegetation type via alien encroachment for example	Medium Negative Impact	Low Negative Impact
Surface Water: Potential impact on localised surface water quality (construction materials and fuel storage facilities) during the construction and decommissioning phases	During construction/decommissioning earthworks will expose and mobilise earth materials, and a number of materials as well as chemicals will be imported and used on site and may end up in the surface water, including soaps, oils, grease and fuels, human wastes, cementitious wastes, paints and solvents, etc. Any spills during transport or while works area conducted in proximity to a watercourse has the potential to affect the surrounding biota. Leaks or spills from storage facilities also pose a risk and due consideration to the safe design and management of the 30 000l fuel storage facility must be given. Although unlikely, consideration must also be provided for the proposed Battery Energy Storage System (BESS), with regard safe handling during the construction phase. This to avoid any spills or leaks from this system	Medium Negative Impact	Low Negative Impact
Socio-Economic	Considering a time period of 20 years prior to decommissioning and the dynamics of social variables, it would be rather meaningless to attach assessment criteria to decommissioning at this point due to the high level of uncertainty such assessment would be based upon.		
Cumulative			

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST MITIGATION
Archaeological Impacts: Heritage resources	(1) The extent that the addition of this project will have on the overall impact of developments in the region on heritage resources.	Medium Negative Impact	Low Negative Impact
Avifauna	(1) Displacement of priority species due to habitat destruction in the substation footprint (2) Displacement of priority species due to disturbance associated with the construction activities. (3) Mortality of priority species due to collisions with the 132kV OHL. (4) Displacement of priority species due to disturbance associated with the decommissioning activities.	High Negative Impact	Medium Negative Impact
Biodiversity: Cumulative impacts on fauna and flora	Wind energy development in the wider area around the Koup 1 site will generate cumulative impacts on habitat loss and fragmentation for fauna and flora.	Medium Negative Impact	Low Negative Impact
Geotechnical: Removal of subsoils	None		
Transportation: Additional Traffic Generation	Increase in Traffic	Medium Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase of Incidents with pedestrians and livestock	High Negative Impact	Medium Negative Impact
Transportation: Additional Traffic Generation	Increase in Dust from gravel roads	Medium Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase in Road Maintenance	Low Negative Impact	Low Negative Impact
Transportation: Abnormal Loads	Additional Abnormal Loads	Medium Negative Impact	Low Negative Impact
Transportation: Internal Access Roads	Increase in dust from gravel roads	Medium Negative Impact	Low Negative Impact
Transportation: Internal Access Roads	New/Larger Access points	Low Negative Impact	Low Negative Impact
Visual: • Potential alteration of the visual character and sense of place in the broader area. • Potential visual impact on receptors in the study area. • Potential impact on the night time visual environment.	• Additional renewable energy and associated infrastructure developments in the broader area will alter the natural character of the study area towards a more industrial landscape and expose a greater number of receptors to visual impacts. • Visual intrusion of multiple renewable energy and infrastructure developments may be exacerbated, particularly in more natural undisturbed settings. • Additional renewable energy facilities in the area would generate additional traffic on gravel roads thus resulting in increased impacts from dust emissions and dust plumes. • The night time visual environment could be altered as a result of operational and security lighting at multiple renewable energy facilities in the broader area.	Medium Negative Impact	Medium Negative Impact

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST MITIGATION
Surface Water: Impact of various proposed wind farms and associated grid lines on the local aquatic resources	The cumulative assessment considers the various proposed renewable projects that occur within a 35km radius of this site, where the author has either been involved in the assessment of these projects (Enertrag SA) and or review of the past assessments as part of any required Water Use Licenses (Atlantic Energy Partners & Mainstream projects).	Low Negative Impact	Low Negative Impact
Socio-Economic: Health and social wellbeing	Noise	Low Negative Impact	Low Negative Impact
Socio-Economic: Health and social wellbeing	Shadow Flicker	Low Negative Impact	Low Negative Impact
Socio-Economic: Health and social wellbeing	Blade glint	Medium Negative Impact	Low Negative Impact
Socio-Economic: Health and social wellbeing	Risk of HIV and AIDS	High Negative Impact	Medium Negative Impact
Socio-Economic: Quality of the living environment	Sense of place	High Negative Impact	High Negative Impact
Socio-Economic: Quality of the living environment	Service supplies and infrastructure	Low Negative Impact	Low Negative Impact
Socio-Economic: Economic	Job creation and skills development	Medium Positive Impact	Medium Positive Impact
Socio-Economic: Economic	Socio-economic stimulation.	Very High Positive Impact	Very High Positive Impact
Palaeontological: Fossil heritage resources	Disturbance, damage or destruction of fossils at or beneath the ground surface due to surface clearance and bedrock excavations	Medium Negative Impact	Low Negative Impact
Cultural: Ecological	Inappropriate cumulative development degrade the significant ecological elements of the cultural landscape	Very High Negative Impact	Medium Negative Impact
Cultural: Aesthetic	Inappropriate cumulative development degrades the significant aesthetic elements of the cultural landscape altering the character and sense of place	Very High Negative Impact	Medium Negative Impact
Cultural: Historic	Inappropriate cumulative development degrades the significant historic elements of the cultural landscape altering the character and sense of place	Very High Negative Impact	Medium Negative Impact
Cultural: Socio-economic	Inappropriate cumulative development degrade the significant socio-economic opportunities of the cultural landscape	Very High Negative Impact	Medium Positive Impact

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST MITIGATION
No-Go			
Surface Water: Combined impact on aquatic resources	Overall, these catchment and subsequent rivers / watercourses are largely in a natural state. But present day impacts do occur in localised areas and included the following: • Erosion as a result of road crossings; • Several farm dams; and • Undersized culverts within present day road crossings. This has resulted in a slow degradation within the wetland and aquatic systems but the rate in change is not noticeable within the timeframe of this assessment. These activities are likely to continue intermitted into the future.	Low Negative Impact	Low Negative Impact
Socio-Economic: The project does not proceed.	The status quo remains in place. No positive or negative impacts occur	High Negative Impact	NA
Palaeontological: Fossil heritage resources	Disturbance, damage or destruction of fossils at or beneath the ground surface due to natural weathering and erosion	Low Negative Impact	NA

Summary of comparative assessment of substation site alternatives for 132/33kV Substation

ALTERNATIVE	ENVIRONMENTAL ASPECT													FATAL FLAW (YES / NO)	PREFERRED (YES / NO)
	Agric. and Soils	Avifauna	Bat	Terrestrial Ecology	Geotech	Archaeo	Palaeo	Cultural	Noise	Social	Surface Water	Transportation	Visual		
SUBSTATION SITE ALTERNATIVES															
Option 1	Not assessed	No Preference	Preferred	Preferred	No Preference	No Preference	No preference	Favourable	No preference	No preference	Preferred	No preference	Favourable	NO	YES
Option 2	Not assessed	No Preference	Least Preferred	Favourable	No Preference	No Preference	No preference	Least preferred	No preference	Least preferred	Favourable	No preference	Favourable	NO	NO

Summary of comparative assessment of construction laydown area

ALTERNATIVE	ENVIRONMENTAL ASPECT													FATAL FLAW (YES / NO)	PREFERRED (YES / NO)
	Agric. and Soils	Avifauna	Bat	Terrestrial Ecology	Geotech	Archaeo	Palaeo	Cultural	Noise	Social	Surface Water	Transportation	Visual		
CONSTRUCTION LAYDOWN AREA SITE ALTERNATIVES															
Option 1	Not assessed	No Preference	Preferred	Preferred	No Preference	No Preference	No preference	Favourable	No preference	No preference	No preference	No preference	Favourable	**NO**	**YES**
Option 2	Not assessed	No Preference	Least Preferred	Least Preferred	No Preference	No Preference	No preference	Least Preferred	No preference	Least preferred	No preference	No preference	Favourable	**NO**	**NO**

Summary of comparative assessment of power line corridors

ALTERNATIVE	ENVIRONMENTAL ASPECT													FATAL FLAW (YES / NO)	PREFERRED (YES / NO)
	Agric. and Soils	Avifauna	Bat	Terrestrial Ecology	Geotech	Archaeo	Palaeo	Cultural	Noise	Social	Surface Water	Transportation	Visual		
POWER LINE CORRIDOR ROUTE ALTERNATIVES															
Option 1 A/B	Not assessed	Preferred	Not assessed	Preferred	No Preference	No Preference	Preferred	Favourable	Not assessed	Favourable	Preferred	Not assessed	Preferred	**NO**	**YES**

ALTERNATIVE	ENVIRONMENTAL ASPECT													FATAL FLAW (YES / NO)	PREFERRED (YES / NO)
	Agric. and Soils	Avifauna	Bat	Terrestrial Ecology	Geotech	Archaeo	Palaeo	Cultural	Noise	Social	Surface Water	Transportation	Visual		
Option 2 A/B	Not assessed	Favourable	Not assessed	Favourable	No Preference	No Preference	Least Preferred	Least Preferred	Not assessed	Least Preferred	Preferred	Not assessed	Favourable	**NO**	**NO**
Option 3 A/B	Not assessed	Least Preferred	Not assessed	Least Preferred	No Preference	No Preference	Least Preferred	Least Preferred	Not assessed	Least Preferred	Preferred	Not assessed	Favourable	**NO**	**NO**

No activity alternatives are being considered. Renewable Energy development in South Africa is highly desirable from a social, environmental and development point of view. Wind energy installations are more suitable for the site because of the high wind resource. The choice of technology selected for the Koup 1 WEF and grid was based on environmental constraints and technical and economic considerations.

The site locations have been based on proximity to the WEF and the preliminary layout (and options) have been assessed by the specialists in their respective specialist studies. All specialists sensitivities have been taken into consideration when determining the preferred option to take forward for approval.

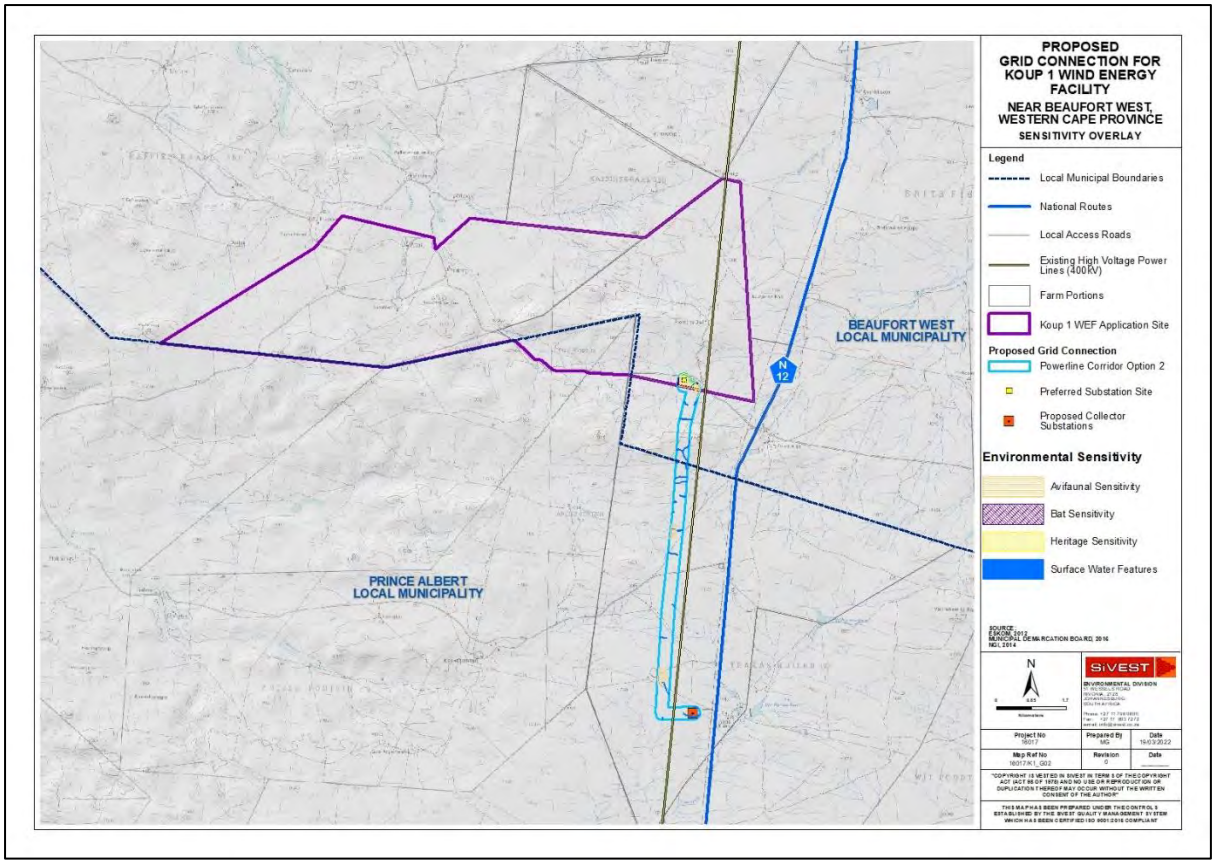
Based on the results of the comparative assessment of substation site alternatives and the construction laydown area options, the substation Option 1 and construction laydown area Option 1 is preferred. However, both are deemed acceptable for authorisation since none are fatally flawed. It is therefore requested that **Substation Option 1** and **Construction Laydown Area Option 1 be authorised** as part of the proposed development since this is the preferred option (should the EA be granted). While the cultural specialist identified Substation Option 1 and Construction Laydown Option 1 as favorable, the specialist stated that this infrastructure should be located on the same side of the road and outside of the 300m farm road buffer. This is currently not the case. The location of the Substation and Construction laydown areas are constrained by a number of sensitivities as well as riverine habitat and the most feasible option has been selected.

In terms of the powerline options, powerline Option 1 has been ruled out as an unfeasible option as Eskom will not permit two collectors within a small radius. Similarly, powerline Option 3 has also been ruled out as an unfeasible option as a result of the bird nests on powerline tower 108 and the 2.5 km no development buffer. Therefore, the only feasible option is powerline Option 2.

The results of the comparative assessment undertaken by the specialists for the power line alternatives resulted in power line Option 1 as the most preferred from a biophysical point of view as it is the shortest option, followed by Option 2. Option 3 was the least preferred. The heritage specialists (CLA specialist and PIA specialist) identified Options 2 and 3 being their least preferred as these options will increase the clutter and degradation of the rural cultural landscape along the N12 scenic route. Powerline Option 2 is however located outside of the 1 km buffer that the cultural specialist recommended (the powerline is between 1.2km and 1.5km away from the N12). The infrastructure that is within the 1 km buffer is the collector substation which is located approximately 600m away from the N12. The social specialists also identified Options 2 and 3 as being the least preferred, as a result of the heritage findings.

In terms of Powerline Option 2, it is noted that there are already powerlines and wind farms located in this area. The majority of powerline Option 2 runs adjacent to existing 400kV power lines and as such this section of the route alignment has already undergone a degree of transformation from its natural state. This would lessen the impacts of the new power line in this area. Furthermore, the visibility analysis undertaken by the visual specialist identified only a small portion of which most sections of the powerline would be visible to motorists travelling on the N12.

Based on the information presented above, the **applicant has selected powerline Option 2 to be authorised** (should EA be granted). The preferred alternatives, including maps, is further presented in the **Figure** below as well as in **Appendix 3.** The selected preferred substation site alternative and power line route alternative has been based on both environmental constraints and design factors.



PUBLIC PARTICIPATION PROCESS UNDERTAKEN

The Public Participation Process has been undertaken in line with Chapter 6 of the EIA Regulations 2014 (as amended 2017).

I&AP's and key stakeholders will be notified via email of the availability of the report. Site notices in English and Afrikaans (as per regulations) were placed along the entrance road to the application site and around the site itself on **2 July 2021**. Media Adverts were placed in a local newspaper (namely Die Courier) and a provincial newspaper (The Mercury) on the **19th of November 2021.** Additional media adverts will be placed on the **29th of April 2022**.

Copies of the Draft Basic Assessment Report will be located and available for review at the following locations:

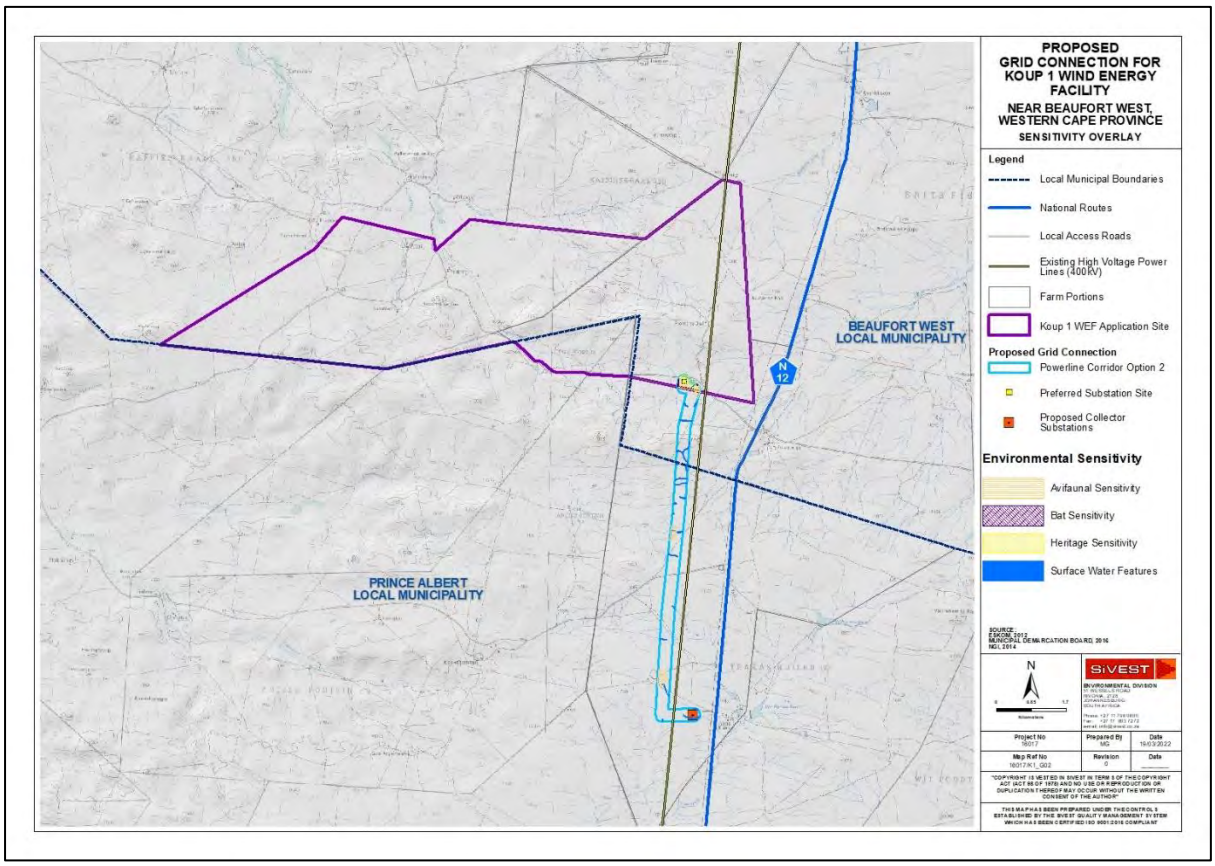
- SiVEST Website;
- Beaufort West Library, 15 Church Street, Beaufort West, Western Cape, South Africa; and
- Price Albert Public Library, 27 Church Street, Prince Albert, Western Cape.

Interested and affected persons (I&AP's) will be afforded a thirty (30) day comment period from the date of availability of the Draft BA Report (DBAR) to provide comment on the DBAR. An I&AP register will be opened and will be attached to this report. A summary of the issues raised during the public participation process will be documented in the Comments and Responses Report. This report will be updated following the comment period and attached to the Final BAR (FBAR).

ENVIRONMENTAL IMPACT STATEMENT:

The specialist assessments were conducted to address the potential impacts relating to the proposed development in order to ascertain the level of each identified impact, as well as mitigation measures which may be required. The results of the specialist assessments have indicated that all alternatives (including the preferred alternative) contain no fatal flaws that should prevent the proposed project from proceeding. In light of this, it is the EAP's reasoned opinion that authorisation be granted and that the layout being proposed as part of this BA process also be authorised (provided there are no concerns raised during the public participation process).

A layout of the development and the environmental sensitivities is included below:



The following specialist studies have been undertaken for the project:

- Visual Impact Assessment
- Transportation Impact Assessment
- Heritage Impact Assessment
- Palaeontological Impact Assessment
- Archaeological Assessment
- Cultural Landscape Assessment
- Desktop Geotechnical Assessment
- Agriculture and Soils Impact Assessment (desktop)

- Social Impact Assessment (desktop)
- Surface Water Impact Assessment
- Biodiversity Impact Assessment
- Avifaunal Impact Assessment

All specialist studies are included in **Appendix 6**. The specialist assessments concluded the following:

The **visual** specialist confirmed that that the potential visual impacts associated with the proposed Koup 1 WEF and associated grid infrastructure development are negative and of moderate significance. Given the low level of human habitation and the absence of sensitive receptors however, the project is **deemed acceptable from a visual perspective** and the EA should be granted. SiVEST is of the opinion that the impacts associated with the construction, operation and decommissioning phases can be mitigated to acceptable levels provided the recommended mitigation measures are implemented.

The **transportation** specialist confirmed that Koup 1 Wind Energy Facility and associated infrastructure will have a nominal impact on the existing traffic network. The project is therefore **deemed acceptable from a transport perspective**, provided the recommendations and mitigations measures in the traffic report are implemented, and hence the Environmental Authorisation (EA) should be granted for the EIA application.

In terms of **palaeontological** heritage resources, the specialist confirmed that the proposed Koup 1 grid connection developments are assigned a medium impact following mitigation. No significant further impacts on fossil heritage resources are anticipated in the planning, operational and decommissioning phases. The No-Go Option might have a negative low impact significance. The proposed grid connection development is not fatally flawed and, on condition that the recommended mitigation measures are included within the EMPr and implemented in full, there are no objections on palaeontological heritage grounds to their authorization.

The **archeologist** confirmed that the overall impact of the Koup 1 WEF and Grid, on the heritage resources, is seen as acceptably low after the recommendations have been implemented and therefore, impacts can be mitigated to acceptable levels allowing for the development to be authorized.

The **cultural specialist** recommended that the collector substation for proposed Gridline Option 2 requires relocation out of the N12 scenic road buffer and the CBA. With these buffers in place and all other recommendations followed, the overall impact to the cultural landscape for the proposed Koup 1 WEF and associated grid connection and infrastructure can be reduced from very high to moderate. There are no fatal flaws and the development can proceed with CLA recommendations and mitigation in place.

The **geotechnical specialist** confirmed that **no fatal flaws**, from a geotechnical perspective, were identified during this desktop study. The impact was found to be a negative low impact. The anticipated impact will have negligible negative effects and will require little to no mitigation. The site from a desktop level geotechnical study is considered suitable for the proposed development.

The **agricultural specialist** concluded that the proposed development will not have an unacceptable negative impact on the agricultural production capability of the site and the proposed development was identified as acceptable. From an agricultural impact point of view, it is recommended that the development be approved.

The **social specialist** that the positive social impacts associated with the project outweigh the negative, with a significant social benefit at a national level, the project is supported on a social basis.

The **surface water** specialist confirmed that, based on the findings of this study, there is no reason to withhold an authorisation of any of the proposed activities, assuming that key mitigations measures are implemented. No preference is provided with regard the grid connections, as it assumed based on the characteristics of the site, that all the aquatic systems could be spanned, while making use of existing tracks, however technical considerations have resulted in Option 2 being selected. Therefore, based on the refinement of the Substation / Laydown positioning not direct impacts on the aquatic environment are anticipated.

The **biodiversity specialist** confirmed that there are no impacts associated with the Koup 1 Grid Connection Option 2 and associated infrastructure that cannot be mitigated to an acceptable level. With the application of relatively simple mitigation and avoidance measures, the impact of the Koup 1 Grid Connection on the local environment can be reduced to a low and acceptable magnitude. The contribution of the Koup 1 Grid Connection development to cumulative impact in the area would be low and is considered acceptable. Overall, there are no specific long-term impacts likely to be associated with the development of the Koup 1 grid connection hat cannot be reduced to a low significance. As such, there are no fatal flaws associated with the development and no terrestrial ecological considerations that should prevent it from proceeding.

The **avifaunal specialist** confirmed that the proposed Koup 1 WEF grid connection will have a moderate impact on avifauna which, in most instances, could be reduced to a low impact through appropriate mitigation. **None of the proposed corridor options are fatally flawed**. The development is therefore supported, provided the mitigation measures listed in this report are strictly implemented.

The main findings of the specialist studies are included in **Section 17**.

A summary of the positive and negative impacts associated with the proposed project is included in **Section 16.**

It is trusted that the DBAR provides adequate information to the I&APs / stakeholders to provide input and for the competent authority to make an informed decision regarding the proposed development.

It should be noted that this section is deemed to be in line with the requirements of Appendix 1 of the EIA Regulations 2014, as amended, and contains a summary of the key findings of the environmental impact assessment, 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 (**Figure 38 and 36**) and a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.

WAY FORWARD

The Draft Basic Assessment Report is currently being circulated for public participation for a period of 30 days (excluding public holidays) from **29 April 2022** until **30 May 2022.**

All comments received will be responded to in a C&RR, which will be included prior to submission of the Final Basic Assessment Report (FBAR) to the decision-making authority, namely the DFFE. Comments received on the report will be taken into consideration, incorporated into the report (where applicable) and will be used when compiling the FBAR.

Once the FBAR has been submitted and the DFFE have acknowledged receipt thereof, a decision to either grant or refuse the EA for the proposed development will be made by the DFFE. In addition, once a decision regarding the EA has been received from the DFFE, it will be made available to the public and all registered I&APs, stakeholders and OoS / authorities will be notified accordingly and provided details regarding the appeal process. The BA process will thus come to an end once appeals (if any) have been dealt with adequately and the appeal process closes.

All I&APs and key stakeholders are invited to register as I&APs in order to be kept informed throughout the process. To register as an I&AP / stakeholder and/or to obtain additional information, please submit your name, contact details (telephone number, postal address and email address) and the interest which you have in the application to SiVEST Environmental Division, as per the details below:

Contact: Hlengiwe Ntuli
PO Box 2921, RIVONIA, 2128
☎ Phone: (011) 798 0600
E-mail: sivest_ppp@sivest.co.za
Fax: (011) 803 7272
Website: www.sivest.com

Please reference '*Koup 1 Grid'* in your correspondence, should your comments be project specific. SiVEST shall keep all registered I&APs / key stakeholders informed of the BA process.

GENESIS ENERTRAG KOUP 1 WIND FARM (PTY) LTD

KOUP 1 GRID INFRASTRUCTURE

DRAFT BASIC ASSESSMENT REPORT

TABLE OF CONTENTS

APPENDICES

Appendix 1: CV's of EAP's involved in the process and EAP declaration
Appendix 2: Maps
Appendix 3: Site Development/Route Alignment Plan
Appendix 4: Photographs
Appendix 5: Proof of public participation
Appendix 6: Specialist studies and declarations
Appendix 7: SiVEST Impact Rating System
Appendix 8: EMPr
Appendix 9: Other

LIST OF FIGURES

LIST OF TABLES

GENESIS ENERTRAG KOUP 1 WIND FARM (PTY) LTD

KOUP 1 GRID INFRASTUCTURE

DRAFT BASIC ASSESSMENT REPORT

1. INTRODUCTION

Genesis Enertrag Koup 1 Wind Farm (Pty) Ltd (hereafter referred to as 'Genesis') is proposing to develop one (1) new 33/132kV on-site substation and/or collector substation as well as one (1) new associated 132kV overhead power line for the proposed Koup 1 Wind Energy Facility (WEF) (part of a separate EIA process / application: **DFFE Reference Number: 14/12/16/3/3/2/2120**), near the town of Beaufort West in the Western Cape Province of South Africa (hereafter referred to as the 'proposed development') (**Figure 1**). The overall objective of the proposed development is to feed the electricity generated by the proposed Koup 1 WEF into the national grid. The grid connection and 33/132kV on-site substation and/or collector substation (this application) requires a separate Environmental Authorisation (EA), in order to allow the EA as well as the proposed infrastructure to be handed over to Eskom.

SiVEST Environmental Division has subsequently been appointed as the independent Environmental Assessment Practitioner (EAP) to undertake the Environmental processes for the proposed construction of the Koup 1 On-site Switching / Collector Substation and associated 132kV Power Line. The proposed development requires an EA from the National Department Forestry, Fisheries and the Environment (DFFE). However, the provincial authority (i.e. the Western Cape Department of Environmental Affairs and Development Planning - WC DEADP) as well as CapeNature will also be consulted. The EIA for the proposed development will be conducted in terms of the EIA Regulations, 2014 (as amended) promulgated in terms of Chapter 5 of the NEMA. In terms of these regulations, the proposed overhead power line and 33/132kV on-site switching substation / collector substation would be subject to a BA process in terms of the NEMA) (as amended) and Appendix 1 of the EIA Regulations, 2014 (as amended). All relevant legislation and guidelines will be consulted during the BA process and will be complied with at all times.

This report forms part of one (1) of two (2) grid connection infrastructure developments (namely on-site and/or collector substations and overhead power lines) that are being proposed on nearby properties by Genesis. In addition, two (2) WEF developments are also being proposed on adjacent properties by Genesis. The other proposed developments (i.e. WEF, substation and power line) which are being proposed on nearby properties by Genesis include the following:

- Koup 1 WEF – **DFFE Reference Number:** 14/12/16/3/3/2/2120 (part of a separate EIA process / application);
- Koup 2 WEF – **DFFE Reference Number:** 14/12/16/3/3/2/2121 (part of a separate EIA process / application); and
- Koup 2 Substation and Power Line – **DFFE Reference Number:** To be Allocated (part of separate BA process / application).

The grid connection infrastructure which is part of this application is being proposed to feed the electricity generated by the Koup 1 WEF into the national grid. It should be noted that the proposed grid connection infrastructure will be handed over to Eskom once constructed. The on-site and/or collector substation will include an Eskom portion and an Independent Power Producer (IPP) portion, hence the substation has been included in the WEF EIA (part of separate application) and in this associated grid connection infrastructure Basic Assessment (BA) (part of this application) to allow for handover to Eskom. Following construction, the substation will be owned and managed by Eskom. The current applicant will remain in control of the low voltage components (more specifically the 33kV yard) of the substation, while the high voltage components (i.e. 132kV components) of the substation will likely be ceded to Eskom shortly after the completion of construction.

Although the WEF (part of separate application) and associated grid connection infrastructure (part of this application) will be assessed separately, a single public participation process is being undertaken to consider all of the proposed developments [i.e. two (2) WEF EIAs and two (2) grid connection infrastructure BAs]. The potential environmental impacts associated with the proposed development have been assessed as part of the cumulative impact assessment.

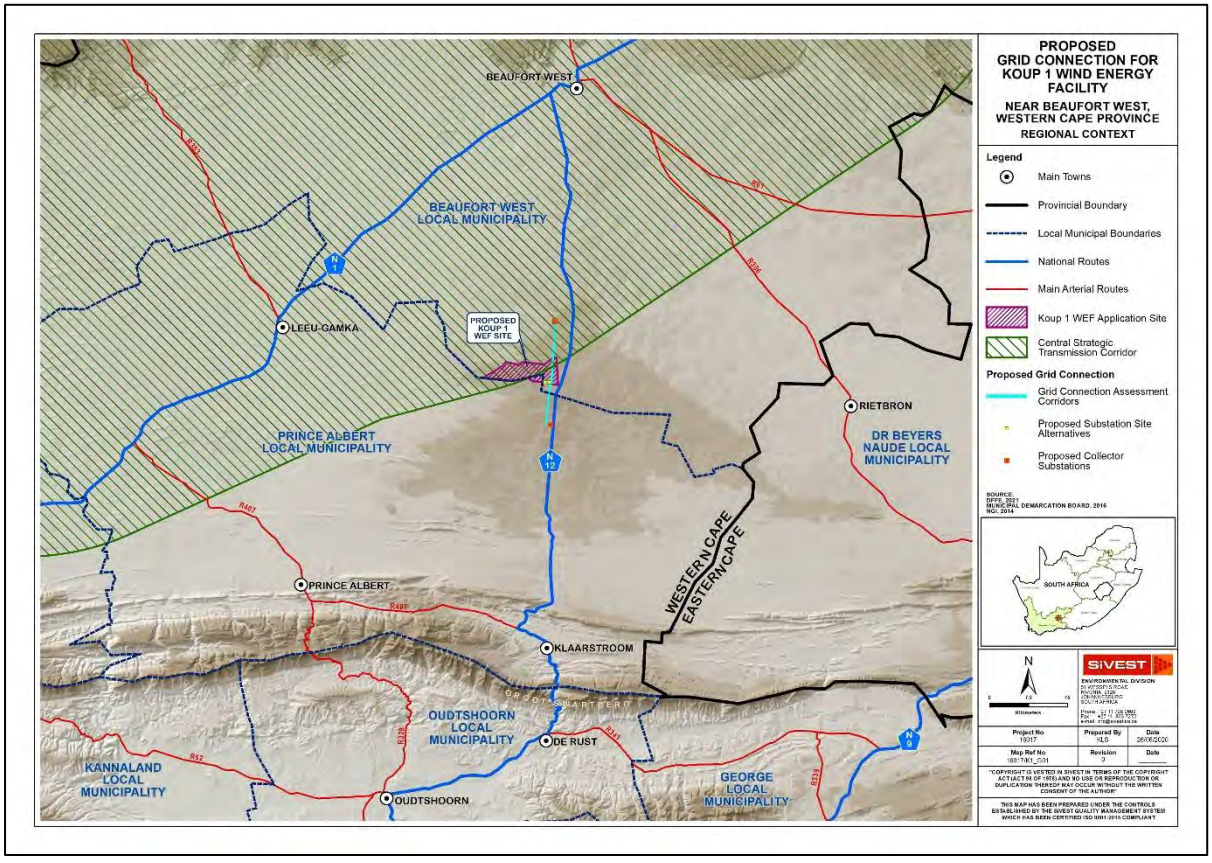


Figure 1: Koup 1 Regional Context

1.1 Content Requirements for a Basic Assessment Report

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 proper understanding of the process, informing all preferred alternatives, the scope of the assessment, an assessment of the significant impacts, findings of the specialists and proposed mitigation measures, and the consultation process followed through the BA process. The content requirements for a Basic Assessment Report (as provided in Appendix 1 of the EIA Regulations 2014, as amended), as well as details of which section of the report fulfils these requirements, are shown in **Table 1** below.

Table 1: Content requirements for a Basic Assessment Report

2014 EIA Regulations, as amended.	Requirements for Basic Assessment Reports	Location in this Basic Assessment Report
Appendix 1, Section 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—	Refer to relevant reference sections below:
Appendix 1, Section 3 (a)	Details of – (i) The EAP who prepared the report; and (ii) The expertise of the EAP, including a curriculum vitae.	Section 4
Appendix 1, Section 3 (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, coordinates of the boundary of the property or properties	Section 5
Appendix 1, Section 3 (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.	Section 5
Appendix 1, Section 3 (d)	A description of the scope of the proposed activity, including – (i) All listed and specified activities triggered and being applied for; and (ii) A description of the activities to be undertaken, including associated structures and infrastructure.	Section 7
Appendix 1, Section 3 (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;	Section 10 and 11
Appendix 1, Section 3 (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;	Section 13
Appendix 1, Section 3 (g)	a motivation for the preferred site, activity and technology alternative;	Section 14

2014 EIA Regulations, as amended.	Requirements for Basic Assessment Reports	Location in this Basic Assessment Report
Appendix 1, Section 3 (h)	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including-	Section 14
	(i) Details of all alternatives considered;	Section 14
	(ii) Details of the Public Participation Process undertaken in terms of Regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 14
	(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;	TBC in Final BAR
	(iv) The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 9 and 10
	(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 the impacts- (aa) Can be reversed; (bb) May cause irreplaceable loss of resources; and (cc) Can be avoided, managed, or mitigated.	Section 15
	(vi) The methodology used in deterring and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	Appendix 7
	(vii) Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographic, physical, biological, social, economic, heritage and cultural aspects;	Section 16
	(viii) The possible mitigation measures that could be applied and level of residual risk;	Section 15
	(ix) The outcome of the site selection matrix;	Section 14
	(x) If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and;	Not Applicable
	(xi) A concluding statement indicating the preferred alternatives, including preferred location of the activity.	Section 14
Appendix 1, Section 3 (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.	Appendix 7 and Section 15
Appendix 1, Section 3 (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.	Section 15

2014 EIA Regulations, as amended.	Requirements for Basic Assessment Reports	Location in this Basic Assessment Report
Appendix 1, Section 3 (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.	Section 17
Appendix 1, Section 3 (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.	Section 18
Appendix 1, Section 3 (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.	Refer attached in Appendix 8
Appendix 1, Section 3 (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.	Section 20
Appendix 1, Section 3 (o)	A description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 21
Appendix 1, Section 3 (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.	Section 18 and Section 22
Appendix 1, Section 3 (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.	Section 22
Appendix 1, Section 3 (r)	An undertaking under oath or affirmation by the EAP in relation to- (i) The correctness of the information provided in the report; (ii) The inclusion of the comments and inputs from stakeholders and interested and affected parties; (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.	Section 23
Appendix 1, Section 3 (s)	Where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts.	Not Applicable at this stage
Appendix 1, Section 3 (t)	any specific information required by the Competent Authority.	Section 24
Appendix 1, Section 3 (u)	Any other matter required in terms of section 24(4) (a) and (b) of the Act.	None
Appendix 1 Section 3 (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.	Noted and applied with

2. PROJECT TITLE

Proposed Development of the Koup 1 On-site Switching / Collector Substation and associated 132kV Power Line near Beaufort West in the Western Cape Province

3. DETAILS OF APPLICANT

3.1 Name and contact details of the Applicant

Name and contact details of Applicant:

Table 2: Name and contact details of the applicant

Business Name of Applicant	Genesis Enertrag Koup 1 Wind Farm (Pty) Ltd
Physical Address	39 De Villiers Road, Kommetjie
Postal Address	PO Box 363, Newlands, Cape Town
Postal Code	7725
Telephone	083 460 3898
Fax	086 689 0583
Email	davin@genesis-eco.com

4. DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTTIONER AND SPECIALISTS

4.1 Name and contact details of the Environmental Consultant

The table below provides the name and contact details of the Environmental Consultants who prepared this report:

Table 3: Name and contact details of the Environmental Consultant who prepared the report

Business Name of EAP	SiVEST SA (PTY) Ltd
Physical Address	4 Pencarrow Crescent, La Lucia Ridge Office Estate
Postal Address	PO Box 1899, Umhlanga Rocks
Postal Code	4320
Telephone	031 581 1500
Fax	031 566 2371
Email	michelleg@sivest.co.za

4.2 Names and expertise of the Environmental Assessment Practitioner (EAP)

The table below provides the names of the EAP's who prepared this report:

Table 4: Names and details of the expertise of the EAP's involved in the preparation of this report

Name of representative of the EAP	Educational Qualifications	Professional Affiliations	Experience (years)
Michelle Nevette *(Cert.Sci.Nat.)*	MEnvMgt. (Environmental Management)	SACNASP Registration No. 120356 EAPASA Registration No. 2019/1560 IAIAsa	19
Michelle Guy *(Pr.Sci.Nat.)*	MSc Environmental Science	SACNASP Registration No. 126338 EAPASA Registration No. 2019/868	9

Name of representative of the EAP	Educational Qualifications	Professional Affiliations	Experience (years)
		IAIAsa	
Katherine Wiles (*Cert.Sci.Nat*)	BSc (Geography and Environmental Management)	SACNASP Registration No. 300205/15 IAIAsa	11

CV's of SiVEST personnel and EAP declaration are attached in **Appendix 1.**

4.3 Names and expertise of the specialists

Specialist studies have been conducted in terms of the Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(A) and (H) And 44 of the NEMA when applying for EA, as well as the EIA Regulations, 2014 (as amended). The table below provides the names of the specialists involved in the project:

Table 5: Names of specialists involved in the project

Company	Name of representative of the specialist	Specialist	Educational Qualifications	Experience (years)
SiVEST SA (Pty) Ltd	Kerry Schwartz	Visual Impact Assessment	BA (Geography) GTc GISc 1187	25
SiVEST SA (Pty) Ltd	Merchandt Le Maitre	Transportation Impact Assessment	N Dip: Civil Engineering B Tech: Civil Engineering Pr.Tech.Eng. (Reg. No. 2018300094)	16
PGS Heritage (Pty) Ltd	Wouter Fourie	Heritage Impact Assessment	Professional Archaeologist (ASPA) Accredited Professional Heritage Practitioner with the Association of Professional Heritage Practitioners (APHP)	22
	John Almond	Palaeontological Impact Assessment	PhD (Palaeontology) Palaeontological Society of South Africa, Associated of Professional Heritage (W Cape)	40
	Nikki Mann	Archaeological Assessment	Msc Archaeology Professional Archaeologist with the Associated of Southern African Professional Archaeologists (ASAPA)	7

Company	Name of representative of the specialist	Specialist	Educational Qualifications	Experience (years)
	Emmylou Bailey	Cultural Landscape Assessment	MA Archaeology and Heritage Management APHP, ASAPA	15
JG Afrika (Pty) Ltd	Khuthadzo Bulala	Desktop Geotechnical Assessment	BSc (Hons) (Geology)	5
Johann Lanz Consulting	Johann Lanz	Agriculture and Soils Impact Assessment (desktop)	M.Sc. (Environmental Geochemistry)	24
Dr. Neville Bews & Associates	Dr Neville Bews	Social Impact Assessment (desktop)	D Litt et Phil	20
EnviroSci (Pty) Ltd	Dr Brian Colloty	Surface Water Impact Assessment	Ph D (Botany – Estuaries & Mangroves) Pr. Sci. Nat. 400268/07	25
3Foxes Biodiversity Solutions	Simon Todd	Biodiversity Impact Assessment	MSc (Conservation Biology) Pr.Sci.Nat 400425/11	20
Chris Van Rooyen Consulting	Chris van Rooyen	Avifaunal Impact Assessment	BA LLB	22
	Albert Froneman	Avifaunal Impact Assessment	MSc (Conservation)	22

5. LOCATION OF THE ACTIVITY

The proposed development is located approximately 55 km south of the town of Beaufort West, within the Beaufort West and Prince Albert Local Municipalities, in the Central Karoo District Municipality of the Western Cape Province (**Figure 2**).

At this stage, it is proposed that a 132kV overhead power line will connect the Koup 1 WEF on-site switching substation / collector to the national grid either by way of an off-site collector substation, or via a direct tie-in to existing 400kV transmission lines that traverse the Koup 1 WEF project site.

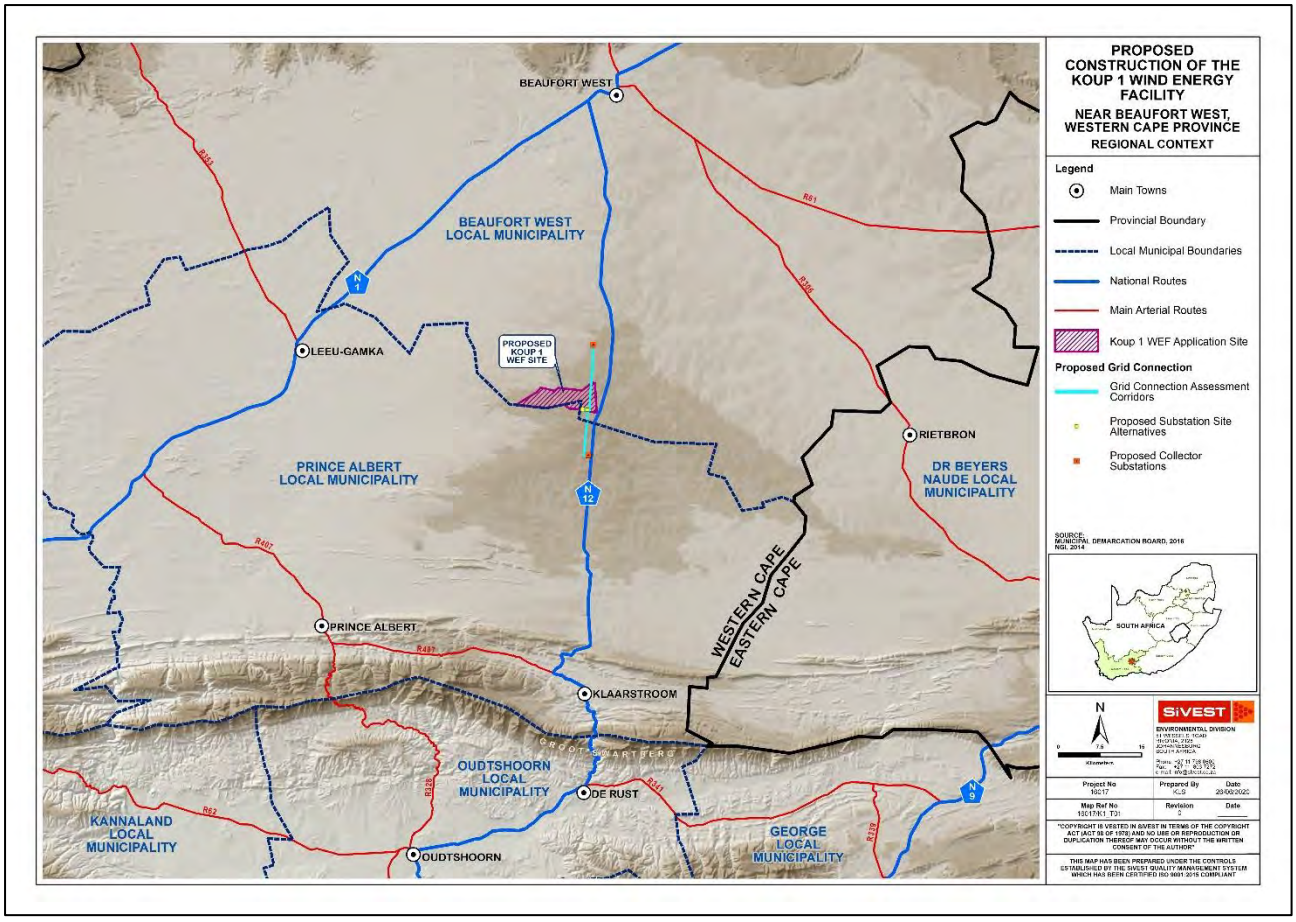


Figure 2: Site locality

5.1 21 Digit Surveyor General Codes of the site and Property Description

The following properties were considered for the various grid alternatives for Koup 1:

Table 6: Summary of affected properties (including SG Codes and Farm Names) for all alternatives

21 Digit Surveyor General Code	Description	Portion	Farm No.	Farm Name
C06100000000001500001	***PORTION 1 OF THE FARM TRAKAS KUILEN NO 15***	***1***	***15***	***TRAKAS KUILEN***
C00900000000037400011	***PORTION 19 OF THE FARM BRITS EIGENDOM NO 374***	***11***	***374***	***BRITS EIGENDOM***
C00900000000037400019	PORTION 19 OF THE FARM BRITS EIGENDOM NO 374	19	374	BRITS EIGENDOM
C00900000000037400024	***PORTION 24 OF THE FARM BRITS EIGENDOM NO 374***	***24***	***374***	***BRITS EIGENDOM***
C00900000000038000004	PORTION 4 OF FARM NO 380	4	380	FARM 380

Properties in bold represent properties affected by the preferred alternative.

5.2 Coordinates of the site

The coordinates for the grid connection and associated substations are as follows:

Table 7: Grid Connection Coordinates

KOUP 1 GRID CONNECTION COORDINATES				
CORRIDOR ALTERNATIVE	**START POINT**	**MIDDLE POINT**	**END POINT**	**APPROX LENGTH (KM)**
OPTION 1	S32° 52' 39.987"	S32° 52' 41.799"	S32° 52' 42.912"	1.30
	E22° 31' 29.090"	E22° 31' 56.153"	E22° 32' 22.456"	
OPTION 2	***S32° 52' 42.085"***	***S32° 54' 51.470"***	***S32° 57' 6.005"***	***9.90***
	E22° 32' 1.356"	***E22° 31' 55.475"***	***E22° 32' 15.187"***	
OPTION 3	S32° 52' 39.987"	S32° 49' 52.315"	S32° 46' 21.158"	12.90
	E22° 31' 29.090"	E22° 32' 27.243"	E22° 32' 38.592"	

Highlighted option represents the preferred alternative.

Table 8: On-site Substation Coordinates

KOUP 1 SUBSTATION COORDINATES AT CENTRE POINT		
SITE ALTERNATIVE	**SOUTH**	**EAST**
OPTION 1	***S32° 52' 42.085"***	***E22° 32' 1.356"***
OPTION 2	S32° 52' 39.987"	E22° 31' 29.090"

Highlighted option represents the preferred alternative.

Table 9: Collector Substation Coordinates

KOUP 1 COLLECTOR SUBSTATION COORDINATES AT CENTRE POINT		
SITE ALTERNATIVE	**SOUTH**	**EAST**
OPTION 1	S32°52'43.58"	E22°32'24.84"
OPTION 2	**S32° 57' 6.005"**	**E22° 32' 15.187"**
OPTION 3	S32°46'19.70"	E22°32'39.00"

Highlighted option represents the preferred alternative.

6. SITE LAYOUT/ ROUTE ALIGNMENT PLAN

The Site Layout/Route Alignment Plan is attached in **Appendix 3**.

Photographs of the site are included in **Appendix 4**.

7. ACTIVITY INFORMATION

7.1 Project Description

Electricity generated by the proposed Koup 1 WEF will be fed into the national grid by way of a 132kV overhead power line, connecting the Koup 1 WEF on-site switching substation / collector to an off-site collector substation, or by way of a direct tie-in to existing 400kV transmission lines that traverse the Koup 1 WEF project site. **Figure 3** below provides a conceptual diagram of the electricity generation process.

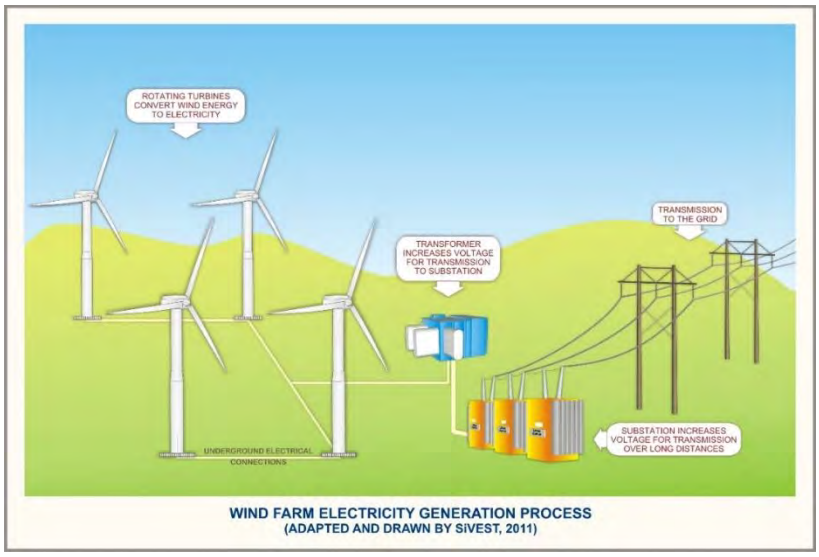


Figure 3: Conceptual WEF electricity generation process showing electrical connections

The proposed grid connection infrastructure to serve the Koup 1 WEF will include the following components:

- One (1) new 33/132kV on-site substation and/or collector substation, occupying an area of up to approximately 1.5 ha. The proposed substation will be a step-up substation and will include an Eskom portion and an IPP portion; and
- One (1) new 132kV overhead power line connecting the on-site and/or collector substation either to an off-site collector substation, or via a direct tie-in to the existing 400kV overhead power lines and thereby feeding the electricity into the national grid. Power line towers being considered for this development include self-supporting suspension monopole structures for relatively straight sections of the line and angle strain towers where the route alignment bends to a significant degree. Maximum tower height is expected to be approximately 25m.

The Preferred Route Alignment and substation placement is reflected below in **Figure 4** and attached in **Appendix 3**.

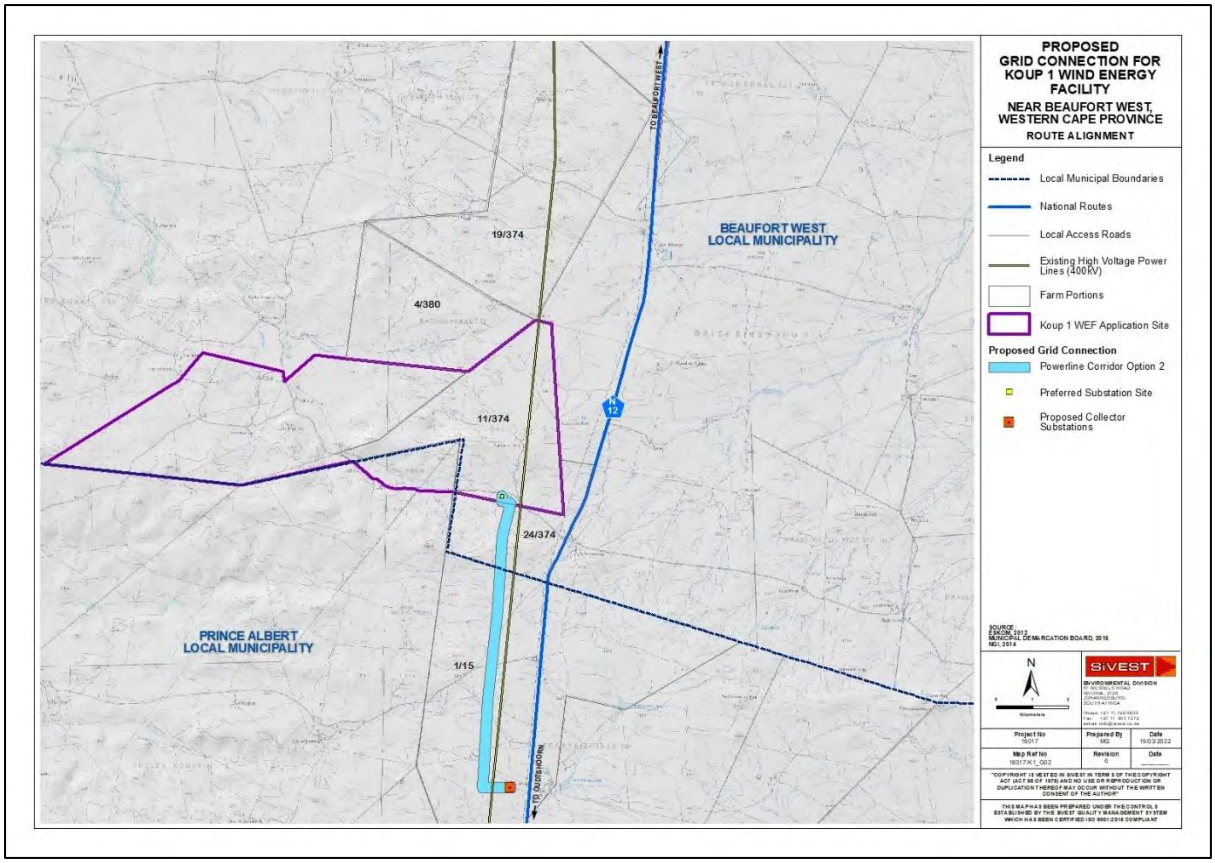


Figure 4: Preferred route alignment and substation locations

The project infrastructure has been placed strategically within the development area based on environmental constraints.

A summary of the project technical details is provided in **Table 10** below.

Table 10: Technical Detail Summary

Component	Description / Dimensions
Project Location	The proposed development is located approximately 55 km south of the town of Beaufort West, within the Beaufort West and Prince Albert Local Municipalities, in the Central Karoo District Municipality of the Western Cape Province
Generation Capacity of Substation	33/132kV
Affected Properties	• Portion 1 of the Farm Trakas Kuilen No. 15; • Portion 11 of the Farm Brits Eigendom No. 374; • Portion 24 of the farm Brits Eigendom No. 374.
SG Codes	• C06100000000001500001 • C09000000000037400011 • C09000000000037400024
Area occupied by Substation	Up to approximately 1.5 hectares.
Height of Substation	Height of substation will be confirmed during the final design stages of the substation, prior to construction commencing

Component	Description / Dimensions
Site Access	Access to the proposed development (substation application site) will be via an existing gravel road.
Construction laydown area	One (1) construction laydown / staging area of up to approximately 2.25ha. It should be noted that no construction camps will be required in order to house workers overnight as all workers will be accommodated in the nearby town.
Operation and Maintenance building	One (1) permanent Operation and Maintenance (O&M) building, including an on-site spares storage building, a workshop and an operations building to be located on the site identified for the construction laydown area.
Fencing	No new fencing is envisaged at this stage. Current fencing is standard farm fence approximately 1-1.5m in height. Fencing might be upgraded (if required) to be up to approximately 2m in height.
Grid Connection Information	▪ One (1) new 33/132kV on-site substation and/or collector substation, occupying an area of up to approximately 1.5 ha, and; ▪ One (1) new 132kV overhead power line connecting the on-site and/or collector substation either to an off-site collector substation, or via a direct tie-in to the existing 400kV overhead power lines and thereby feeding the electricity into the national grid. Power line towers being considered for this development include self-supporting suspension monopole structures for relatively straight sections of the line and angle strain towers where the route alignment bends to a significant degree. Maximum tower height is expected to be approximately 25m.

7.2 NEMA Listed Activities

The amended EIA Regulations promulgated under Section 24(5) of the National Environmental Management Act, Act 107 of 1998 and published in Government Notice No. R. 326 list activities which may not commence without environmental authorization from the Competent Authority. The proposed activity is identified in terms of Government Notice No. R. 327, and 324 for activities which must follow a Basic Assessment Process. The project will trigger the following listed activities:

Table 11: Listed activities in terms of NEMA: EIA Regulations 2014 (as amended in 2017), applicable to the proposed project

Activity No(s):	Relevant activities as set out in Listing Notices 1, 2 and 3 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
Relevant Basic Assessment Activities as set out in Listing Notice 1		
11 (i)	**GN R. 327 (as amended) Item 11:** The development of facilities or infrastructure for the transmission and distribution of electricity—	One (1) new on-site substation and/or collector substation will be constructed within the proposed application site as part of the proposed development. The proposed substation will be located outside urban areas and will have a capacity of 33/132kV (33kV yard subject to this BA / application). In

Activity No(s):	Relevant activities as set out in Listing Notices 1, 2 and 3 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
	(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.	addition, the substation will occupy a footprint of up to approximately 1 hectares (ha) (10 000m^2). The proposed development will also involve the construction of one (1) overhead power line which will be located outside an urban area. The proposed power line will have a capacity of 132kV. These proposed power line will be located outside an urban area.
12 (ii) (a) (c)	**GN R. 327 (as amended) Item 12:** The development of: ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs- (a) within a watercourse; (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.	Maintenance access tracks (that do not trigger Listing Notice 1 Activity) associated with the proposed Power lines will cross watercourses. The proposed development will entail the construction of an overhead power line. The power line will traverse some of the surface water features / watercourses identified and/or be located within 32m of some of the surface water features / watercourses identified.
19	**GN R. 327 (as amended) Item 19**: The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;	Although the layout of the proposed development has been designed to avoid the identified surface water features / watercourses as far as possible, parts of the proposed overhead power line will need to traverse some of the identified surface water features / watercourses. In addition, during construction of the overhead power line, soil will need to be removed from some of the identified surface water features / watercourses.
24 (ii)	**GN R. 327 (as amended) Item 24:** The development of a road - ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres.	Internal roads are required within the application site in order to provide access to the on-site and/or collector substation. Roads are also required in order to access the proposed overhead power line. Existing site roads will be used wherever possible, although new site roads will be constructed where necessary. As such, the proposed development will involve the construction of new internal roads within the application site as well as the properties traversed by the power line corridor route alternatives, as required. It is proposed that these new internal access roads will be between approximately 8m and 10m wide.
27 (i)	**GN R. 327 (as amended) Item 27:** The clearance of an area of 1 hectares or more,	The proposed development involves the construction of one (1) new on-site and/or

Activity No(s):	Relevant activities as set out in Listing Notices 1, 2 and 3 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
	but less than 20 hectares of indigenous vegetation.	collector substation which will occupy an area of approximately 1,5ha. All vegetation on the substation site will need to be cleared for construction. Cleared vegetation will amount to an area of up to approximately 1,5ha.
28 (ii)	**GN R. 327 (as amended) Item 28:** Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;	The proposed development site is currently zoned for agricultural land use, and the area to be developed will be larger than 1ha.
31 (i)	**GN R. 327 (as amended) Item 31:** The decommissioning of existing facilities, structures or infrastructure for - (i) any development and related operation activity or activities listed in this Notice, Listing Notice 2 of 2014 or Listing Notice 3 of 2014;	Should the proposed development's Power Purchase Agreement (PPA) not be renewed after 20 years (anticipated operational lifespan of proposed development), the proposed development would need to be decommissioned. This would include the decommissioning of the on-site and/or collector substation as well as the overhead power line connecting the substation to the national grid.
48 (i) (a) (c)	**GN R. 327 (as amended) Item 48:** The expansion of- (i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; where such expansion occurs— (a) within a watercourse; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;	The proposed project will most likely entail the expansion (upgrading) of roads and other infrastructure by 100m^2 or more within a surface water feature / watercourse or within 32 m from the edge of a surface water feature / watercourse.
56 (ii)	**GN R. 327 Item 56:** The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre - (ii) where no reserve exists, where the existing road is wider than 8 metres –	Internal roads are required within the application site in order to provide access to the on-site and/or collector substation. Roads are also required in order to access the proposed overhead power line. Existing internal roads may require widening by more than 6m, or by lengthening them by more than 1km.
Relevant Scoping and EIA Activities as set out in Listing Notice 2 of the EIA Regulations, 2014 as amended		
None		
Relevant Basic Assessment Activities as set out in Listing Notice 3 of the EIA Regulations, 2014 as amended		

Activity No(s):	Relevant activities as set out in Listing Notices 1, 2 and 3 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
4 i. (ii) (aa)	**GN R. 324 (as amended) Item 4:** The development of a road wider than 4 metres with a reserve less than 13,5 metres. **i. Western Cape** ii. Areas outside urban areas; (aa) Areas containing indigenous vegetation;	The proposed project is likely to require the development of roads wider than 4m with a reserve of less than 13.5m in areas containing indigenous vegetation. Internal access roads with a width of between approximately 8m and 10m wide will provide access to the substation and proposed overhead power line. These roads will occur within the Western Cape Province, outside urban areas.
12 i. ii.	**GN R. 324 (as amended) Item 12:** The clearance of an area of 300 square metres or more of indigenous vegetation **i. Western Cape** ii. Within critical biodiversity areas identified in bioregional plans;	The proposed development will transform more than 300m^2 of indigenous vegetation. Part of the power line corridor route alternative 3 traverses a Critical Biodiversity Area (CBA) 1 area in the north-eastern corner of the Koup 1 WEF application site. Clearance will thus occur within a CBA.
14 (ii) (a) (c); i. i. (ff)	**GN R. 985 (as amended) Item 14:** The development of – (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs – (a) within a watercourse; (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; **i. Western Cape** i. Outside urban areas: (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or inbioregional plans;	The proposed development will entail the construction of an on-site and/or collector substation as well as associated overhead power line and roads with a physical footprint of 10m^2 or more. The proposed substation will occupy an area of up to approximately 1.5ha. The proposed substation will avoid the surface water features / watercourses identified within the application site where possible, although the power line and/or internal and access roads will traverse some of the surface water features / watercourses identified and/or be located within 32m of some of the surface water features / watercourses identified. The proposed development will be located outside an urban area. In addition, part of the power line corridor route alternatives traverse a Critical Biodiversity Area (CBA)/Ecological Support Area (ESA).
18 i. ii. (aa)	**GN R. 324 (as amended) Item 18:** The widening of a road by more than 4 meters, or the lengthening of a road by more than 1 kilometer- **i. Western Cape** ii. All areas outside urban areas: (aa) Areas containing indigenous vegetation	Internal roads are required within the application site in order to provide access to the on-site and/or collector substation. Roads are also required in order to access the proposed overhead power line. Existing site roads will be used wherever possible, although new site roads will be constructed where necessary. Existing internal roads will thus need to be upgraded as part of the proposed development (where required). Internal roads will be widened by more than 4m or

Activity No(s):	Relevant activities as set out in Listing Notices 1, 2 and 3 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
		lengthened by more than 1km. These roads located within the application site will occur within the Western Cape Province, outside urban areas. In addition, the properties affected by the proposed development contain indigenous vegetation.
23 (ii) (a) (c); i. i. (ff)	**GN R. 324 (as amended) Item 23:** The expansion of – (ii) infrastructure or structures where the physical footprint is expanded by 10 square metres or more; where such expansion occurs – (a) within a watercourse; (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; **i. Western Cape** i. Outside urban areas: (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;	The proposed development will entail the development and expansion of roads by 10m^2 or more within a watercourses or within 32m from the edge of a watercourses. The proposed development will be located outside an urban area. In addition, part of the power line corridor route alternatives traverse a Critical Biodiversity Area (CBA)/Ecological Support Area (ESA).

8. NATIONAL WEB-BASED ENVIRONMENTAL SCREENING TOOL

The National Web based Environmental Screening Tool is a geographically based web-enabled application which allows a proponent intending to submit an application for environmental authorisation in terms of the Environmental Impact Assessment (EIA) Regulations 2014, as amended to screen their proposed site for any environmental sensitivity.

According to the DFFE Screening Tool Report (attached in **Appendix 9**), the following themes described in **Table 10** below are applicable to the proposed grid and substation development:

Table 12: DEA Screening tool themes

Theme	Sensitivity		Comment
	Grid	Substation	
Agriculture Theme	Medium	Medium	The Agricultural Compliance Statement is included in **Appendix 6** of the Draft Basic Assessment Report. The medium agricultural sensitivity, as identified by the screening tool, is disputed by the specialist. The motivation for disputing the sensitivity is that the climate data (very low rainfall of approximately 155 mm per annum and high evaporation of

Theme	Sensitivity		Comment
	Grid	Substation	
			approximately 1,400 mm per annum) proves the area to be too arid for viable rain fed cultivation, and a medium sensitivity is not therefore justified. In addition, the land type data shows the soils to be dominated by shallow soils on underlying rock, which are also totally unsuitable for cultivation.
Animal Species Theme	High	Medium	The Terrestrial Ecological Report is included in **Appendix 6** of the Draft Basic Assessment Report. Parts of the site are mapped as High sensitivity due to the presence of various avifauna. The results of the site verification indicate that the site can be considered low sensitivity for both the Padloper and Riverine Rabbit. The riparian habitat at the site is sparse and rocky and is not considered suitable for the Riverine Rabbit. The low sensitivity of the site for the Riverine Rabbit was also confirmed through communication with the EWT Drylands Programme which confirmed that there are no records from the Koup area. In terms of the Padloper, this species would occur on the rocky hills of the site, but despite extensive searching for this species, it was not found within the site. As the vegetation cover and extent of rocky crevices where this species could shelter are limited, the site is considered low sensitivity for the Karoo Padloper.
Aquatic Biodiversity Theme	Very High	Low	The Terrestrial Ecological Report is included in **Appendix 6** of the Draft Basic Assessment Report. The specialist has confirmed that the site contains areas of very high sensitivity due to the presence of CBAs, NFEPAs and rivers. According to the specialist, the remaining area within the development footprint is deemed to be of low sensitivity.
Archaeological and Cultural Heritage Theme	Low	Low	The Heritage Reports are included in **Appendix 6** of the Draft Basic Assessment Report.

Theme	Sensitivity		Comment
	Grid	Substation	
			In terms of archaeological findings, according to the specialist, the low rating as provided by the Environmental Screening Tool possibly reflects scarcity of heritage reports conducted in the region. In terms of the cultural landscape, the area would be classified as very high sensitivity based on a desktop assessment and a four-day site visit. Applying the precautionary, an overall Very High Cultural Landscape sensitivity is inferred for the grid connection area.
Civil Aviation (Wind) Theme	High	High	The closest airport is the Oudtshoorn Airport, located approximately 144 km from the site.
Defence (Wind) Theme	Low	Low	The entire site has a low sensitivity in terms of the defence theme. No further specialist study required.
Palaeontology Theme	Very High	Very High	The Heritage Report is included in **Appendix 6** of the Draft Basic Assessment Report. The palaeontological heritage site sensitivity of the combined Koup 1 WEF and associated grid connection project areas has been verified on the basis of desktop studies as well as a 5-day site visit. Applying the Precautionary Principle, an overall High Palaeontological Sensitivity is inferred for the WEF and grid connection project areas.
Plant Species Theme	Medium	Medium	The Terrestrial Ecological Report is included **Appendix 6** of the Draft Basic Assessment Report. Due the failure to detect any plant species of conservation concern at the site, the site is considered low sensitivity for flora.
Terrestrial Biodiversity Theme	Very High	Low	The Terrestrial Ecological Report is included **Appendix 6** of the Draft Basic Assessment Report. The overall combined Terrestrial Biodiversity theme for Koup site indicates that the site consists largely of low sensitivity areas with occasional areas of Very High sensitivity associated with the

Theme	Sensitivity		Comment
	Grid	Substation	
			CBAs, NFEPA Catchments and drainage features of the site. While the conservation planning features of the site are difficult to confirm or dispute based on the site verification, the development entirely avoids this area, with the result that the Very High sensitivity status of that part of the site does not need to be confirmed or disputed. As such, the study takes a conservative approach and does not dispute the Very High sensitivity of this area, and confirms the general low sensitivity of the rest of the site. The development does not encroach near to the very high sensitivity area and would not directly impact on this area in any way.

9. DESCRIPTION OF THE RECEIVING ENVIRONMENT

This chapter summarises the environmental attributes associated with the proposed project study area focusing on the geographical, physical and biological environment.

9.1 Geographical

The proposed Koup 1 WEF and associated grid connection infrastructure is located approximately 55km south of Beaufort West in the Western Cape Province and is within the Beaufort West and Prince Albert Local Municipalities, in the Central Karoo District Municipality. The regional context of the proposed application area is shown in **Figure 5** below.

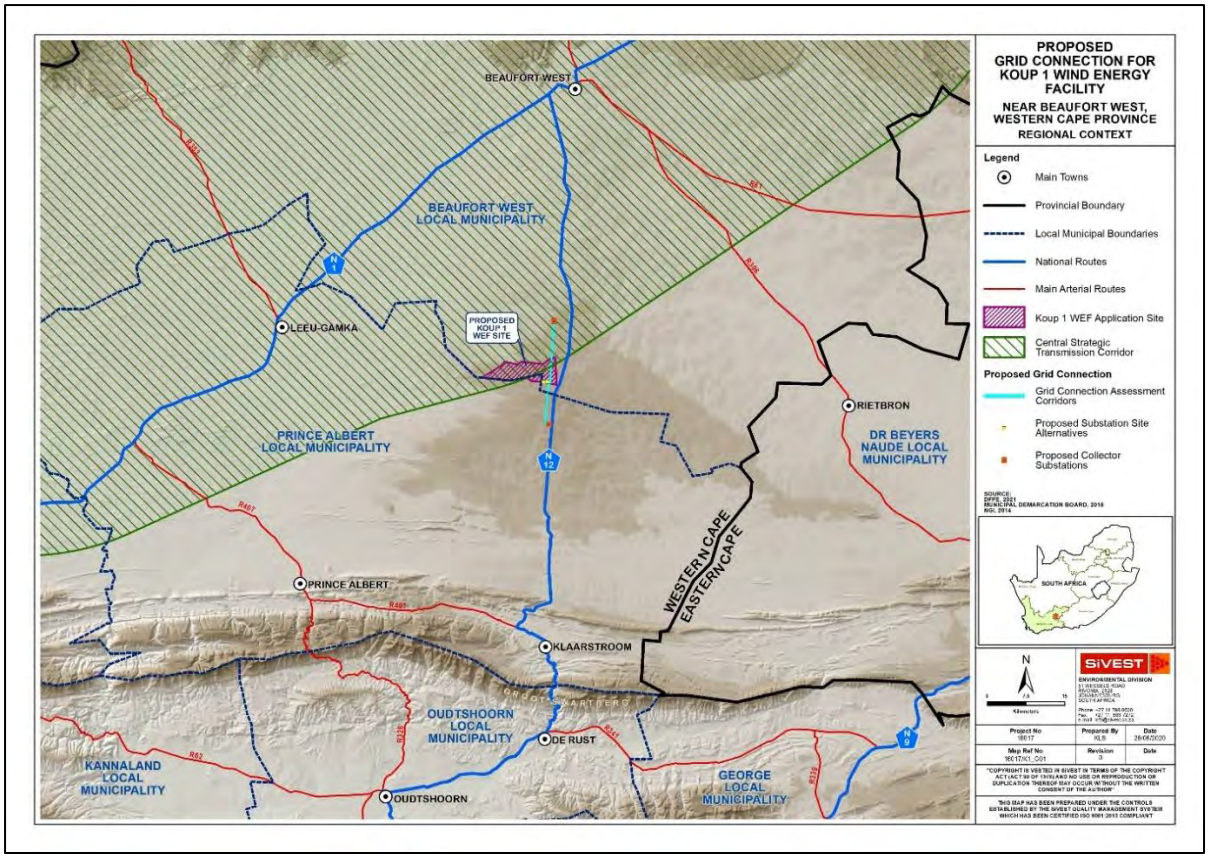


Figure 5: Regional Context

9.2 Land Use

According to the South African National Land Cover dataset (Geoterraimage 2018), much of the assessment area is classified as “Bare / Barren Land”, interspersed with patches of low shrubland. While some of these bare / barren areas are representative of transformation due to human activity, in most cases these patches of land are merely undisturbed areas with very sparse vegetation cover. Small tracts of grassland and forested land occur along drainage lines throughout the study area (**Figure *6***).

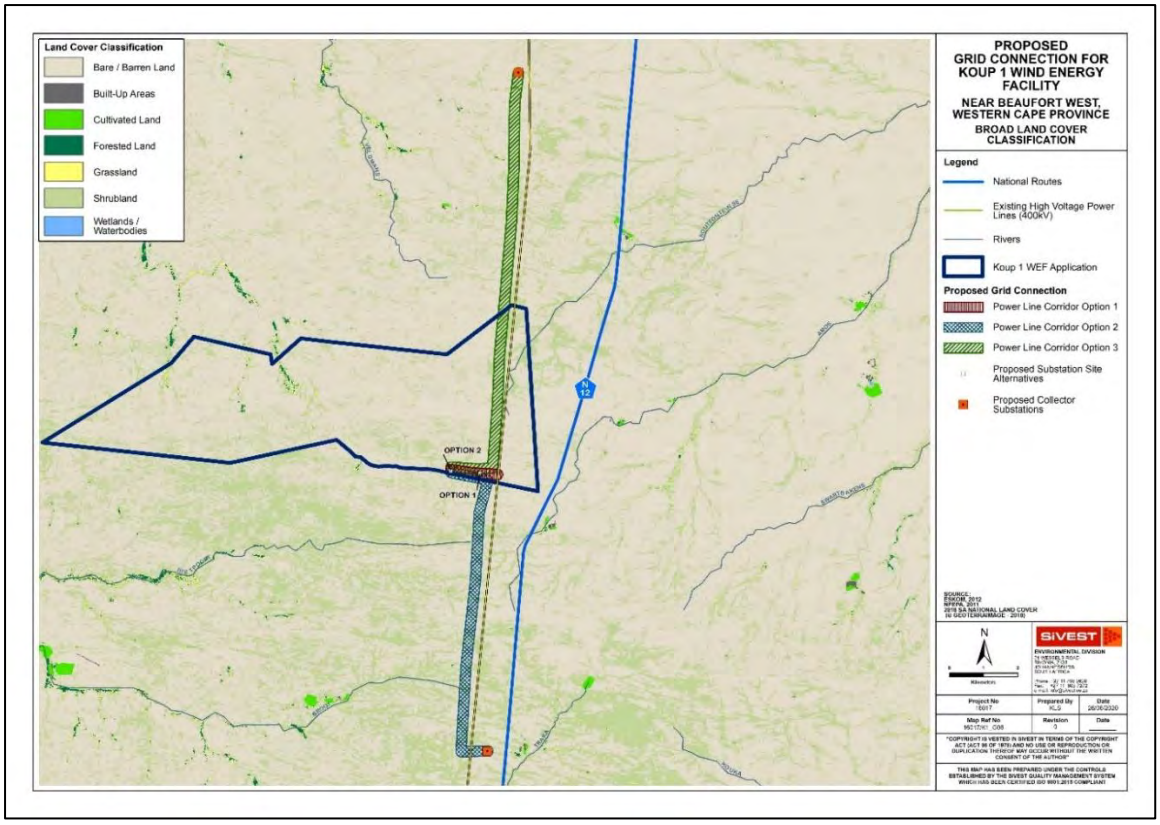


Figure 6: Land Cover Classification

Agricultural activity in the area is restricted by the arid nature of the local climate and areas of cultivation are largely confined to relatively limited areas distributed along drainage lines. As such, the natural vegetation has been retained across much of the study area. Livestock (mostly sheep) and game farming (**Figure 7**) is the dominant activity although the climatic and soil conditions have resulted in low densities of livestock and relatively large farm properties across the area. Thus the area has a very low density of rural settlement, with relatively few isolated farmsteads in evidence (**Figure 8**). Built form in much of the study area is limited to isolated farmsteads, including farm worker's dwellings and ancillary farm buildings, gravel access roads, telephone lines, fences and windmills (**Figure 9**).

Figure 7: Game farm just south of the Koup 1 WEF

Figure 8: Isolated farmsteads typical of the Koup 1 WEF study area

Figure 9: Farm buildings and associated infrastructure south-west of the Koup 1 WEF application site.

Further human influence is visible in the area in the form of the N12 national route which traverses the study area in a north to south direction (**Figure 10**). In addition, existing, power lines, both 22kV (**Figure 11**) and 400kV power lines (**Figure 12**) in this area are also significant man-made features in an otherwise undeveloped landscape. These lines bisect the study area in a north to south alignment, relatively close to the N12.

Figure 10: View southwards along the N12 National Route on the eastern boundary of Koup 1 WEF application site.

Figure 11: 22kV power lines and associated substation south of the Koup 1 WEF application site, adjacent to the N12.

Figure 12: View of 400kV power lines to the east of the Koup 1 WEF application site.

The closest built-up area is the town of Beaufort West which is situated approximately 55km north of the Koup 1 application site. The town is well outside the study area for this project and is thus not expected to have an impact on the visual character of the study area.

9.3 Climate

The study area is characterized by a hot semi-arid climate with a “BSk” classification according to the Köppen-Geiger climate classification. Beaufort West receives a relatively low mean annual precipitation of 392 mm. The average lowest rainfall is received in June (15 mm) and the highest in March (57 mm), which is a seasonal variation of 42 mm. The maximum midday temperatures for Beaufort West ranges from 31.7°C in January to 18°C in July. The minimum temperatures for Beaufort West ranges from 16.6°C in February to 4.4°C in July. The average temperatures vary during the year by 12.9°C.

9.4 Topography

The site proposed for the grid connection infrastructure is located in an area largely characterised by flat to gently undulating plains interspersed with low ridges and dry river courses. Areas of greater relief are largely concentrated to the south east of the study area. According the slope gradient map prepared by JG Afrika (July 2021) as part of the Geotechnical Report (**Figure 13**), the site is characterised by flat to gentle terrain (0.40˚ – 8.7˚ slopes). Spot heights indicate elevation values in the range of 901m to 1060m above mean sea level. Flat to undulating terrain prevails across much of the development site, although steep slopes associated with a low ridge in the south-eastern sector of the site result in some areas of greater relief.

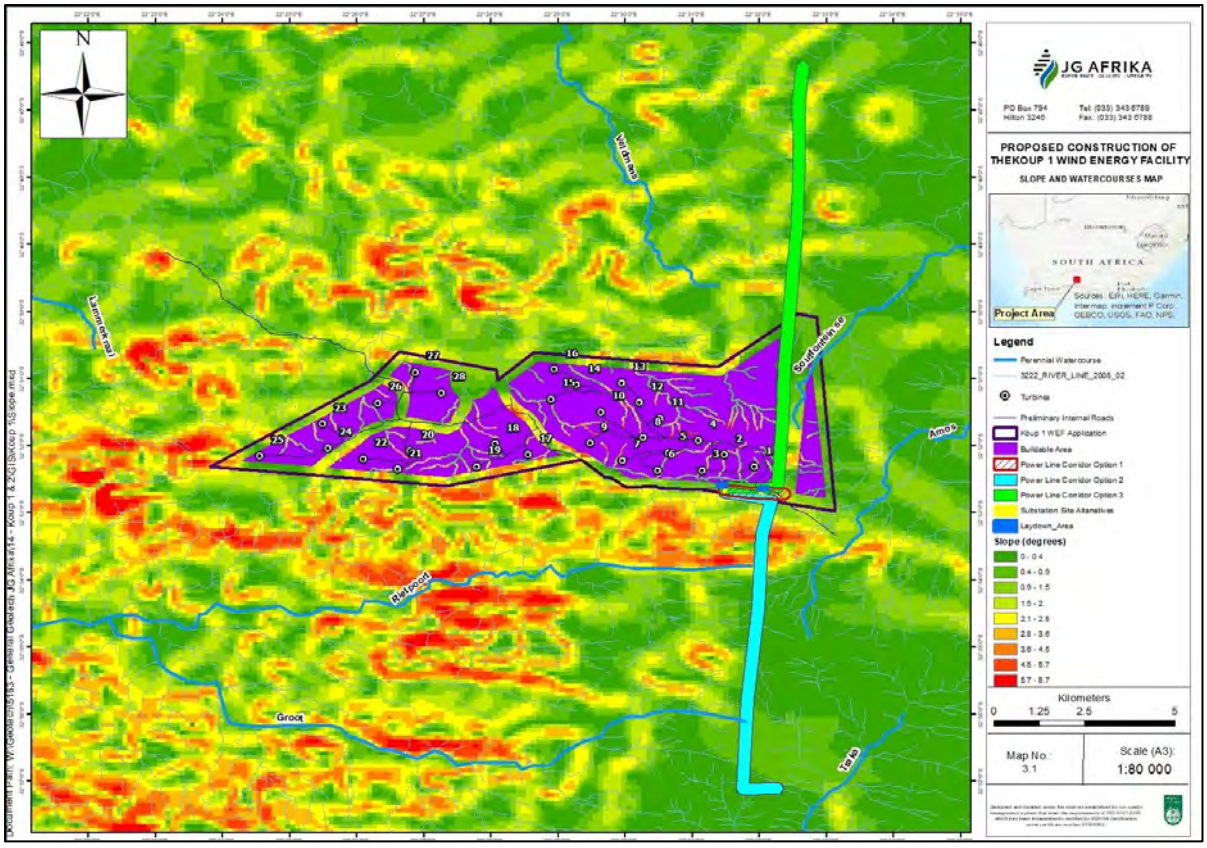


Figure 13: Topography

9.5 Geology and Soils

A desktop geotechnical report was undertaken by JG Afrika (Pty) Ltd (July 2021). According to the report, *the study area is underlain by rock units of the Teekloof Formation (Pt), which is underlain by rock units of the Abrahamskraal (Pa) Formation* (**Figure 14**). *These rock units form part of the Adelaide Subgroup of the Beaufort Group, of the greater Karoo Supergroup.*

The Abrahamskraal Formation (Pa) is represented by grey and green mudstone, siltstone and subordinate sandstone. Thin chert beds are common on the lowermost red mudstones of the Abrahamskraal Formation. These rock units are overlain by the Teekloof Formation (Pt) which is represented by mudstone, siltstone and fine to very fine grained wackes and arenites. Quaternary alluvial deposits overlie the geological formations over localised areas in the east and south east of the site.

Substation option 1 is underlain by the Teekloof Formation. Substation Option 2 is underlain by the quaternary deposits which are underlain by the Teekloof Formation. Both options lie on a flat slope with slope of 0.9-2˚ for option 1 and 1.5- 2˚ for option 2. Shallow foundations are anticipated at both sites.

Power Line Corridor Option 1 is underlain by the Teekloof Formation. In the western section, the Teekloof Formation is overlain by quaternary alluvial deposits. The majority (southern and central sections) of Power Line Corridor Option 2 is underlain by the Abrahamskraal Formation. The northern section is underlain by the quaternary deposits which are underlain by the Teekloof Formation. Power

Corridor Option 3 is underlain by Abrahamskraal and Teekloof Formations. The Teekloof Formation is overlain by Quaternary alluvial deposits in parts of the southern section.

Both Collector Substation Alternatives are underlain by the Abrahamskraal Formation. Both alternatives lie on a flat slope of 0-0.4˚.

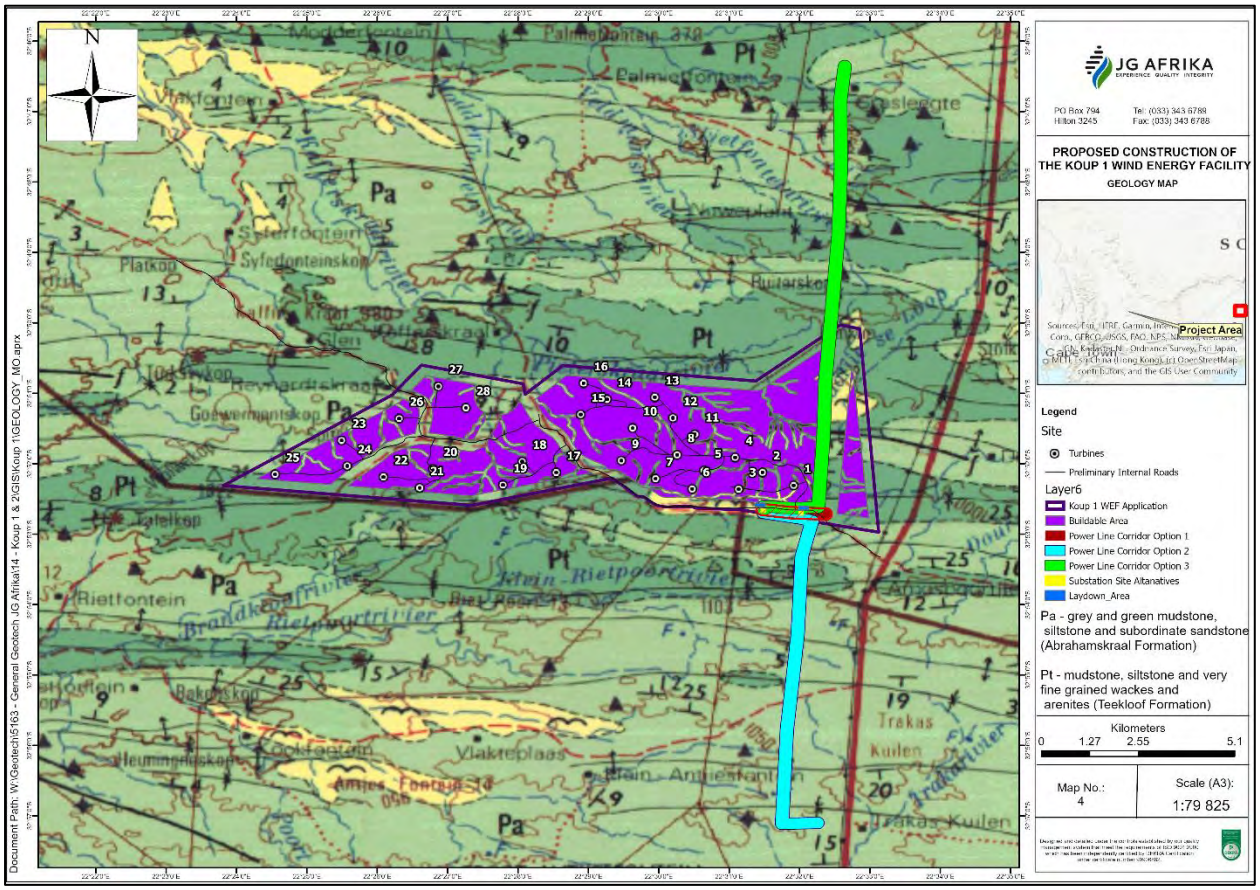


Figure 14: Geology

9.6 Geohydrology

According to the desktop geotechnical report undertaken by JG Afrika (Pty) Ltd (July 2021), *the study area lies within the L12C catchment area which receives a mean annual precipitation of 152mm.*

According to the 1: 3 000 000 scaled Groundwater Harvest Potential Map of South Africa, Regional yields of sustainable groundwater abstraction rates, indicate values of 2500 - 4000 m^3/km^2/annum.

*Regional hydrogeological data indicate that the area is characterised by fractured aquifer types. The south eastern aquifer is classed as 'b2' which indicate relatively low yields, estimated to be in the range of 0.1-0.5 l/s. The major proportion of the site is classed as "b3" which indicates low yields of 0.5-2.0l/s. Fractured aquifer (designation b) form as a result of discontinuities, such as faults, fractures and joints, in hard bedrock. These form the primary porosity in which groundwater moves (***Figure *15***).*

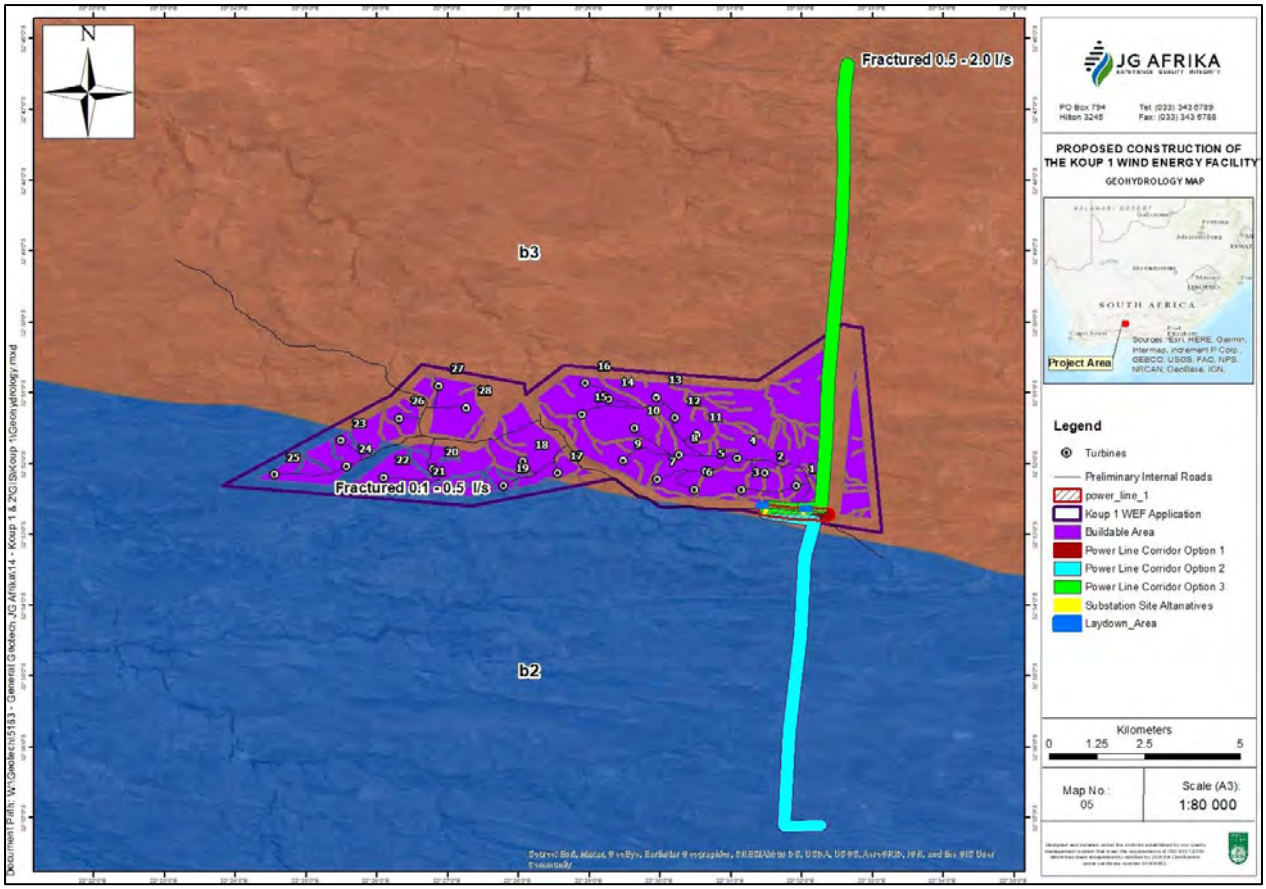


Figure 15: Geohydrology

9.7 Surface Water

An Aquatic Impact Assessment was undertaken by EnviroSci (Pty) Ltd (July 2021). According to the assessment, the study area contains variety of aquatic features associated, characterised as follows:

- *Non perennial rivers alluvial dominated channels with or without riparian vegetation. These ranged from narrow channels within small canyons with steep cliffs to broad flood plain areas in the lower valleys. Some of these did contain small seeps/fountains which sustained small pools of water inhabited by invertebrates and amphibians. However, broad riparian zones are only found within the lower valley areas, dominated by a small number of trees, while obligate instream vegetation is limited to a small number of sedges (nut grasses).*
- *Minor drainage lines, with no obligate aquatic vegetation and were mostly 2 – 8m in width*
- *Dams or weirs with no wetland or aquatic features, although not many of these were located within the study area.*

The features listed above, drain the study area in a north westerly region, forming part of a tributary of the Veldmans River (J21E) Quinary Catchment of the Great Karoo Ecoregion in the Breede-Gouritz Catchment Management Agency (George Regional Office). The Veldmans River in turn drains into the Gamka River.

Figure *16* *indicates the available spatial data with regard potential wetlands and or riverine systems within the study area (van Deventer et al., 2020). During the field work, the site was then groundtruthed as well as compared to 1: 50 000 topocadastral surveys mapping data and that which was observed on site. A baseline map was then refined using the May 2021 survey data, noting that due to the complex nature of the topography and geology, the features were digitised at a scale of 1:10 000 to provide greater accuracy when in close proximity to the proposed infrastructure* (**Figure 22**).

Two main natural aquatic systems were observed within the study area, namely the broader non-perennial rivers and the minor drainage lines. The fine scale delineation of the broader systems was focused on the proposed wind farm infrastructure, to ensure that turbines, buildings and any new internal access roads (as far as possible) avoided these areas. Due to the nature of the landscape, the small drainage lines are unavoidable, but these have also been avoided by the turbines and most of the proposed buildings.

Substation Option 2 and Laydown Options 1 & 2 are however located within minor drainage lines, and for this reason should be relocated and or avoided in the selection process (**Figure 23**).

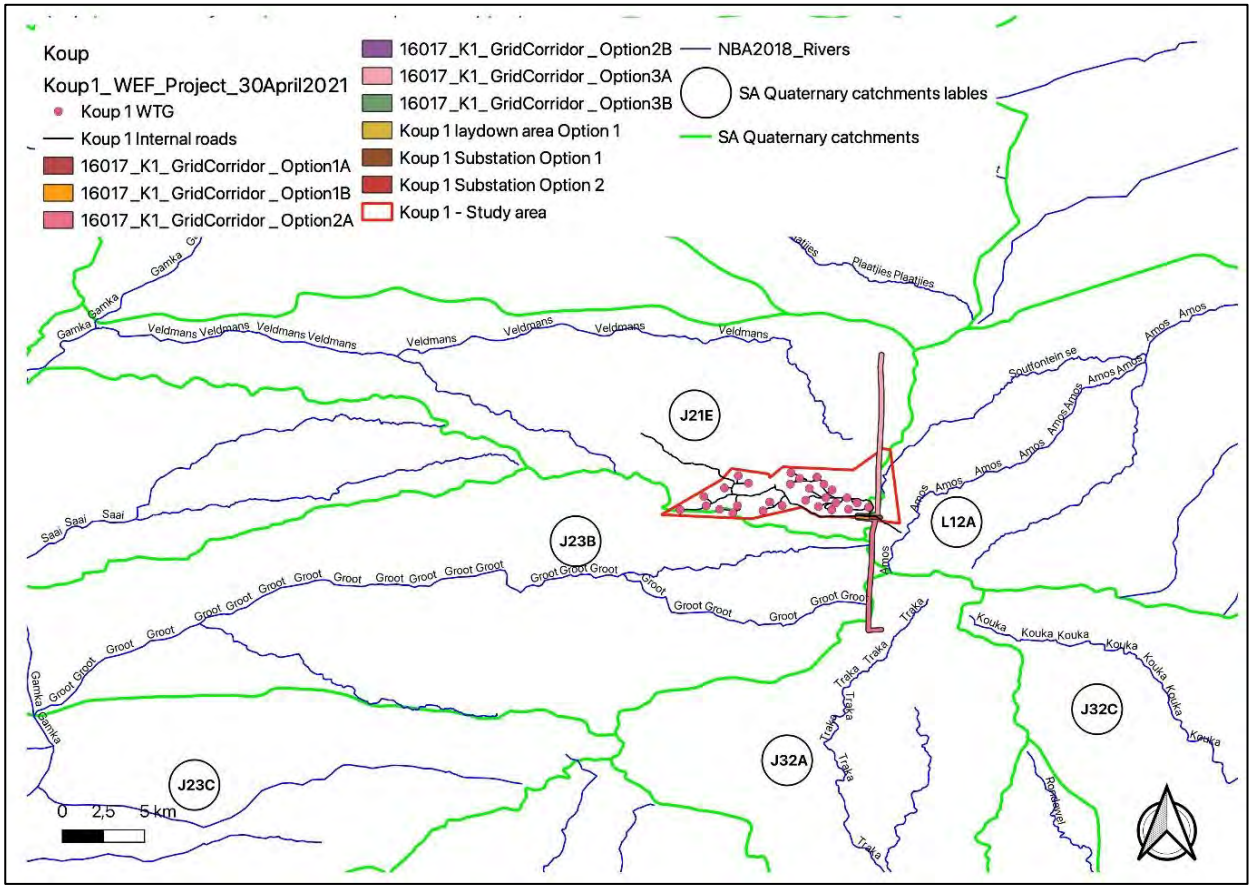


Figure 16 Project locality map indicating the various quaternary catchments and mainstem rivers (Source DWS and NGI) within the project boundary

Figure 17: A broad alluvial watercourse with defined riparian zone

Figure 18: Alluvial channel with undefined channel and or riparian zone

Figure 19: A view of a minor drainage line observed on the upper plateaux where most of the proposed internal roads are located, thus crossings will mostly occur in these areas of the aquatic systems

Figure 20: Several small weirs were found within the steeper valleys through-out the study area, most no longer functional

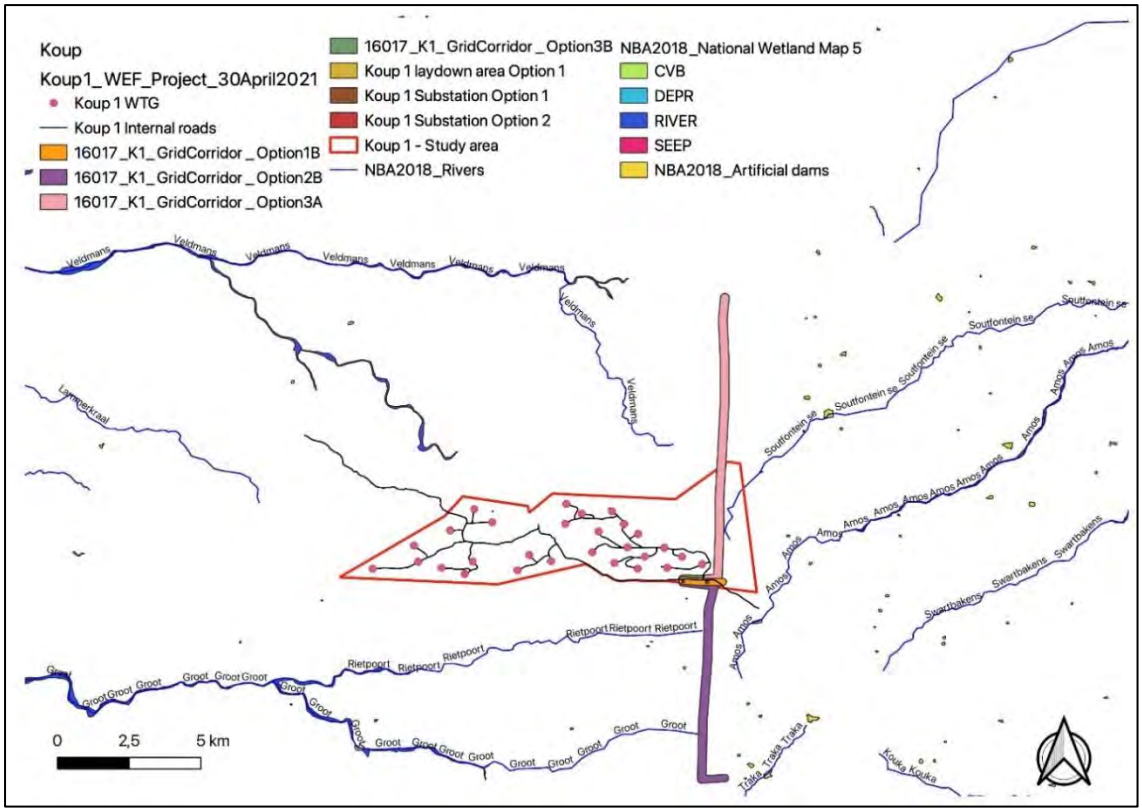


Figure 21: National Wetland Inventory wetlands and waterbodies (van Deventer et al., 2020)

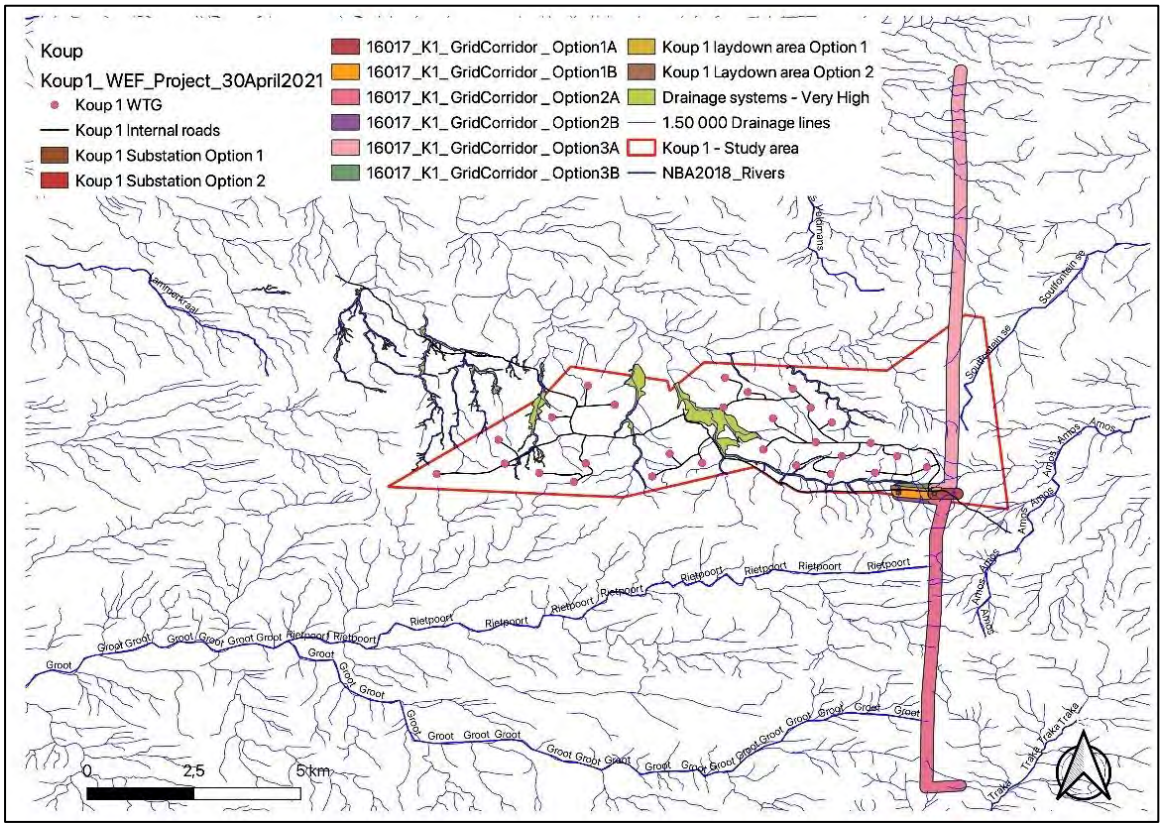


Figure 22: Waterbodies delineated in this assessment based on groundtruthing information collected

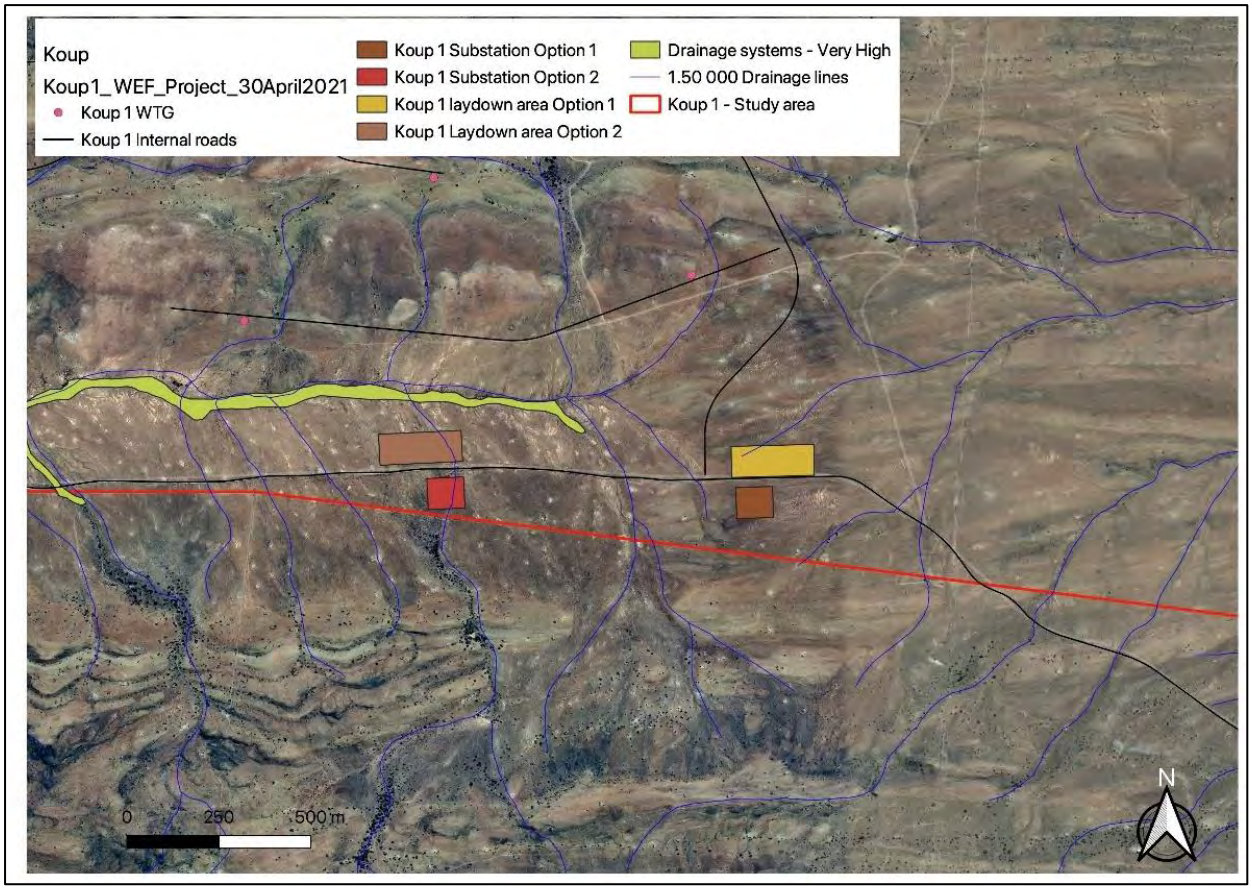


Figure 23: Confirmed and delineated waterbodies in relation to the proposed Substation and laydown area localities.

9.8 Biodiversity (Fauna and Flora)

An Ecological Study was undertaken by Simon Todd (September 2021). According to the report, *the Koup 1 site falls entirely within the Gamka Karoo vegetation type and consists of open gravel plains and low hills dissected by numerous drainage lines. Vegetation cover is generally very low and dominated by low shrubs and scattered low trees. In general, the vegetation of the Koup 1 site is considered low sensitivity and there are few species of concern present. In terms of fauna, the diversity of mammals, reptiles and amphibians is considered relatively low, even by Karoo standards. Although the site falls within the broad distribution of the Riverine Rabbit, the drainage lines of the site do not have extensive floodplains with dense riparian vegetation that represent the typical habitat of this species in the area. The Koup 1 site is therefore considered unsuitable for this species and the development is considered highly unlikely to have any impact on the Riverine Rabbit. The site also falls within the range of the Karoo Padloper and if present it would be associated with the hills of the site with sufficient loose rock and coarse rubble to provide shelter. The low vegetation cover and paucity of such habitat suggests that the site is not an important area for this species and no evidence of this species was observed on the site.*

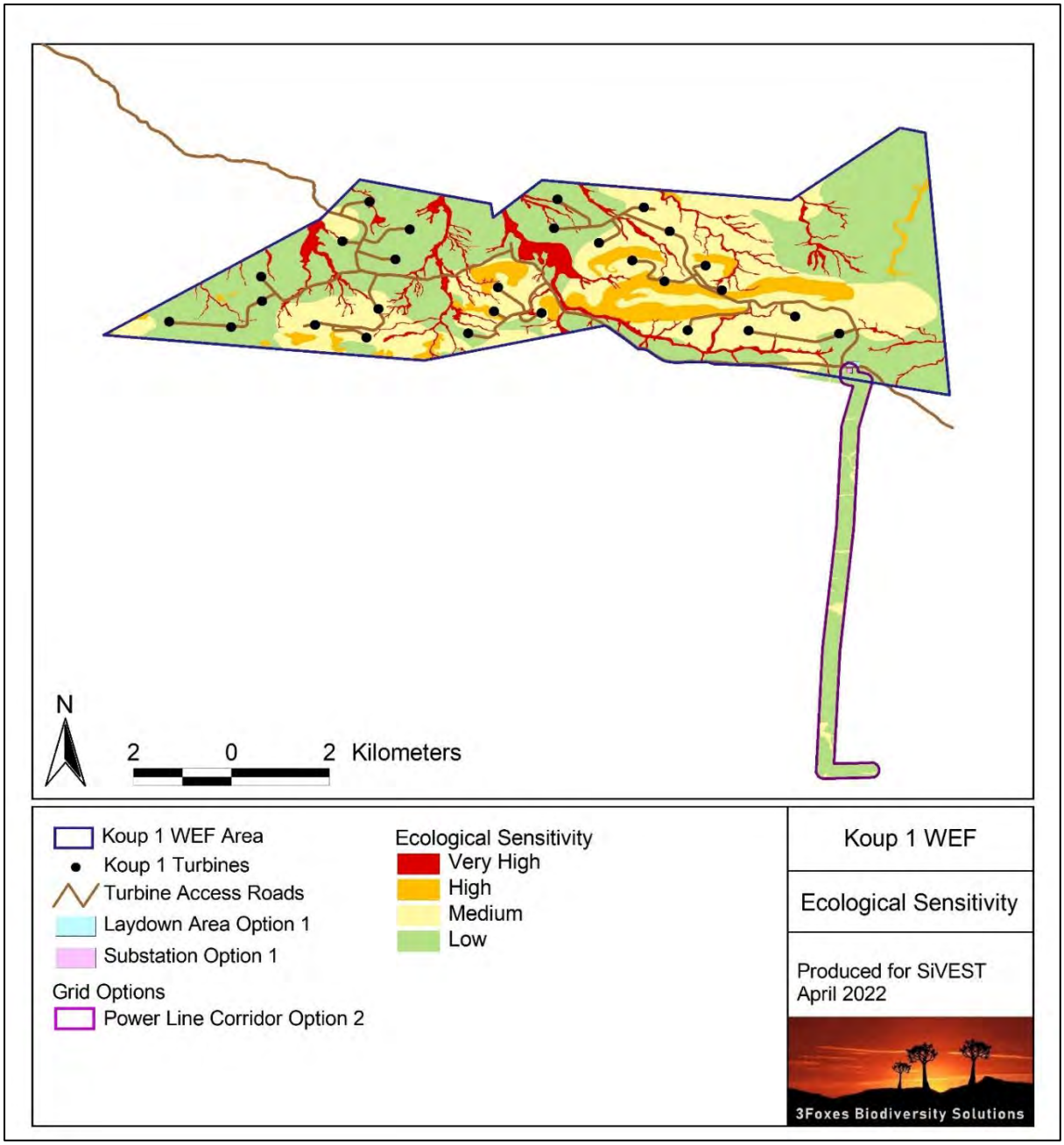


Figure 24: Biodiversity sensitivity map for Koup 1 site

While the smaller drainage features of the site are classified as Ecological Support Areas, there is only one small area of CBA in the east of the site that not be directly impacted by the development. As such impacts on CBAs are considered acceptable for the wind farm and the Grid Connection. In terms of cumulative impacts, the wider area currently has a low development impact from renewable energy and the contribution of the Koup 1 WEF to cumulative impact at less than 50ha is considered relatively low and would not generate significant broad-scale impact. The contribution of the grid connection to cumulative impact would be low and considered acceptable.

9.9 Agricultural

An agricultural compliance statement and site sensitivity verification was undertaken by Johann Lanz (13 August 2021). According to the report, *the site has low agricultural potential because of, predominantly, rainfall constraints, but also due to soil constraints. It is totally unsuitable for cultivation, and agricultural land use is limited to low density grazing. The land is predominantly of low agricultural sensitivity.*

The farm is located in a sheep farming agricultural region, and grazing of sheep and game is the dominant agricultural land use on the site and surrounds. Grazing capacity of the site is low at 32 to 36 hectares per large stock unit.

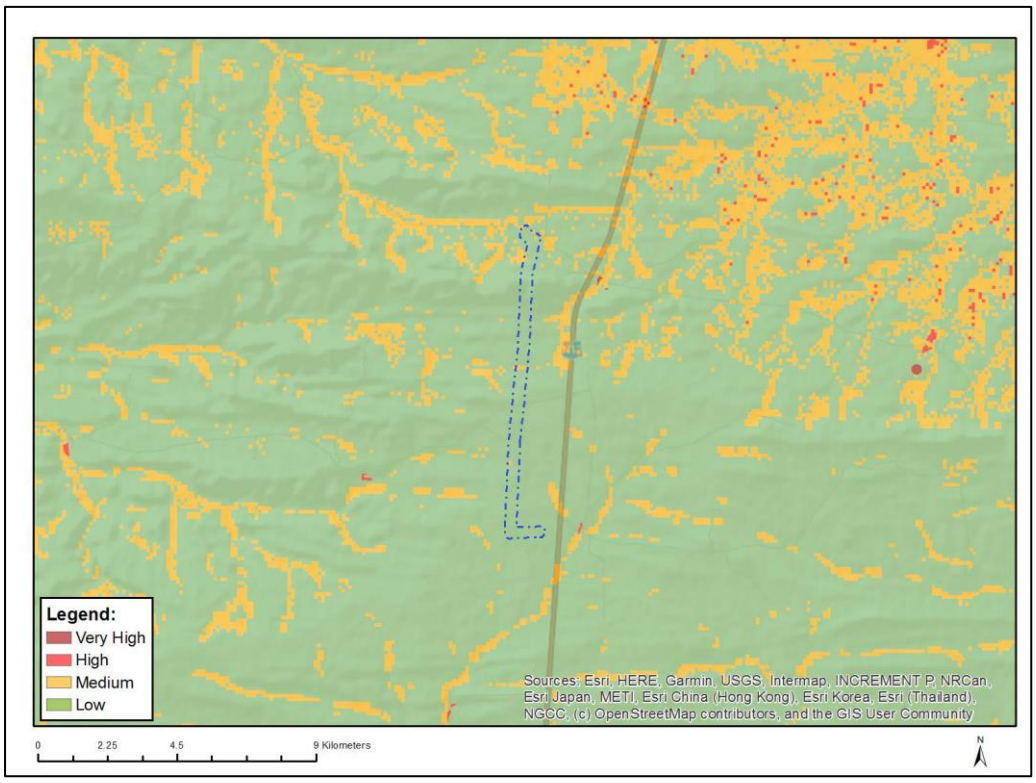


Figure 25: Agricultural sensitivity for the preferred power line option 2 as given by the screening tool (green = low; yellow = medium; red = high; dark red = very high).

Figure 26: Agricultural sensitivity for the preferred substation alternative as given by the screening tool (green = low; yellow = medium; red = high; dark red = very high).

9.10 Avifauna

The application site and immediate environment is classified as Medium to High sensitivity for avifauna according to the Terrestrial Animal Species theme (**Figure *27***)[1]. The development site contains confirmed habitat for species of conservation concern (SCC) as defined in the Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species (Government Gazette No 43855, 30 October 2020, namely listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable. The occurrence of SCC was confirmed during the surveys i.e. Ludwig's Bustard (Globally and Regionally Endangered) and Martial Eagle (Globally and Regionally Endangered) was recorded in the study area. Based on these criteria, the study area classification of High sensitivity for avifauna is confirmed.

[1] It should be noted that there is no Avian theme for powerlines in the screening tool.

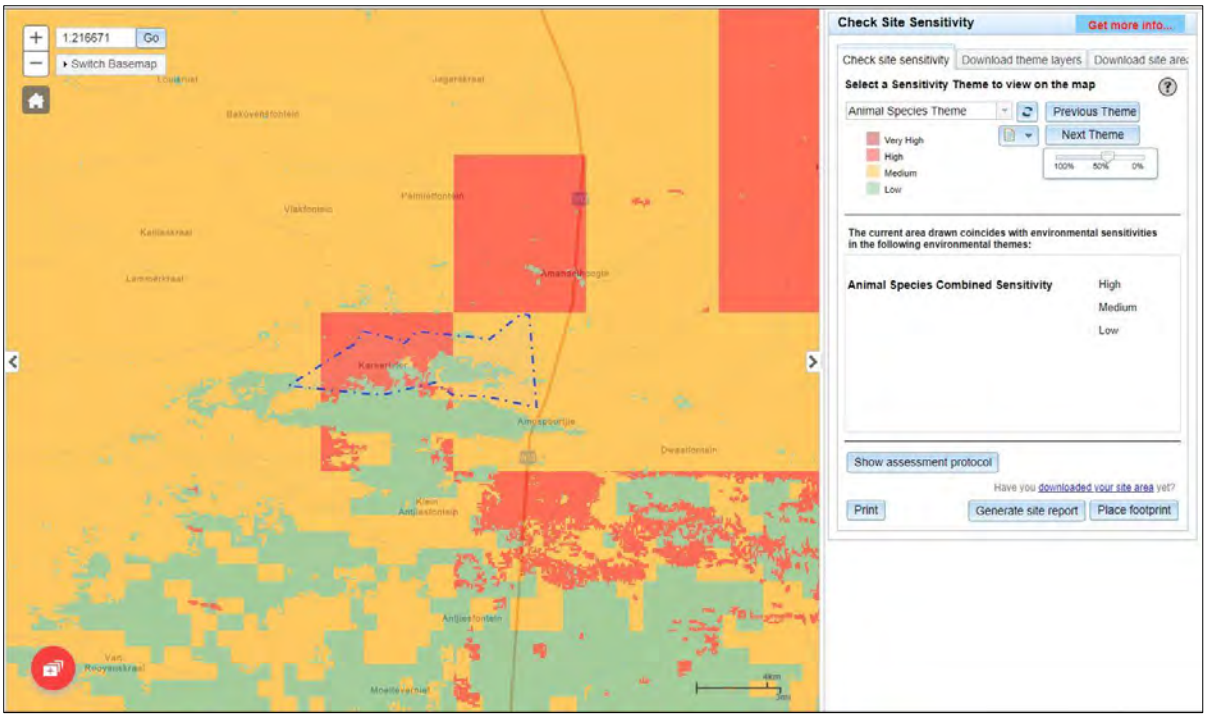


Figure 27: The National Web-Based Environmental Screening Tool map of the application site, indicating sensitivities for the Terrestrial Animal Species theme. The medium to high sensitivity classification is linked to the occurrence of Ludwig's Bustard Neotis ludwigii.

An Avifaunal Assessment was undertaken by Chris van Rooyen Consulting (July 2021). According to the assessment, *it is estimated that a total of 155 bird species could potentially occur in the broader area. Of these, 16 species are classified as priority species for wind development. The Karoo National Park Important Bird Area (IBA) SA102 is the closest IBA and is located approximately 50km north of the application site at its closest point (Marnewick et al. 2015). The development is not expected to have any impact on the avifauna in this IBA due to the distance from the project site.* **Table *13*** *below list all the priority species and the possible impact on the respective species by the proposed powerlines.*

LC = Least Concern
NT = Near threatened
VU = Vulnerable
EN = Endangered

H = High
M = Medium
L = Low

Table 13: Powerline priority species recorded in the broader area

Species	Taxonomic name	Reporting rate		Status		Recorded during surveys	Likelihood of occurrence	Habitat			Impacts		
		Full protocol	Ad hoc protocol	Global status	Regional status			Nama Karoo	Surface water	HV lines	Collisions: HV OHL	Displacement: Disturbance associated with construction of the OHL	Displacement: Habitat transformation in substation
Kori Bustard	*Ardeotis kori*	5.17	0.68	NT	NT		M	x	x		x	x	x
Ludwig's Bustard	*Neotis ludwigii*	12.07	2.05	EN	EN	x	H	x			x	x	x
Common Buzzard	*Buteo buteo*	1.72	0.00				L	x	x	x			

Species	Taxonomic name	Reporting rate		Status		Recorded during surveys	Likelihood of occurrence	Habitat			Impacts		
		Full protocol	Ad hoc protocol	Global status	Regional status			Nama Karoo	Surface water	HV lines	Collisions: HV OHL	Displacement: Disturbance associated with construction of the OHL	Displacement: Habitat transformation in substation
Jackal Buzzard	*Buteo rufofuscus*	1.72	0.00				L	x	x	x			
Blue Crane	*Grus paradisea*	1.72	0.00	VU	NT		L	x	x		x		x
Booted Eagle	*Hieraaetus pennatus*	3.45	0.00				M	x	x	x			
Martial Eagle	*Polemaetus bellicosus*	5.17	0.00	EN	EN	x	H	x	x	x		x	
Verreaux's Eagle	*Aquila verreauxii*	3.45	1.37	LC	VU		L	x	x	x			
Spotted Eagle-Owl	*Bubo africanus*	8.62	2.05				M	x					x
Lanner Falcon	*Falco biarmicus*	1.72	0.00	LC	VU		M	x	x	x			
Pale Chanting Goshawk	*Melierax canorus*	50.00	14.38			x	H	x	x	x			
Black Harrier	*Circus maurus*	3.45	0.00	EN	EN		L	x	x				
Yellow-billed Kite	*Milvus aegyptius*	1.72	0.00				L	x	x				
Karoo Korhaan	*Eupodotis vigorsii*	72.41	25.34	LC	NT	x	H	x			x	x	x
Southern Black Korhaan	*Afrotis afra*	0.00	0.68	VU	VU		L	x			x	x	x
Secretarybird	*Sagittarius serpentarius*	3.45	0.00	EN	VU		M	x	x		x		x
Red-knobbed Coot	*Fulica cristata*	5.17	0.68				L		x		x		
Cape Crow	*Corvus capensis*	37.93	23.29			x	H	x		x			
Pied Crow	*Corvus albus*	70.69	23.29			x	H	x		x			
African Black Duck	*Anas sparsa*	1.72	0.00				L		x		x		
Yellow-billed Duck	*Anas undulata*	1.72	0.00				L		x		x		
Egyptian Goose	*Alopochen aegyptiaca*	36.21	13.01			x	H		x		x		
Helmeted Guineafowl	*Numida meleagris*	12.07	4.79				M	x	x	x			x
Black-headed Heron	*Ardea melanocephala*	6.90	0.00			x	M	x		x	x		
Grey Heron	*Ardea cinerea*	1.72	0.00				L		x		x		
African Sacred Ibis	*Threskiornis aethiopicus*	3.45	0.00				L		x		x		
Greater Kestrel	*Falco rupicoloides*	12.07	8.22				H	x		x		x	
Rock Kestrel	*Falco rupicolus*	10.34	5.48			x	H	x		x			
Black-winged Kite	*Elanus caeruleus*	0.00	0.68				L	x		x			
White-necked Raven	*Corvus albicollis*	17.24	3.42			x	M	x		x			
South African Shelduck	*Tadorna cana*	32.76	8.90			x	H		x		x		
Cape Shoveler	*Spatula smithii*	3.45	0.00				L		x		x		
Cape Teal	*Anas capensis*	1.72	0.68			x	L		x		x		
Red-billed Teal	*Anas erythrorhyncha*	6.90	2.05			x	L		x		x		
Hamerkop	*Scopus umbretta*	1.72	0.00				L		x		x		

The following environmental sensitivities were identified from an avifaunal perspective for the proposed grid connection:

<u>High sensitivity: Surface water – line marking required.</u>
Surface water in this arid habitat is crucially important for priority avifauna, including several Red Data species such as Martial Eagle, Lanner Falcon and Secretarybird, and many non-priority species, including several waterbirds. Drainage lines when flowing also attract waterbirds on occasion, as do the large pools that remain in the channel after the flow has stopped. Powerlines that are placed near these sources of surface water pose a collision risk to birds using the water for drinking and bathing, and drainage lines, when flowing, are natural flight paths for birds. Mitigation in the form of bird flight diverters

is required to mark these sections of line, which should be identified by way of a walk-through by the avifaunal specialist once the tower positions have been finalised.

<u>High sensitivity seasonal No disturbance buffer: Breeding Red Data species nests.</u>
Transmission lines are an important breeding substrate for raptors in the Karoo, due to the lack of large trees (Jenkins et al. 2013). As mentioned before, a Martial Eagle nest is present on Tower 108 of the Droërivier Proteus 1 400kV transmission line, approximately 160m from the closest border of grid Corridor Option 3 (see Appendix 3). In May 2020, both adult birds were observed perching on the towers around the nest, indicating that the territory is active. A 2.5km no disturbance buffer zone must be implemented around the nest. No construction activity should take place in this zone between May and November, which is the breeding season for the birds.

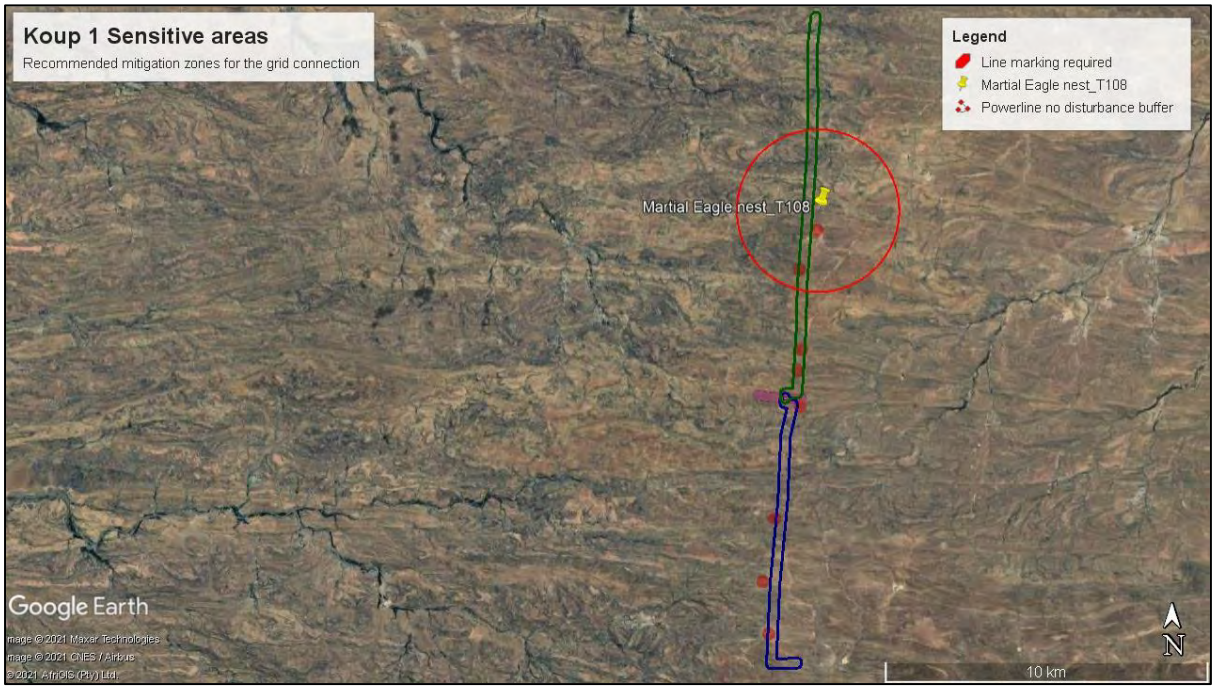


Figure 28: Avifaunal sensitive areas and mitigation zones

The contribution of the Koup 1 WEF grid connection to the cumulative impact of all the grid connections and existing HV lines is thus fairly low. However, the proposed grid connections as a group constitute almost 65% of the planned and existing HV network in the 35km radius around the project and constitute a 185% increase in the length of existing HV line in this area. The contribution of all the grid connections to the cumulative impact of the HV lines in the 35km radius, which is mainly collision mortality of priority species with the powerlines, is therefore high, and the total amount of existing and planned HV lines in the 35km radius, namely 185km, is fairly high as well. The cumulative collision impact of all the grid connections and existing HV lines in the 35km radius is assessed to be medium pre-mitigation and will remain medium post-mitigation

The proposed Koup 1 WEF grid connection will have a moderate impact on avifauna which, in most instances, could be reduced to a low impact through appropriate mitigation. None of the proposed corridor options are fatally flawed, but Corridor Option 1 is preferred, followed by Option 2 and Option 3 in that order. The development is therefore supported, provided the mitigation measures listed in this report are strictly implemented.

10. DESCRIPTION OF THE SOCIO- ECONOMIC ENVIRONMENT

This chapter summarizes the attributes associated with the proposed project study area focusing on the social, economic, heritage and cultural aspects.

10.1 Socio Economic Characteristics

10.1.1 Central Karoo District Municipality

Central Karoo is the largest district in the province, making up a third of its geographical area and covering an area of 39 073.1 km2 in 2016. The district is bordered by the Pixley Ka Seme DM in the north, Namakwa DM in the north-west, Garden Route DM in the south, Sarah Baartman DM in the east and Cape Winelands DM in the west and incorporated the following local municipalities.

- Beaufort West Local Municipality
- Laingsburg Local Municipality
- Prince Albert Local Municipality.

The following cities/towns are also located within the Central Karoo district.

- Beaufort West
- Klaarstroom
- Laingsburg
- Leeu Gamka
- Matjiesfontein
- Merweville
- Murraysburg
- Nelspoort
- Prince Albert
- Welgemoed

The main economic sectors of the district are:

- Agriculture (47%)
- Finance and business services (22%)
- Community services (19%)
- Construction (7%).

With a population of 74 247 people, the Central Karoo district has a population density of 1.9/km^2. According to the Community Survey, 2016; the district has a sex ratio of 93.8 with 25.4% of the population being under 15 years; 67.4% being between 15 and 65 years and 7.2% being over 65 years of age.

10.1.2 Prince Albert Local Municipality

The Prince Albert Local Municipality covers a geographical area of 8 156.9/km^2 making it the smallest of the 3 municipalities in the district. The following towns are within the municipal area.

- Klaarstroom
- Leeu Gamka
- Prince Albert and
- Prince Albert Road.

The main economic sectors of the municipality are.

- Agriculture; and
- Tourism.

With a population of 14 272 people, the Prince Albert LM has a population density of 1.7/km^2. According to Census, 2016 the district has a sex ratio of 94.8 with 23.5% of the population being under 15 years; 69% being between 15 and 64 years and 7.5% being over 65 years of age.

10.1.3 Beaufort West Local Municipality

The Beaufort West Local Municipality covers a geographical area of 21 931.6/km^2 making it the largest of the 3 municipalities in the district. The following towns are within the municipal area.

- Beaufort West
- Merweville
- Murraysburg and
- Nelspoort.

The main economic sectors of the municipality are:

- Transport and communication (25.3%)
- Wholesale and retail trade (16.8%)
- General government services (14.4%)
- Manufacturing (10.9%)
- Agriculture (7.7%).

With a population of 51 080 people, the Beaufort West LM has a population density of 2.3/km2. According to Census, 2016 the district has a sex ratio of 92.7 with 26.6% of the population being under 15 years; 66.5% being between 15 and 64 years and 6.9% being over 65 years of age.

10.2 Cultural/Historical Environment

10.2.1 Archaeological

An Archaeological Impact Assessment was undertaken by PGS Heritage Pty Ltd (September 2021). *The fieldwork conducted for the evaluation of the possible impact of the new Koup 1 WEF and associated grid connection infrastructure has revealed the presence of two structures (Kh001b and Kh001) within the grid corridor option 3. Refer* ***Figure 29*** *below. These structures were recorded as having medium heritage significance. If development occurs within 30m of the farmsteads, the buildings will need to be satisfactorily studied and recorded before impact occurs. Figure 30 represents the heritage resources located within the study area.*

Figure 29: Locality of structures identified within the northern portion of the proposed powerline Corridor 3

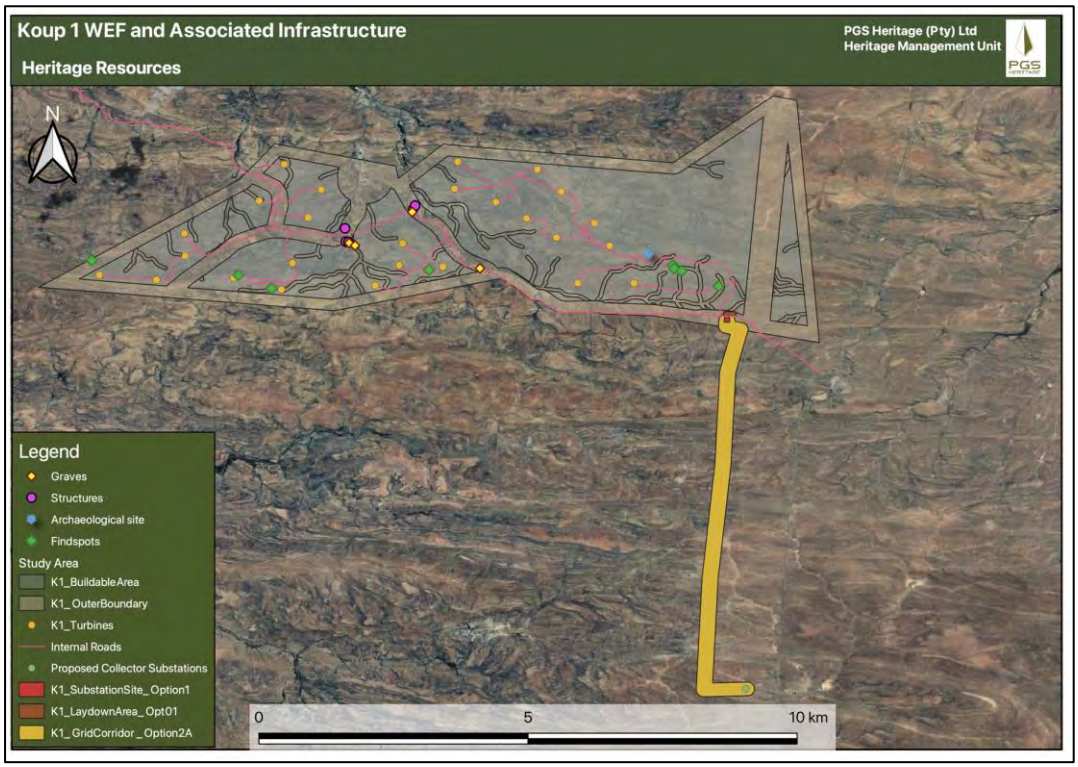


Figure 30: Locality of heritage resources identified within the study area

The following mitigations are required:

- 30m buffer zone around farmsteads
- 30m buffer zone around historical structures
- Monitor find spot areas if construction is going to take place through them.
- A management plan for the heritage resources then needs to be compiled and approved for implementation during construction and operations.

In the event that heritage resources are discovered during site clearance, construction activities must stop in the vicinity, and a qualified archaeologist must be appointed to evaluate and make recommendations on mitigation measures.

The calculated impact confirms the impact of the new Koup 1 WEF and associated grid connection infrastructure will be reduced from negative medium to negative low with the implementation of the mitigation measures. This finding in addition to the implementation of a chance finds procedure, as part of the EMPr, will mitigate possible impacts on unidentified heritage resources.

The overall impact of the Koup 1 WEF, on the heritage resources, is seen as acceptably low after the recommendations have been implemented and therefore, impacts can be mitigated to acceptable levels allowing for the development to be authorised.

10.2.2 Cultural Landscape

A Cultural Landscape Assessment was undertaken by Hearth Heritage as part of the Heritage Impact Assessment (September 2021). *The cultural landscape is a composition of a series of natural layers that have both informed and been formed by the patterns of human use and habitation on that place over time. The nature and shape of the landscape has informed the way in which it has been used, in turn ascribing cultural values to these place-specific features. Through unpacking the layers, landscape character units can be identified which need to be carefully considered in proposed alterations to the landscape.*

The surrounding land use indicates a social appreciation of the natural environment with low impact stock farming with limited farmstead crop cultivation.

Cultural landscapes are a significant factor in the evaluation of the impact of proposed development on cultural heritage resources, tangible (e.g. Historic settlements, landscapes, technological) and intangible (e.g. language, indigenous knowledge systems, oral traditions). The area investigated…is considered as having a high cultural landscape heritage significance.

10.2.3 Regional Cultural Landscape Elements

A description of the regional cultural landscape elements are as follows:

- *"A magnificent natural setting" (Abrahamse, 2013) of arid plains with gently undulating ridges and koppies, framed by the dramatic mountain ranges of the Nieuweveld and Swartberg. This landscape element is the main drawcard for tourism to the area and a national narrative of identity for many South Africans. This scenic beauty and natural sense of place has been celebrated in no less than three national parks being proclaimed in the Koup region, the Karoo National Park, the*

Gamkapoort Nature Reserve and the Swartberg Nature Reserve, not to mention the various private nature reserves in the area.

- *Some of the world's most significant geological and palaeontological sites are located in the Great Karoo, specifically between Beaufort West and Nelspoort, and include ancient rock formations and Late Permian fossils which record the evolution from reptiles to mammals.*
- *The distinct remoteness of the semi-arid Karoo provided a refuge for the displaced San and later the Khoekhoen. The remote settings of mission settlements are associated with the role of religion and an emphasis on social engineering and self-sufficiency (Winter and Oberholzer, 2014). This remote desert wilderness is an essential element to the Central Karoo cultural landscape's sense of place.*
- *Low shrubby vegetation dominates the landscape allowing for distant views of mountain ranges, with taller clusters of trees marking historic points such as cemeteries or farmsteads. Many of the endemic species hold medicinal value for local communities, making these significant as cultural resources.*
- *Although not immediately apparent on travelling through the landscape, significant stone age archaeology, which includes petroglyphs and rock engravings, is common in the area; material cultural remnants of the prehistoric inhabitants of the landscape who lived in intimate dependence on and knowledge of the natural environment, shaping it and being shaped by it over time. This relatively undisturbed area is rich in archaeology, especially near dolorite outcrops due to the presence of underground water and includes stone tool scatters, rock engravings and herder kraals.*
- *Poorts and drifts which navigate the topography of ridges and riverine corridors. These natural crossing points, gaps between the mountain ranges, ridges and undulating hills, and shallower sections of river, have been used by animals and people as the places to traverse the landscape to water, forage, safety or settlements for centuries. These places, acting as funnels of movements across the landscape, therefore, may hold the material scatter of those who passed over them and, where identified historic tracks are still used, these are heritage elements of land use and one of the ways in which the landscape would have determined the movement and, therefore, settlement and interaction of people on the landscape.*
- *Scenic historic movement routes, tarred, gravel and rail, connect the regional towns over the Central Karoo landscape with distant dramatic viewscapes of mountain ranges. These movement routes and patterns to access have informed the settlement patterns of the region. Many of the roads and farm tracks in the study site as well as surrounding area are visible on maps dating back to the 18th and 19th centuries. As a landscape that maintains a dominant characteristic of survival, conflict and change, the roads and paths that cross this landscape are an essential element, connecting the significant points, places of refuge and conflict, trade and subsistence, to each other in a challenging space over time.*
- *A combination of the poort and scenic historic route elements, the historic Swartberg Pass, is an identified historic scenic route and declared Provincial Heritage Site. Further east on the N12 lies Meiringspoort Pass, which predates the Swartberg Pass, and connects Beaufort West with De Rust and Oudtshoorn. Other passes in the region include the Gamkasloof Pass, Seweweekspoort in the Swartberg and the Molteno Pass in the Nuweveld range to the north. Historic mountain passes provided access between coastal plains and the remote interior, and their gateway conditions are typically associated with historical patterns of settlement (Winter and Oberholzer, 2014).*
- *Historic farmsteads with their associated agricultural structures and linking farm roads. Many of the farm werfs include historic structures, built in the regional architecture of packed local stone, now converted into dwellings or sheds. These farmsteads are mostly situated at points of lower elevation, nestled against the hills and ridges where the soils are more suitable for agriculture, and*

where nearby springs or other water sources supply water for livestock and limited cultivation of crops. Amandelhoogte and Vlieefontein have been identified as "significant Cape farmsteads" in Abrahamse's Beaufort West Municipal Heritage Survey (2013).

- *Stone walls and kraals dot the landscape as remnants of stock keeping, road building and fortifications in the area.*
- *Agricultural landscape with livestock, mostly sheep and cattle; fencing and associated structures line and dot the landscape. These are evidence of the human landscape modifications and patterns of land use over millennia, including seasonal grazing and pastoral uses.*
- *Game and nature reserves with live game and associated high fencing, drawing tourists to the region for game viewing and hunting. Game hunting has been continuous on this landscape for millennia since pre-historic inhabitants to the most recent tourist hunters, and attests to the ongoing relationship between humans and the environment in this region. Although a sense of wilderness is experienced when travelling within these reserves, the height of the fences and their increased occurrence does detract from the 'wild' sense of place when travelling the roads around them.*
- *Historic town settlements and landscapes, such as Beaufort West, Prince Albert and Leeu-Gamka, associated to significant events in South Africa's history of survival, conflict and nation-building, including many provincial heritage sites which mark people and places of value to our national estate. Matjiesfontein and the isolated Gamkaskloof Cultural Landscape have Provincial Heritage Site status.*
- *Military posts and forts, historic and current, constructed of local stone; material remains to the frontier zone of conflict and survival that dominated this landscape for so long. Evidence of the Anglo-Boer War in the early 1900s still remains in the form of grave sites and blockhouses along the railway line, and places such as Matjiesfontein and Prince Albert were used as garrisons by the British.*
- *Uranium mining sites dot the region around Beaufort West. Historic gold and diamond prospecting in the region add an additional cultural layout to this element.*
- *Industrial elements of transmission lines and associated infrastructure are evident along the N12 and N1. Due to their limited scale and massing along the N12 currently, they do not overwhelm or detract from the rural and historic sense of place in the area.*

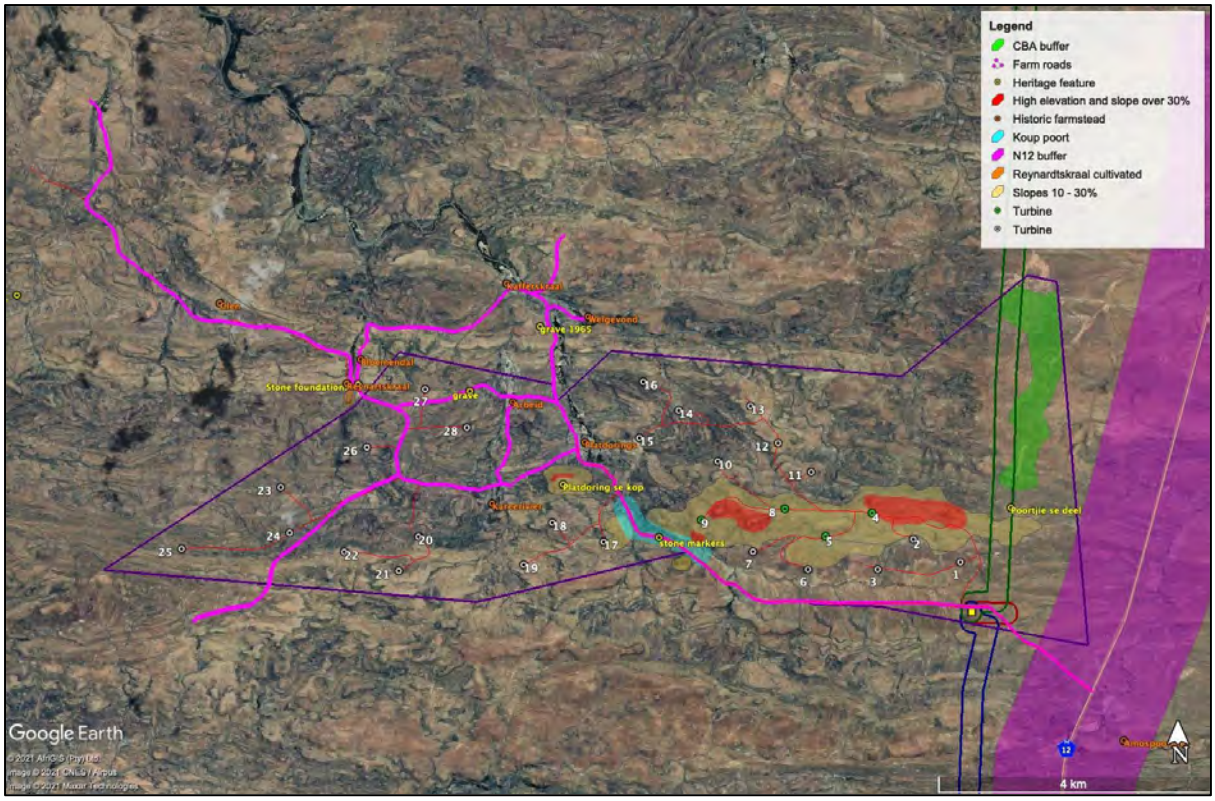


Figure 31: Koup 1 cultural landscape features

In terms of the Koup 2 project, the main negative impacts by WEF development and associated infrastructure to the cultural landscape are on the aesthetic and historic value of the area, including the local residents' opportunity to continue their historic patterns of land use and relationship to the landscape. The historic inhabitants of the area are an essential element to the historic and cultural significance of the cultural landscape and their continued existence in this place with the opportunity to practice traditional land use patterns and knowledge systems are critical in the conservation of the Koup region's intangible heritage. However, with the proposed recommendations of the CLA assessment to be discussed the cumulative negative impact of the proposed WEFs on the cultural landscape can be reduced.

10.2.4 Palaeontological

A Palaeontological Heritage Report was undertaken Natura Viva cc (September 2021). According to the report, *the Koup 1 WEF project area is underlain by continental (fluvial / lacustrine) sediments of the Abrahamskraal and Teekloof Formations (Lower Beaufort Group, Karoo Supergroup) which are of Middle to Late Permian age and are provisionally assigned a Very High sensitivity on the SAHRIS palaeosensitivity map as well as the DFFE screening map. These bedrocks contain sparse, unpredictable to locally concentrated vertebrate fossils as well as rare trace fossils (e.g. tetrapod burrows) and plant material that are of scientific and conservation value. A significant number of new fossil vertebrate sites (cranial and post-cranial material of large-bodied dinocephalians, small dicynodonts, rare tetrapod burrow casts) have been recorded within the combined Koup WEF / grid connection project areas during a 5-day site visit, while several fossil sites have previously been mapped shortly outside its margins. These palaeontological sites, together with their sedimentological context, provide important data for on-going research into the pattern and causes of the Middle Permian Mass Extinction Event on land aroiund 260 million years ago.*

Scientifically-valuable and legally-protected fossil heritage resources preserved at or beneath the ground surface within the project footprint are potentially threated by surface clearance and bedrock excavations during the construction phase of the WEF and grid connection (e.g. for access roads, wind turbine foundations). The majority of the recorded fossil sites lie outside the project footprint but most of the WEF *and grid connection footprint has yet to be palaeontologically surveyed on foot. A significant number of unrecorded sites are likely to exist within or very close to the project footprint.*

No Very High Sensitivity or No-Go palaeontological sites or areas have been identified within the WEF and grid connection. Since all known fossil sites can be readily mitigated through professional recording and collection of fossil material in the pre-construction phase, no recommendations for micro-siting of infrastructure such as wind turbine, pylon positions or access roads are therefore made here. There are no preferences on palaeontological heritage grounds for specific site options for the Koup 1 WEF on-site substation and construction laydown area.

No new fossil sites are recorded within the grid connection project area for the Koup 1 WEF. The corridor terrain traversing the eastern sector of the WEF project area in part comprises topographically subdued vlaktes mantled by palaeontologically insensitive alluvial deposits and surface gravels. Substantial sectors of the corridor options extending north and south outside of the WEF project area have not been surveyed.

Grid connection Option 3 extending to the north traverses more dissected, hilly terrain from which numerous vertebrate fossil sites have been recorded in the past. Comparable hilly terrain to the south of the WEF project area has yielded a concentration of fossil sites close to but west of the grid corridor Option 2 (Almond 2018) Corridor Option 1 lies within the Poortjie Member outcrop area which contains local concentrations of vertebrate fossils in this region of the Karoo.

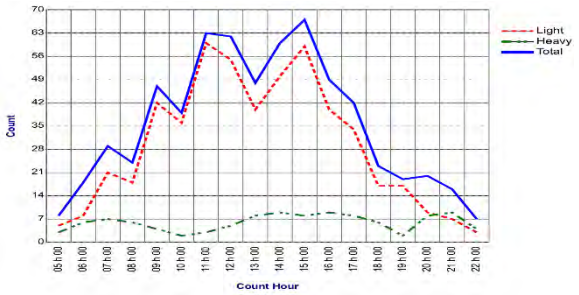
The proposed WEF and grid connection developments are not fatally flawed and, on condition that the recommended mitigation measures are included within the relevant EMPrs and implemented in full, there are no objections on palaeontological heritage grounds to their authorization.

10.3 Transport

A Transportation Impact Assessment was undertaken by SiVEST SA (Pty) Ltd (August 2021). According to the report, *the Western Cape Provincial Government makes use of a Traffic Counting System (TCS) and serves the Western Cape Provincial Network since 1999. The main emphasis of the system is on Trunk, Main and Divisional roads and at the present time only Minor roads that intersect with more important roads are on the system.*

The data indicated below are from two stations on the N12 Freeway, immediately north and south of the proposed development at Km 79.41 and Km 33.23 respectively.

Table 14: Traffic Station Data / Counts

	Light Vehicles	*Heavy Vehicles*	*Total Vehicles*	*Station Count Chart*
N12 @ DR02304 INTERCHANGE *Km79.41* *Station No: 2126A* *Date: 12/09/2016*				
Morning 7:00-8:00	*19*	*6*	*25*	
Afternoon 16:00-17:00	*35*	*8*	*43*	
Average Annual Daily Trips	*629*	*136*	*765*	
N12 @ DR02301 INTERCHANGE *Km33.23* *Station No: 2125C* *Date: 25/10/2017*				
Morning 7:00-8:00	*19*	*6*	*25*	
Afternoon 16:00-17:00	*35*	*8*	*43*	
Average Annual Daily Trips	*629*	*136*	*765*	

Based *on the table above, it can be concluded that the existing peak traffic on this section of road is a 'Weekday Midday' peak hour traffic between 10:00 – 16:00.*

10.4 Visual

A Visual Impact Assessment was undertaken by SiVEST SA (Pty) Ltd (July 2021). According to the report, *WEF and power line developments are not features of the natural environment, but are rather a representation of human (anthropogenic) alteration. As such, these developments are likely to be perceived as visually intrusive when placed in largely undeveloped landscapes that have a natural scenic quality and where tourism activities are practised that are dependent on the enjoyment of, or exposure to, the scenic or aesthetic character of the area. Residents and visitors to these areas could perceive the development to be highly incongruous in this context and may regard the development as an unwelcome intrusion which degrades the natural character and scenic beauty of the area, and which could potentially even compromise the practising of tourism activities in the area. In this instance however, the area is not typically valued for its tourism significance and no formal protected areas were identified in the broader area. In addition, very few, leisure-based tourism activities, and no recognized tourism routes were identified in the study area.*

The predominant land use in the area (sheep farming) has not transformed the natural landscape across much of the study area to any significant degree and there are no towns or built-up areas in the study area influencing the overall visual character. Thus there are low levels of human transformation and visual degradation across a significant portion of the study area and the natural character has been retained.

There are however prominent anthropogenic elements in the study area however which include the N12 National Route and 400kV power lines. Other, less prominent elements present in the area include lower voltage power lines, telephone poles, windmills, gravel farm access roads and farm boundary fences. The presence of this infrastructure is an important factor in this context, as the introduction of the proposed WEF and associated grid connection infrastructure would result in less visual contrast where other anthropogenic elements are already present.

The typical Karoo landscape consisting of wide open plains, and isolated relief, interspersed with isolated farmsteads, windmills and stock holding pens, is an important part of the cultural matrix of the South African environment. In light of this, it is important to assess whether the introduction of a WEF and associated infrastructure into the study area would be a degrading factor in the context of the natural Karoo character of the landscape. Broadly speaking, visual impacts on the cultural landscape in the area around the proposed development would be reduced by the fact that the area is relatively remote and there are few tourism or nature-based facilities in the study area. In addition, although the elements of the proposed Koup 1 WEF and grid connection infrastructure would potentially be visible from the N12 national route, the section of this route that traverses the study area does not form part of a designated scenic route and is not expected to experience heavy volumes of tourist traffic.

In order to assess the visual sensitivity of the area, SiVEST has developed a matrix based on the characteristics of the receiving environment which, according to the Guidelines for Involving Visual and Aesthetic Specialists in the EIA Processes, indicate that visibility and aesthetics are likely to be 'key issues' (Oberholzer: 2005).

GIS-based visibility analysis was again used to determine which sectors of the grid assessment corridors would be visible to the highest numbers of receptors in the study area. Although sections of the assessment corridors are expected to be visible from most of the identified receptor locations, one section of Corridor Option 2 is expected to be significantly more visible than all other sections. This section is located immediately south of the Koup 1 WEF application site where the proposed power line route alignment traverses a prominent ridge. While this could be seen as an area of potentially high visual sensitivity, given the low to moderate visual sensitivity rating of the study area as a whole, the sensitivity of the ridge would be reduced to "Medium-High". Hence this is not considered to be a "no go area", but rather should be viewed as a zone where power line development would be least preferred.

Additional areas of potential visual sensitivity have been delineated around the identified receptors located within 500m of the grid assessment corridor, these being VR 25 and VR45 which are farmsteads located on Portions 19 and 24 of the Farm Brits Eigendom No 374 respectively. Receptor VR25 is inside power line corridor Option 2, while VR45 is inside power line corridor Option 3. As such, these receptors would be subject to high levels of visual impact from the proposed power lines. The level of visual impact experienced would however be reduced as a result of the proximity of both of these farmsteads to the existing 400kV power lines. The level of impact would also largely depend on the sentiments of the owners/occupants of the farmsteads towards the proposed development and this is not known at this stage. As such, 500 m buffers around the sites were delineated as areas of potential visual sensitivity.

The areas of visual sensitivity affecting the grid connection infrastructure are shown in the figure below.

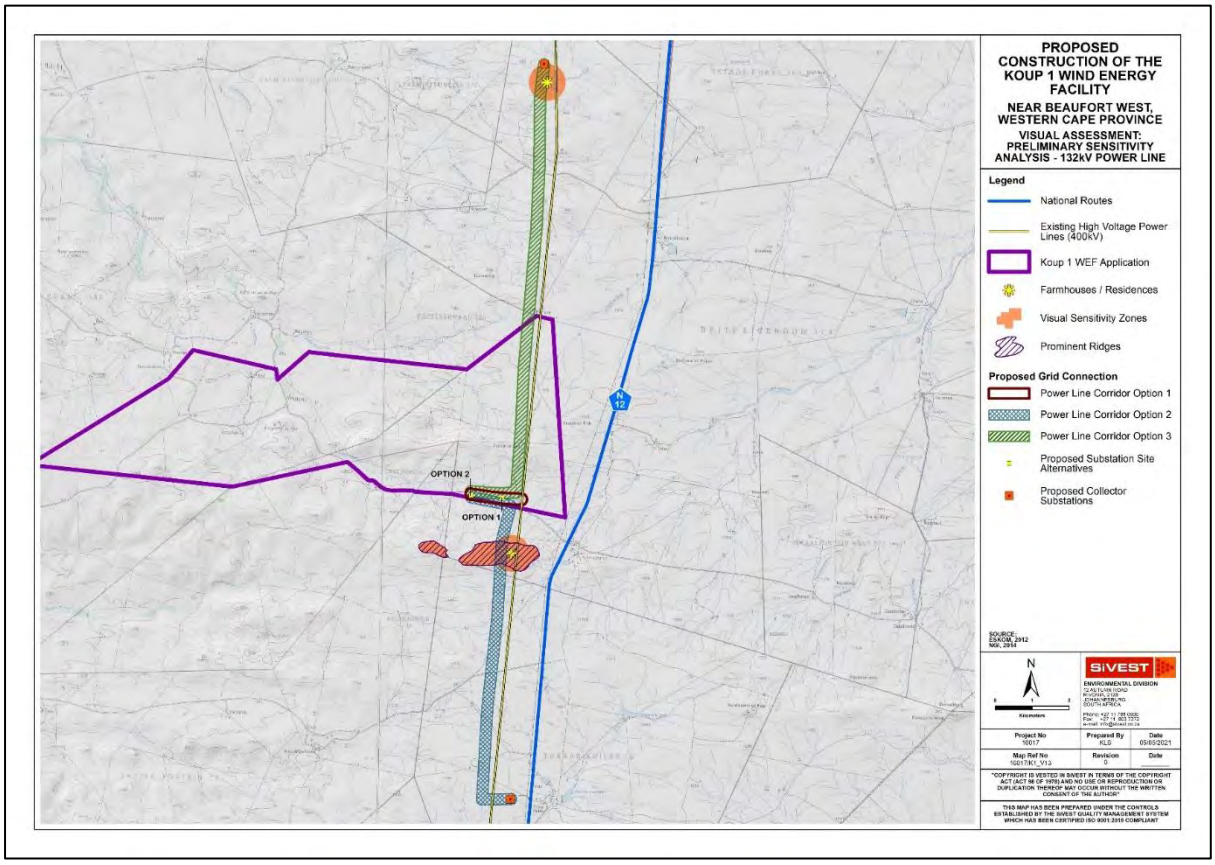


Figure 32: Visual sensitivity along the powerline assessment corridors

Preliminary desktop assessment of the combined study area for the proposed Koup 1 WEF and the associated grid connection infrastructure identified forty-six (46) potentially sensitive visual receptor locations, most of which appear to be existing farmsteads. Fifteen (15) of the receptors are located within 5km of the powerline corridor.

Three of the receptors identified were found to be linked to leisure-based (specifically nature-based) tourism and are therefore considered to be sensitive receptors. These receptors are as follows:

- *Rietpoort Game Farm;*
- *ROAM Safari Lodge and*
- *Silwerkaroo Guest House.*

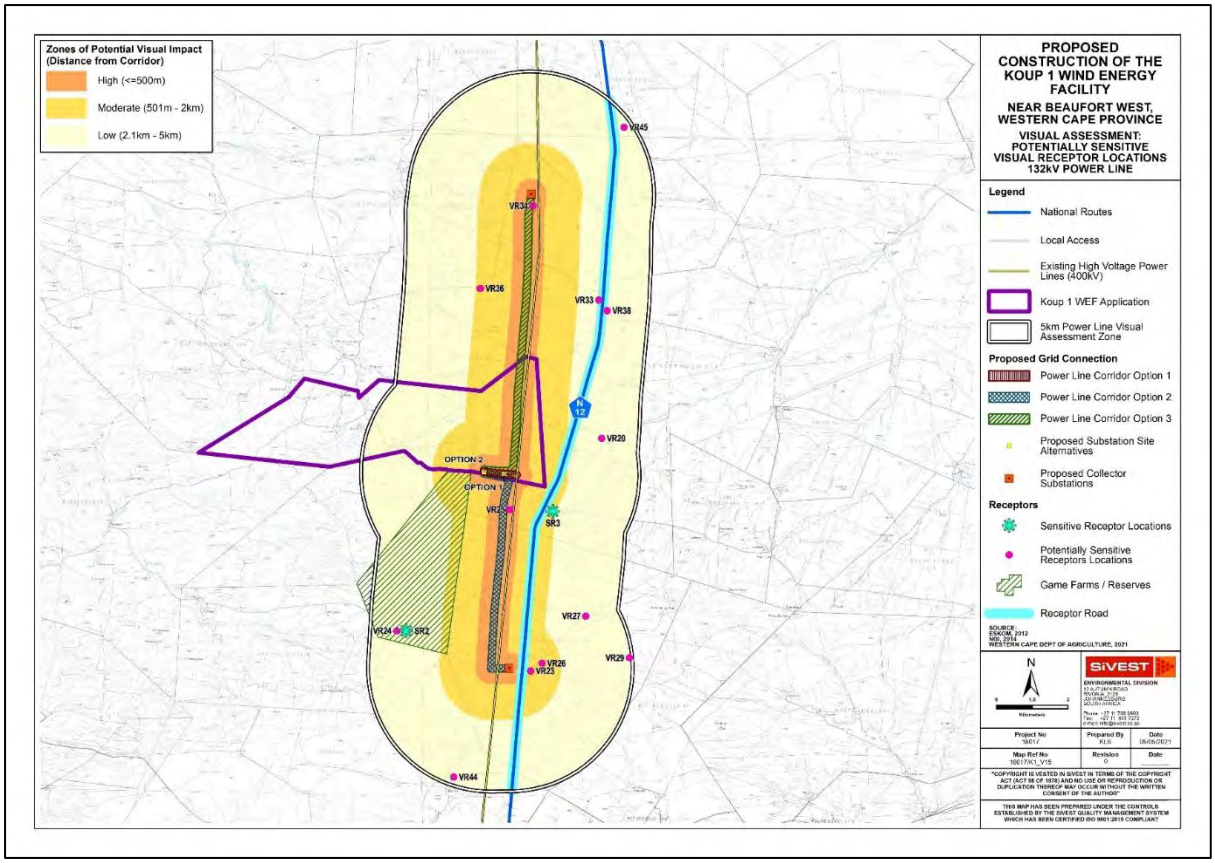


Figure 33: Potentially sensitive receptor locations within with 5kms of the powerline corridor

Neither of the two sensitive receptors identified within 5km of the power line assessment corridors would experience high levels of visual impact as a result of the proposed 132kV power line associated with the Koup 1 WEF development. These receptors are however expected to experience moderate levels of visual impact as a result of the power line development.

Two (2) of the potentially sensitive receptor locations are expected to experience high levels of visual impact as a result of the proposed power line. The high sensitivity rating relates largely to the fact that these receptors are located in in close proximity to the proposed power line route alignments. Both of these receptors are in fact also located close to existing 400kV power lines and this factor is expected to reduce the level of visual impact resulting from new power lines. Furthermore, neither of these receptors are tourism-related facilities and as such they are not considered to be Sensitive Receptors. Thus the high impact rating assigned will not affect the overall impact ratings.

No fatal flaws were identified for any of the grid connection infrastructure alternatives. Power Line Corridor Option 1 was identified as the Preferred Alternative, while Power Line Corridor Options 2 and 3 were found to be favourable.

11. POLICY AND LEGISLATIVE CONTEXT

The relationship between the project and certain key pieces of environmental legislation is discussed in the subsections to follow.

11.1 The Constitution

The Constitution of the Republic of South Africa, Act 108 of 1996 sets the legal context in which environmental law in South Africa occurs and was formulated. All environmental aspects should be interpreted within the context of the Constitution, National Environmental Management Act 107 of 1998 and the Environment Conservation Act 73 of 1989.

The Constitution has enhanced the status of the environment by virtue of the fact that an environmental right has been established (Section 24) and because other rights created in the Bill of Rights may impact on environmental management through, for example, access to health care, food and water and social security (Section 27). An objective of local government is to provide a safe and healthy environment (Section 152) and public administration must be accountable, transparent and encourage participation (Section 195(1) (e) to (g)).

Section 24 of the Constitution 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:*
  - *Prevent pollution and ecological degradation;*
  - *Promote conservation and*
  - *Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."*

The Constitution is the overarching legislation for South Africa. Although it provides for certain rights and obligations, the NEMA has been promulgated in order to manage the various spheres of both the social and natural environment.

11.2 National Environmental Management Act (107 of 1998)

The National Environmental Management Act (Act No. 107 of 1998) was promulgated in 1998 but has since been amended on several occasions from this date.

The act intends to provide for:

a) co-operative environmental governance by establishing principles for decision-making on matters affecting the environment;
b) institutions that will promote co-operative governance and procedures for coordinating environmental functions exercised by organs of state;
c) to provide for the prohibition, restriction or control of activities which are likely to have a detrimental effect on the environment; and
d) to provide for matters connected therewith.

NEMA is the overarching legislation which governs the BA process and environmental management in South Africa. Sections 24 and 44 of NEMA make provision for the promulgation of regulations that identify activities which may not commence without an EA. Activities that may significantly affect the environment must be considered, investigated and assessed prior to implementation.

According to Section 2(3) of the National Environmental Management Act (NEMA) (Act No. 107 of 1998), "development must be socially, environmentally and economically sustainable", which means the integration of these three factors into planning, implementation and decision-making so as to ensure that development serves present and future generations.

The EIA Regulations, 2014 (as amended) identify lists of activities which have the potential to result in detrimental environmental impacts and thus require EA, subject to either "Basic Assessment" or "Scoping and Environmental Impact Assessment". The Regulations prescribe the procedural and substantive requirements for the undertaking of EIAs and the issue of EA's.

The proposed project triggers listed activities under Listing Notice 1, and 3 and thus requires an EA subject to a Basic Assessment (BA) Process. The listed activities are further detailed in Section 7 above.

11.3 Environmental Impact Assessment (EIA) Guideline for Renewable Energy Projects, DFFE Notice 989 of 2015

The purpose of this document is primarily to provide guidance on the environmental management legal framework applicable to renewable energy operations and all the role players in the sector. The guideline is principally intended for use by the following stakeholder groups:

- Public Sector Authorities (as regulator and/or competent authority);
- Joint public sector authorities and project funders (e.g., Eskom, IDC, etc.);
- Private Sector Entities (as project funder / developer / consultant); and
- Other interested and affected parties (as determined by the project location and/or scope).

This guideline seeks to identify activities requiring authorisation prior to commencement of that activity and provide an interface between national EIA Regulations and other legislative requirements of various authorities.

The guidelines are applicable for the construction, installation and/or development of the following renewable energy projects:

- Concentrating Solar Power (CSP) Plant;
- Wind Energy Facility (WEF);
- Hydropower Station; and
- Photovoltaic (PV) Power Plant.

As the proposed development is for electricity distribution infrastructure (namely an on-site substation and powerlines) which will serve the Koup 1 WEF (part of a separate respective EIA process), it is subject to the recommendations proposed in the guidelines.

11.4 National Water Act (Act 36 of 1998)

The National Water Act (NWA) No 36 of 1998 was promulgated on the 20th of August 1998. This Act is important in that it provides a framework to protect water resources against over exploitation and to ensure that there is water for socio-economic and economic development, human needs and to meet the needs of the aquatic environment. The Act also recognises that water belongs to the whole nation for the benefit of all people.

Water resources as defined include a watercourse, surface water, estuary or aquifer. Specifically, a watercourse is defined as (inter alia):

- A river or spring;
- A natural channel in which water flows regularly or intermittently; and
- A wetland, lake or dam into which, or from which water flows.

Due to the possible encroachment into the wetland areas, the following Section 21 water uses in terms of the NWA may be triggered and require licensing:

(c) impeding or diverting the flow of water in a watercourse; and
(i) altering the bed, banks, course or characteristics of a watercourse.

In light of the above, there are a number of stipulations within the NWA that are relevant to the potential impacts on rivers, streams and wetlands that may be associated with the proposed development. A Surface Water Impact Assessment (**Appendix 6**) has however been conducted to explore how the proposed development may impact on identified water resources as protected by the Act. Should the proposed development require a General Authorisation (GA) or Water Use Licence (WUL), it will be determined and applied for separately prior to construction.

11.5 The National Heritage Resources Act 1999 (25 of 1999)

The National Heritage Resources Act promotes good management of the heritage resources of South Africa which are deemed to have cultural significance and to enable and encourage communities to ensure that these resources are maintained for future generations.

The aim of the Act is to introduce an integrated, three-tier system for the identification, assessment and management of national heritage resources (operating at a national, provincial and local level). This legislation makes provision for a grading system for the evaluation of heritage resources on three levels which broadly coincide with their national, provincial and local significance.

This Act requires investigation to determine the impact of heritage resources when developments exceed the thresholds list in section 38 (1) of the act:

(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
(b) the construction of a bridge or similar structure exceeding 50 m in length;
(c) any development or other activity which will change the character of a site—
    (i) exceeding 5 000 m^2 in extent; or
    (ii) involving three or more existing erven or subdivisions thereof; or

(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

(d) the re-zoning of a site exceeding 10 000 m^2 in extent; or
(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,

The proposed development would involve; (a) the construction of a powerline exceeding 300m in length, (c) the development of grid connection infrastructure (substation) that will change the character of more than 0.5ha, and (d), the rezoning of a site that will exceed 1ha.

Under the legislation the South African Heritage Resources Agency (SAHRA), was established, which replaced the National Monuments Council. SAHRA is responsible for the preservation of heritage resources with exceptional qualities of special national significance (Grade I sites). A Provincial Heritage Resources Authority, established in each province, will protect Grade II heritage resources which are significance within the context of a province or region. Buildings and sites of local interest (Grade III sites) is the responsibility of local authorities as part of their planning functions. In this case, the Heritage Western Cape (HWC) will need to be consulted with extensively throughout the process.

A Notice of Intent to develop (NID) was submitted to HWC by PGS Heritage on the 6th of October 2021.

Within the scope of this project, Section 38 of the NHRA (25 of 1999), states that, as described above, an assessment of potential heritage resources in the development area needs to be done. A Heritage Impact Assessment (HIA), Archaeological Impact Assessment (AIA), Paleontological Impact Assessment (PIA) and Cultural Landscape Assessment (CLA) has therefore been commissioned to explore how the proposed development may impact on heritage resources and potential cultural artefacts as protected by the Act.

11.6 National Environmental Management: Biodiversity Act (NEM:BA) (Act No. 10 of 2004, as amended)

As the principal national act regulating biodiversity protection, the National Environmental Management: Biodiversity Act (NEM:BA) (Act No. 10 of 2004), which is administered by the DFFE, is concerned with the management and conservation of biological diversity, as well as the use of indigenous biological resources in a sustainable manner. The term biodiversity, according to the Convention on Biodiversity (CBD), refers to the variability among living organisms from all sources including, inter alia terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity in genes, species and ecosystems.

The overarching aim of the NEM:BA, within the framework of the NEMA, is to provide for:

- The management and conservation of biological diversity within South Africa, and of the components of such biological diversity;
- The use of indigenous biological resources in a sustainable manner; and
- The fair and equitable sharing among stakeholders of benefits arising from bio-prospecting involving indigenous biological resources.

In terms of this Act, the developer has a responsibility to:

- Conserve endangered ecosystems and restriction of activities according to the categorisation of the area (not just by listed activity as specified in the EIA regulations);
- Promote the application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all development within the area are in line with ecological sustainable development and protection of biodiversity; and
- Limit further loss of biodiversity and conserve endangered ecosystems.

The South African National Biodiversity Institute (SANBI) was established in terms of the NEM:BA, its purpose being (inter alia) to report on the status of the country's biodiversity and the conservation status of all listed threatened or protected species and ecosystems.

The NEM:BA provides for a range of measures to protect ecosystems and for the protection of species that are threatened or in need of protection to ensure their survival in the wild, including a prohibition on carrying out a 'restricted activity' involving a specimen of a listed threatened or protected species without a permit issued in terms of Chapter 7 of the Act. According to Section 57 of the Act, 'Restricted activities involving listed threatened or protected species':

A Biodiversity Assessment (**Appendix 6**) has been conducted to explore how the proposed development may impact on biodiversity as protected by the Act. Should the proposed development require offsets or permits, it will be determined and applied for separately prior to construction**.**

In addition, all relevant conservation departments (such as the SANBI and Cape Nature) will be invited to provide comments with regards to the proposed development.

11.7 National Environmental Management: Protected Areas Act, 2003 (Act No.57 of 2003 as amended)

The overarching aim of the National Environmental Management: Protected Areas Act (NEMPAA) No. 57 of 2003, within the framework of NEMA, is to provide for:

- the declaration and management of protected areas;
- co-operative governance in the declaration and management of protected areas;
- effect a national system of protected areas in South Africa as part of a strategy to manage and conserve its biodiversity;
- a representative network of protected areas on state land, private land and communal land;
- promote sustainable utilisation of protected areas for the benefit of people, in a manner that would preserve the ecological character of such areas;
- promote participation of local communities in the management of protected areas, where appropriate; and
- the continued existence of South African National Parks.

The proposed project is not located in close proximity to any protected areas.

11.8 National Forests Act (NFA) (Act No. 84 of 1998)

The National Forest Act (NFA) (Act No. 24 of 1998) was enacted to:

- Provide for the protection, management and utilisation of forests;
- The protection of certain plant and animal life;
- The regulation of trade in forest produce; and
- The control and management of a national hiking way system and National Botanic Gardens.

The NFA enforces the necessity for a license to be obtained prior to destroying any indigenous tree in a natural forest and, subject to certain exemptions, cutting, disturbing, damaging, destroying or removing any protected tree. The list of protected trees is currently contained in GN 908 of 21 November 2014. Licenses are issued by the Minister and are subject to periods and conditions as may be stipulated.

Protected trees
According to this act, the Minister may declare a tree, group of trees, woodland or a species of trees as protected. The prohibitions provide that 'no person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister'.

Forests
Prohibits the destruction of indigenous trees in any natural forest without a licence.

The NFA is relevant to the proposed development as the removal and/or disturbance and/or clearance of indigenous vegetation will be required and a license in terms of the NFA may be required for this to be done.

A Biodiversity Assessment (**Appendix 6**) has been conducted to explore how the proposed development may impact on vegetation as protected by the Act.

In addition, all relevant conservation departments (such as the SANBI and Cape Nature) will be invited to provide comments with regards to the proposed development.

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

Provides requirements for veldfire prevention through firebreaks and required measures for firefighting. Chapter 4 of the Act places a duty on landowners to prepare and maintain firebreaks. Chapter 5 of the Act places a duty on all landowners to acquire equipment and have available personnel to fight fires.

11.10 Conservation of Agricultural Resources Act (CARA) (Act No. 43 of 1983)

The Conservation of Agricultural Resources Act (CARA) (Act No. 43 of 1983) controls the utilisation of natural agricultural resources in South Africa. The Act promotes the conservation of soil, water sources and vegetation as well as the combating weeds and invader plants. The Act requires the protection of land against soil erosion and the prevention of water logging and salinization of soils by means of suitable soil conservation works to be constructed and maintained. The utilisation of marshes, water sponges and watercourses are also addressed.

The primary objective of the Act is to conserve natural agricultural resources by:

- maintaining the production potential of land;
- combating and preventing erosion and weakening or destruction of the water resources;

- protecting vegetation; and
- combating weeds and invaders plants.

In terms of this Act, no degradation of natural land is permitted. Rehabilitation after disturbance to agricultural land is also managed by this Act. The CARA is relevant to the proposed development as the construction of a solar PV plant as well as other components (such as the on-site switching substation and permanent guard house) may impact on agricultural resources and vegetation on the site. The Act prohibits the spreading of weeds and prescribes control measures that need to be complied with in order to achieve this. As such, measures will need to be taken to protect agricultural resources and prevent weeds and exotic plants from invading the site as a result of the proposed development.

Declared Weeds and Invaders in South Africa are categorised according to one (1) of the following categories:

- Category 1 plants: are prohibited and must be controlled.
- Category 2 plants: (commercially used plants) may be grown in demarcated areas providing that there is a permit and that steps are taken to prevent their spread.
- Category 3 plants: (ornamentally used plants) may no longer be planted; existing plants may remain, as long as all reasonable steps are taken to prevent the spreading thereof, except within the flood line of watercourses and wetlands.

An Agricultural and Soils Site Verification **(Appendix 6)** has been conducted to explore how the proposed development may impact on the agricultural production potential of the proposed site. According to this assessment, the potential impact on the loss of agricultural land will be low and the site is totally unsuitable for cultivation, and agricultural land use is limited to low density grazing. The land is therefore predominantly of low agricultural sensitivity. As such, no application in terms of CARA was recommended.

11.11 National Road Traffic Act (NRTA) (Act No. 93 of 1996, as amended)

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

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

11.12 Civil Aviation Act (CAA) (Act No. 13 of 2009)

The Civil Aviation Act (CAA) (Act No. 13 of 2009) controls and regulates aviation within South Africa. It provides for the establishment of a South African Civil Aviation Authority (SACAA) and independent Aviation Safety Investigation Board in compliance with Annexure 13 of the Chicago Convention. It gives effect to various conventions related to aircraft offences, civil aviation safety and security, and provides for additional measures directed at more effective control of the safety and security of aircrafts, airports and matters connected thereto.

Although the Act is not directly relevant to the proposed development, it should be considered as the establishment of electricity distribution infrastructure (such as a substation and powerlines) may impact on aviation and air traffic safety, if located directly within aircraft flight paths.

The Air Traffic and Navigation Services Company Limited (ATNS) and the SACAA will be consulted throughout the BA process and the required approvals will be obtained, where necessary. It is not however anticipated that any approvals will be required.

11.13 Astronomy Geographic Advantage Act (Act No. 21 of 2007)

The Astronomy Geographic Advantage Act (Act No. 21 of 2007) provides for:

- The preservation and protection of areas that are uniquely suited for optical and radio astronomy; and
- Intergovernmental cooperation and public consultation on matters concerning nationally significant astronomy advantage areas and matters connected therewith.

Under Section 22(1) of the Act, the Minister has the authority to protect the radio frequency spectrum for astronomy observations within a core or central astronomy advantage area. As such, the Minister may under section 23(1) of the Act, declare that no person may undertake certain activities within a core or central Astronomy Advantage Area (AAA). These activities include the construction, expansion or operation; of any fixed radio frequency interference source, facilities for the generation, transmission or distribution of electricity, or any activity capable of causing radio frequency interference or which may detrimentally influence the astronomy and scientific endeavours.

In terms of section 7(1) and 7(2) of this Act, national government established the following AAAs:

- Central Karoo AAA (GN 198 of 2014) – proposed development falls outside this AAA
- Sutherland Central AAA – proposed development falls outside this AAA
- Northern Cape AAA (GN 115 of 2010) – proposed development falls outside of this AAA

Even though the proposed development falls outside the respective AAAs, the relevant authorities, including the Square Kilometre Array (SKA) and South African Large Telescope (SALT), will be consulted throughout the BA process.

11.14 National Energy Act (Act No. 34 of 2008)

South Africa has two (2) acts that direct the planning and development of the country's electricity sector, namely:

i. The National Energy Act of 2008 (Act No. 34 of 2008); and
ii. The Electricity Regulation Act (ERA) of 2006 (Act No. 4 of 2006).

The National Energy Act (Act No. 34 of 2008), promulgated in 2008, has, as one (1) of its key objectives, the promotion of diversity of supply of energy and its sources. From this standpoint, the Act directly references the importance of the renewable energy (RE) sector, with a mention of the solar energy sector included. The aim is to ensure that the South African economy is able to grow and develop, fast-tracking poverty alleviation, through the availability of a sustainable, diverse energy mix. Moreover, the goal is to provide for the increased generation and consumption of RE (Republic of South Africa, 2008).

11.15 Electricity Regulation Act (Act No. 4 of 2006)

In 2011, the electricity regulation on new generation capacity was published under Section 35(4) of the Electricity Regulation Act (ERA) (Act No. 4 of 2006). These regulations apply to the procurement of new generation capacity by organs of state.

The objectives of the regulations include:

- To facilitate planning for the establishment of new generation capacity;
- The regulation of entry by a buyer and a generator into a Power Purchase Agreement (PPA);
- To set minimum standards or requirements for PPAs;
- The facilitation of the full recovery by the buyer of all costs efficiently incurred by it under, or in connection with, a PPA including a reasonable return based on the risks assumed by the buyer thereunder and to ensure transparency and cost reflectivity in the determination of electricity tariffs; and
- The provision of a framework for implementation of an Independent Power Producer (IPP) procurement programme and the relevant agreements concluded.

The Act establishes a National Energy Regulator as the custodian and enforcer of the National Electricity Regulatory Framework. The Act also provides for licenses and registration as the manner in which generation, transmission, distribution, trading and the import and export of electricity are regulated.

11.16 Protection of Public Information Act (Act No. 4 of 2013)

The Protection of Public Information Act (Act No. 4 of 2013) (POPIA) recognises the Constitutional requirement that everyone has a right to privacy.

Ultimately the Act promotes “the protection of personal information processed by public and private bodies; to introduce certain conditions so as to establish minimum requirements for the processing of personal information; to provide for the establishment of an Information Regulator to exercise certain powers and to perform certain duties and functions in terms of this Act and the Promotion of Access to Information Act, 2000 (PAIA); to provide for the issuing of codes of conduct; to provide for the rights of persons regarding unsolicited electronic communications and automated decision making; to regulate the flow of personal information across the borders of the Republic; and to provide for matters connected therewith”.

Due to the requirements around the Public Participation Process, SIVEST will process and capture information aligned to the POPIA and always obtain consent for I&APs information to be gathered, stored and distributed for the purpose of this project.

11.17 Renewable Energy Development Zones (REDZs) and Strategic Transmission Corridors

The Strategic Environmental Assessment (SEA) for Wind and Solar PV Energy in South Africa (CSIR, 2015) originally identified eight (8) formally gazetted[2] Renewable Energy Development Zones (REDZs)

[2] Formally gazetted on 16 February 2018 (Government Notice 114)

that are of strategic importance for large-scale wind and solar PV development in terms of Strategic Integrated Project 8: Green Energy in Support of the South African Economy, as well as associated strategic transmission corridors3, including the rollout of its supporting transmission and distribution infrastructure, in terms of Strategic Integrated Project 10: Electricity Transmission and Distribution.

- REDZs for large-scale wind and solar photovoltaic development;
- associated Strategic Transmission Corridors which support areas where long-term electricity grid will be developed;
- process of basic assessment to be followed and reduced decision-making timeframe for processing of applications for environmental authorisation in terms of the NEMA; and
- acceptance of routes which have been pre-negotiated with all landowners as part of applications for environmental authorisations for power lines and substations.

In addition to the eight (8) formally gazetted REDZs mentioned above, the Phase 2 SEA for Wind and Solar Photovoltaic Energy in South Africa (2019) identified three (3) additional REDZs (namely REDZ 9, REDZ 10 and REDZ 11) that are of strategic importance for large scale wind and solar photovoltaic energy development. These REDZs were published under Government Notice No. 786, Government Gazette No. 43528 of 17 July of 2020, and were officially gazetted under Government Notice No. 144, Government Gazette No. 44191 of 26 February 2021[4].

Table 15: The SEA for Wind and Solar PV Energy in South Africa (Phase 1 and Phase 2) (CSIR, 2015; CSIR, 2019) identified the following eleven (11) geographic areas for REDZs

REDZ Number	Name	Applicability of REDZ
REDZ 1	Overberg	Large-scale wind and solar photovoltaic energy facilities
REDZ 2	Komsberg	Large-scale wind and solar photovoltaic energy facilities
REDZ 3	Cookhouse	Large-scale wind and solar photovoltaic energy facilities
REDZ 4	Stormberg	Large-scale wind and solar photovoltaic energy facilities
REDZ 5	Kimberley	Large-scale solar photovoltaic energy facilities
REDZ 6	Vryburg	Large-scale solar photovoltaic energy facilities
REDZ 7	Upington	Large-scale solar photovoltaic energy facilities
REDZ 8	Springbok	Large-scale wind and solar photovoltaic energy facilities
REDZ 9	Emalahieni	Large scale solar photovoltaic energy facilities
REDZ 10	Klerksdorp	Large scale solar photovoltaic energy facilities
REDZ 11	Beaufort West	Large scale wind and solar photovoltaic energy facilities

It should be noted that a portion of the proposed development is located within the Central Corridor of the Strategic Transmission Corridors, as defined and in terms of the procedures laid out in Government Gazette No. 41145 and No. 44191[5] Ultimately, the proposed development will still be subject to a BA process in terms of the NEMA, as amended, and the EIA Regulations, 2014 (as amended). A map of the development in relation to the nearest REDZ and Corridors has been included in **Appendix 2**.

[3] Formally gazetted on 16 February 2018 (Government Notice 113)

[4] Formally Gazetted on 26 February 2021 (Government Notice 144)

[5] Formally Gazetted on 26 February 2021 (Government Notice 145)

11.18 Additional Relevant Legislation

- White Paper on the Energy Policy of the Republic of South Africa (1998)
- Occupational Health and Safety Act (Act No. 85 of 1993) [OHSA];
- Environment Conservation Act (Act 73 of 1989) [ECA]
- Road Safety Act (Act No. 93 of 1996) [RSA];
- National Environmental Management: Air Quality Act (Act No. 39 of 2004) [NEM:AQA];
- National Environmental Management: Waste Act (Act No. 59 of 2008, as amended) [NEM;WA];
- Development Facilitation Act (Act No. 67 of 1995) [DFA];
- Promotion of Access to Information Act, (Act No. 2 of 2000); [PAIA]
- The Hazardous Substances Act (Act No. 15 of 1973) [HSA];
- Water Services Act (Act No. 108 of 1998) [WSA];
- Municipal Systems Act (Act No. 32 of 2000) [MSA];
- Subdivision of Agricultural Land Act, 70 of 1970 [SALA], and
- Mineral and Petroleum Resource Development Act (Act No. 28 of 2002, as amended) [MPRDA].

12. KEY DEVELOPMENT STRATEGIES AND GUIDELINES

In his 2021 State of the Nation Address, President Cyril Rhamaposa announced government are taking the following measures to rapidly and significantly increase generation capacity outside of Eskom:

- *One of the priority investment areas is to rapidly expand energy generation capacity.*
- *Restoring Eskom to operational and financial health and accelerating its restructuring process is central to achieving this objective. Eskom has been restructured into three separate entities for generation, transmission and distribution.*
- *A Section 34 Ministerial Determination will be issued shortly to give effect to the Integrated Resource Plan 2019, enabling the development of additional grid capacity from renewable energy, natural gas, hydro power, battery storage and coal.*
- *We will initiate the procurement of emergency power from projects that can deliver electricity into the grid within 3 to 12 months from approval.*
- *The Department of Mineral Resources and Energy gazetted the Amended Schedule 2 of the Electricity Regulation Act 4 of 2006 on 12 August 2021, for 100 Megawatts of embedded electricity generation as approved by Minister Gwede Mantashe.*
- *We will negotiate supplementary power purchase agreements to acquire additional capacity from existing wind and solar plants.*
- *We will also put in place measures to enable municipalities in good financial standing to procure their own power from independent power producers.*

Policy decisions taken in the next decade will largely determine the dimension of the impact of climate change. Local government is in the front line of implementation and service delivery, and thus needs to pursue adequate mitigation and adaptation strategies which should include participation from the public sector, the private sector and NGOs.

The DoE gazetted its White Paper on Renewable Energy in 2003 and introduced it as a ‘policy that envisages a range of measures to bring about integration of renewable energies into the mainstream energy economy.’ At that time, the national target was fixed at 10 000GWh (0.8Mtoe) renewable energy contribution to final energy consumption by 2013. The White Paper proposed that this would be

produced mainly from biomass, wind, solar and small-scale hydropower. It went on to recommend that this renewable energy should be utilised for power generation and non-electric technologies such as solar water heating and biofuels. Since the White Paper was gazetted, South Africa's primary and secondary energy requirements have remained heavily fossil-fuel dependent, both in terms of indigenous coal production and use, as well as the use of imported oil resources. Alongside this, the projected electricity demand of the country has led the National utility Eskom, to embark upon an intensive build programme to secure South Africa's longer-term energy needs, together with an adequate reserve margin.

The National Development Plan (NDP), 2011 – 2030, aims to address parts of the South African triple development challenges of poverty and inequality by 2030. In order to achieve this, numerous enabling milestones and critical actions have been formulated. One (1) of the critical actions is the formulation and implementation of interventions that aim to ensure environmental sustainability and resilience to future shocks.

The emphasis is on South African investment and assistance in the exploitation of various opportunities for low-carbon energy in the clean energy sources of Southern Africa (National Planning Commission, 2011).
A more efficient and competitive infrastructure is envisaged, particularly infrastructure that facilitates economic activity and is conducive to growth and job creation. The plan identifies key services that need strengthening; namely commercial transport, energy, telecommunications and water, while ensuring their long-term affordability and sustainability. The National Planning Commission maintains that South Africa has missed a generation of capital investment in many infrastructure opportunities including electricity. Therefore, one (1) infrastructure investment priority is in the procurement of at least 20000MW of renewable energy-efficiency (National Planning Commission, 2011).

The proposed project is thus well aligned with the aims of the NDP which is further detailed in the following national and provincial plans:

- National Integrated Resource Plan for Electricity (2010-2030);
- Integrated Resource Plan (IRP 2019)
- National Infrastructure Plan 2012, as amended;
- Western Cape Strategic Plan 2019-2024
- The Western Cape Spatial Development Framework (SDF) 2014
- Central Karoo District Municipality Integrated Development Plan, 2020 – 2021

The proposed project is also well aligned with the Prince Albert Municipality IDP and the Beaufort West Local Municipality IDP discussed further below.

12.1 Western Cape Strategic Plan 2019 - 2024

The Western Cape Strategic Plan 2019-2024, highlights the need for energy security and for diversification of the regional energy mix, emphasizing support for the Green Economy and stating that.

"*The growth of the renewable energy sector has the potential for high labour absorption and can also link to increased opportunities for SMMEs, especially for SSEG*" (Western Cape Government, 2020, p. 48).

12.2 The Western Cape Spatial Development Framework (SDF) 2014

The proposed project falls within the Western Cape Province. According to the Western Cape Spatial Development Framework (SDF), the Western Cape's energy sources are mostly drawn from the national grid which is dominated by non-renewable sources. According to the SDF, the Province has a small emergent sustainable energy sector in the form of wind and solar generation facilities located in the more rural, sparsely populated areas. One of the key transitions in terms of the Western Cape Infrastructure Framework is to "*Promote the development of renewable energy plants in the Province and associated manufacturing capability*".

The SDF also mentions the challenges around Climate Change and that the focus areas for mitigation are energy efficiency, demand management and renewable energy. Through climate change mitigation they hope to "*encourage and support renewable energy generation at scale*".

The Western Cape Strategic Plan 2019-2024, also highlights the need for energy security and for diversification of the regional energy mix, emphasising support for the Green Economy and stating that: "*The growth of the renewable energy sector has the potential for high labour absorption and can also link to increased opportunities for SMMEs, especially for SSEG*" (Western Cape Government, 2020, p. 48).

12.3 Central Karoo District Municipality Integrated Development Plan, 2020 – 2021

The Central Karoo DM has identified the "potential and impact of renewable energy resource generation, as part of the district's economic profile (Central Karoo District Municipality, 2019, pp. 16, 79, 80 & 81)

The Municipality indicates that it will move to less carbon-intensive electricity production through procuring at least 20 000MW of renewable energy by 2030, increased hydro-imports from the region and increased demand-side measures, including solar water heating.

The IDP further mentions that the introduction of renewable energy generation and the Square Kilometer Array project in the greater Karoo region, as well as possible exploration for shale gas, will add value to the Gross Domestic Product (GDP) within certain economic sectors and, by implication, change the composition and character of the towns. Further suggestions are at developing an Alternative Energy Strategy for the Central Karoo.

12.4 Prince Albert Municipality Integrated Development Plan (2020/21 Draft Review)

With Eskom struggling to provide in all energy demands, the Municipality is in the process of exploring alternate energy sources for Commercial, Residential and Industrial use. This will have a direct impact on the Municipality's income and will need to be undertaken with careful consultations and input from the local communities.

In terms of access to electricity, the Prince Albert Municipality also mentions that it will investigate the possibility of renewable energy and the inclusion of Small-Scale Embedded Generation (SSEG) onto the electricity distribution network so that "*safety, power quality, grid operation and municipal revenue issues are adequately addressed, and that the local renewable energy industry and green economy is promoted at the same time, supporting job creation*".

The Prince Albert Local Municipality recognises that the area has " …*vast land, long Karoo sunshine days and high quality of sunrays inspires the development of solar parks* (Prince Albert Municipality, 2018, p. 123). Although not specifically mentioned in the IDP, the potential to expand this resource to encompass wind energy is likely to be a viable option.

12.5 Beaufort West Local Municipality Integrated Development Plan (2013 – 2016)

The Municipality has a responsibility to take care of the natural environment for future generations to enjoy a clean and safe environment, in which biodiversity is conserved and tourism is maximised. The Beaufort West Integrated Development Plan 2018/19 Review therefore lists Clean Energy as its Sustainable Development Goal 7 (Beaufort West District Municipality, 2018, p. 20 & 21).

The IDP indicates that natural resources should be used more efficiently and investment in green technologies pursued in order to ensure that there is enough water and energy for the growing economy. The Municipality needs to be more robust and resilient so that it can respond to the challenges of climate change and other natural hazards.

In terms of major infrastructure projects planned for the municipality, they also hope to "*Promote domestic and large wind and solar energy projects subject to appropriate guidelines and siting principles*".

13. NEED AND DESIRABILITY

13.1 National Renewable Energy Requirement

In 2010, South Africa had 44,157MW of power generation capacity installed. Current forecasts indicate that by 2025, the expected growth in demand will require the current installed power generation capacity to be almost doubled to approximately 74,000MW (SAWEA, 2010).

This growing demand, fuelled by increasing economic growth and social development within Southern Africa, is placing increasing pressure on South Africa's existing power generation capacity. Coupled with this, is the growing awareness of environmental impact, climate change and the need for sustainable development. Despite the worldwide concern regarding Greenhouse Gas (GHG) emissions and climate change, South Africa continues to rely heavily on coal as its primary source of energy, while most of the countries renewable energy resources remain largely untapped (DME, 2003). There is therefore an increasing need to establish a new source of generating power in SA within the next decade.

The use of renewable energy technologies, as one (1) 10 of a mix of technologies needed to meet future energy consumption requirements is being investigated as part of Eskom's long-term strategic planning and research process. It must be remembered that wind energy is plentiful, renewable, widely distributed, clean and reduces GHG emissions when it displaces fossil-fuel derived from electricity. In this light, renewable wind energy can be seen as desirable.

The REIPPP programme and the competitive nature of the bidding process has resulted in significant lowering of solar and wind tariff prices since 2011. Further projects will increase the competitive nature of the REIPPP program and further result in cost savings to South African consumers.

13.2 National Renewable Energy Commitment

In support of the need to find solutions for the current electricity shortages, the increasing demand for energy, as well as the need to find more sustainable and environmentally friendly energy resources, South Africa has embarked on an infrastructure growth programme supported by various government initiatives. These include the National Development Plan (NDP), the Presidential Infrastructure Coordinating Commission (PICC), the DoE's IRP, the National Strategy for Sustainable Development, the National Climate Change Response White Paper, the Presidency of the Republic of South Africa's Medium-Term Framework, and the National Treasury's Carbon Tax Policy Paper.

The Government's commitment to growing the renewable energy industry in South Africa is also supported by the White Paper on Renewable Energy (2003) which sets out the Government's principals, goals and objectives for promoting and implementing renewable energy in South Africa. In order to achieve the long term goal of achieving a sustainable renewable energy industry, the DoE has set a target of contributing 17,8GW of renewable energy to the final energy consumption by 2030. This target is to be produced mainly through, wind and solar; but also through biomass and small scale hydro (DME, 2003; IRP, 2010). Further renewable energy targets have been proposed within the latest IRP, which was gazetted in 2019.

The 2019 Integrated Resource Plan (2019) (IRP2019) was released on 18 October 2019 and includes the following capacity allocation:

- 1 500 MW of new coal power (noting that there will be decommissioning of coal capacity over the period);
- 2 50 0MW of hydro power;
- 6 000 MW solar;
- 14 400 MW wind;
- 2 000 MW of storage;
- 3 000 MW from gas.

13.3 Wind Power Potential in South Africa and Internationally

Onshore wind energy technology is the most commonly used and commercially developed renewable energy technology in South Africa as wind is abundant and inexhaustible (DEA Guideline for Renewable Energy, 2015). Wind energy is one (1) of the lowest-priced renewable energy sources and is economically competitive (www.wasaproject.info).

13.4 Site Suitability

The proposed substation and power line development will serve the Koup 1 WEF and once fully developed, the intention is to feed the electricity generated by the above-mentioned WEF project into the national grid.

The location of the proposed on-site Switching / Collector Substation and associated 132kV Power Line development (this application) that will serve the Koup 1 WEF (part of separate respective EIA process). included several key aspects including wind resource, grid connection suitability as well as environmental, competition, topography and access.

1. Wind resource is the first of the main drivers of project viability across South Africa.

2. Environmental suitability is the second key aspect that the Applicant considers when evaluating a wind energy project. The project should be developed in a sustainable and ecologically friendly manner ensuring its development has the least possible impact on the land on which it will be built.

   While the smaller drainage features of the site are classified as Ecological Support Areas, there is only one small area of CBA in the east of the site that would be minimally impacted by the development.

3. The third primary driver of site selection is capacity on the local transmission system to evacuate the power into the national grid. In this case, the applicant is in discussions with Eskom with regards to a Collector Substation that is envisaged. One scenario includes a Collector at the Koup 1 SS footprint. Should Eskom decide to place the Collector SS on the windfarm to the north or to the south; lines will run from Koup 1 on-site SS to the Collector. The Collector will then link into the 400kV line.

4. Other key criteria which refines the site selection on a micro level include competition, topography and access.

13.5 Reduce dependency on fossil fuels

At present, more than 90% of South Africa's energy is generated by coal-fired power stations. Apart from the fact that these are finite resources that will eventually run out, fossil fuels are also harmful to the environment when used to produce electricity. During combustion, fossil fuels such as coal emit many by-products into the atmosphere, two (2) of which are carbon dioxide (CO_2) and sulphur dioxide (SO_2). Both these gases have been shown to contribute to the worsening climate crisis. Wind is a free and infinite resource that occurs naturally in the environment. Converting wind energy into electricity releases no harmful by-products into the environment and will reduce the dependency on fossil fuels.

13.6 Stimulate the economy

A significant portion of the capital expenditure envisaged for the project will be spent on procurement of goods and services within South Africa and specifically within the Western Cape Province. If goods and services are procured locally (i.e. within South Africa), it increases the production of the respective industries. This has a positive impact on the national economy and economies of the municipalities where inputs are procured.

The proposed development has the potential to stimulate the demand for other industries, among others construction services, engineering service, transport services, steel structures, cement and other aggregates, and electrical equipment. At the local level, increase in demand for accommodation, personal services, perishable and non-perishable goods is expected, which will stimulate the local economies of the towns and settlements, where labour will be procured from or where migrant workers will be temporarily located.

Some of the local businesses could benefit from sub-contracting opportunities, if the construction companies appointed by the developer implement a local community procurement policy, and consumer expenditure of the construction crew. Furthermore, the demand for hospitality services (including accommodation and catering in the towns Beaufort West and other nearby towns) is expected to increase and provide for much-needed stimulus for the local economy.

According to the Social Impact Assessment, *apart from jobs the project is also likely to stimulate the local economy, which is likely to be most significant at a cumulative level. Nevertheless, there will be a significant economic contribution attached to the Genesis Enertrag Koup 1 Wind Facility. This contribution will be in the form of disposable salaries and the purchases of services and supplies from the local communities in and around the towns of Beaufort West and Prince Albert. The capital expenditure on completion of the project is anticipated to be in the region of R 2.5 billion.*

Apart from job creation and procurement spend; the project will also have broader positive socio-economic impacts as far as socio-economic development contributions are concerned. Although, at the point of writing, the project developer had not as yet put a corporate social responsibility plan in place, the intention is to either fall in line with the REIPPP BID guidelines or to put an equivalent plan in place. This will create an opportunity to support the local community over the life span of the operational phase of the project, which will stretch over a 20-year period. At a national level the project also has the potential to contribute towards the national grid requirements as part of the Government's *vision to source 15.1% of the country's energy through wind power (Department of Energy Republic of South Africa, 2018, p. 41).*

13.7 Job opportunities and household livelihoods

Wind energy projects create both temporary and permanent job opportunities in South Africa for both skilled and unskilled workers. According to the Social Impact Assessment that was undertaken (May 2021), t*he project will lead to the creation of both direct and indirect jobs which will have a positive economic benefit within the region. In this regard, there are 300-400 jobs associated with the construction phase of the project and 20 with the operational phase. Of these jobs approximately 165-220 (55%) of the employment opportunities will be available to low-skilled workers (construction labourers, security staff etc.), 90-120 (30%) to semi-skilled workers (drivers, equipment operators etc.), and 45-60 (15%) for skilled personnel (engineers, land surveyors, project managers etc.). Many of the low and semi-skilled employment opportunities will probably be available to residents in the area, specifically residents from Beaufort West and Prince Albert. Many of the beneficiaries are likely to be historically disadvantaged members of the community and the project will provide opportunities to develop skills amongst these people. The operational phase will employ approximately 20 people full time for a period of up to 20 years. Of this, approximately 4 are low skilled, 10 are semi-skilled and 6 are skilled.*

In addition to those benefitting from direct employment created at the project, various multiplier effects will assist in temporarily supporting existing jobs in the businesses offering services and goods that will be procured during construction activities. The increased temporary income earned by these businesses will, in turn, stimulate consumer spending, creating another round of multiplier effect, positively impacting on the employment situation in the area.

Household earnings are linked closely with trends in employment and, as such, will be affected positively by the creation of jobs as discussed above. The creation of temporary jobs during the construction period will temporarily increase affected households' income. Some of this income will be earned by workers from the local communities. Given that the average household income in the area is R29 400, a significant boost in household income may prevail. A temporary increase in living standards based on the additional monthly income will thus ensue. Employees working for local businesses that will be sub-contracted to supply goods and services to the WEF and Grid during construction are also expected to benefit indirectly.

13.8 Skills development

In addition to the job creation, there is valuable opportunities for skills enhancement and knowledge transfer as quite often input from experts are required in this field. Therefore, opportunities for guiding and training of local workers is created. A variation of skill sets is required ranging from semi-skilled construction workers to highly skilled engineers. The skill set of the majority of the municipality's residents comprises of low-skills, which means that with proper planning and recruitment strategies, many of the local unemployed residents could be hired as temporary construction workers on site provided they satisfy any other recruitment criteria.

Those employed will either develop new skills or enhance current skills. This insinuates that inexperienced workers will have the opportunity to attain and develop new skills, while experienced workers will further improve their existing skills. Albeit the employment is temporary, the skills attained will be of long-term benefit to employees. However, as any skills set it will need to be supported and practised on a regular basis to maintain its currency.

13.9 Proximity to substation

The area is well situated, as described above, with good wind resources suitable for the installation of a large WEF. In addition to this, the project area is in close proximity to connectivity opportunities. The surrounding area is not densely populated and should therefore not impact on people's livelihoods living in the area.

Grid connection suitability, or capacity on the local transmission system to evacuate the power into the municipal electricity grid, is one of the primary drivers which assists in choosing the project location. Long connection lines have increased environmental impacts as well as add increased costs to the proposed development. The proposed development site has good grid connection potential and this thereby minimises the need for an extensive grid network upgrade or long power line.

14. DETAILS OF PROCESS FOLLOWED TO REACH THE PREFERRED OPTION

14.1 Details of alternatives

14.1.1 Introduction

As per the 2014 EIA Regulations (as amended), feasible and reasonable alternatives are required to be considered during the BA process. Alternatives are defined in Chapter 1 of the 2014 EIA Regulations (as amended) as "different means of meeting the general purpose and requirements of the activity". These alternatives may include:

(a) The property on which or location where it is proposed to undertake the activity;
(b) The type of activity to be undertaken;
(c) The design or layout of the activity;
(d) The technology to be used in the activity;
(e) The operational aspects of the activity; and
(f) The option of not implementing the activity.

Each of the alternatives in relation to the proposed development is discussed in the sections below.

14.1.2 Location/Site alternatives

There are several factors which are favourable for the placement of WEFs, power lines and substations at the proposed site location. This included land availability and topography, environmental sensitivities, distance to the national grid, wind resource, site accessibility and current land use. The project site for the WEF, power lines and substation has been identified based on wind resource, grid connection suitability, competition, topography, land availability and site access.

Only two site alternatives for the proposed development are being considered as the placement of the proposed substation is dependent on the location of the proposed Koup 1 WEF.

Substation

Two (2) substation site alternatives are being considered and comparatively assessed by the EAP and specialists as follows:

3. ***Substation Site Alternative 1:*** is located within close proximity to the site access point for the proposed Koup 1 WEF on Portion 11 of the Farm Brits Eigendom No. 374 (part of separate application), and is approximately 2.3km west of the N12 National Road; and
4. ***Substation Site Alternative 2:*** is located within close proximity to the site access point for the proposed Koup 1 WEF on Portion 11 of the Farm Brits Eigendom No. 374 (part of separate application), and is approximately 3.1km west of the N12 National Road.

14.1.3 Activity/technology alternatives

Activity alternatives refer to the consideration of alternatives requiring a change in the nature of the proposed activity to be undertaken.

No other activity / technology alternatives are being considered. Renewable energy development in South Africa is highly desirable from a social, environmental and development point of view. Based on the terrain, the climatic conditions and current land use being agricultural, it was determined that the proposed site would be best-suited for a substation and powerline associated with WEF, instead of any other type of renewable energy technology. It is generally preferred to install wind energy facilities (WEFs) on elevated ground. There is also not enough rainfall in the area to justify a hydro-electric plant. Therefore, the only feasible technology alternative on this site is WEF with associated infrastructure and as such this is the only technology alternative being considered.

One (1) type of activity is therefore considered (namely 132kV overhead power line and on-site switching substation and/or combined collector substation) in order to feed the electricity / energy generated from a renewable source of energy, wind energy (namely the Koup 1 WEF), into the national electricity grid.

14.1.4 Design or Layout alternatives

Layout alternatives have been considered and assessed as part of the BA process. The alternatives which have been considered and assessed as part of the grid connection infrastructure application include two (2) substation site alternatives (as discussed above) and three (3) power line corridor route alignment alternatives (**Figure 34**). All alternatives have been comparatively assessed by the respective

specialists and assessed against the 'no-go' alternative (i.e. status quo). The various alternatives are described below:

Power Line Corridor

Three (3) power line corridor route alignments are being considered and have been comparatively assessed by the EAP and specialists within a 300m wide assessment corridor (150m on either side of power line) as follows:

4. ***Power* Line Corridor Option 1:** is approximately 1.3km in length, linking either substation / collector Option 1 or Option 2 (see above) to the existing 400kV transmission lines;
5. ***Power* Line Corridor Option 2:** is approximately 9.9km in length, linking either substation / collector Option 1 or Option 2 (see above) to a proposed Collector Substation to the south, adjacent to the existing 400kV transmission lines; and
6. ***Power* Line Corridor Option 3:** is approximately 12.9km in length, linking either substation / collector Option 1 or Option 2 (see above) to a proposed Collector Substation to the north, adjacent to the existing 400kV transmission lines.

Power line corridors are being assessed to allow flexibility when determining the final route alignment. As mentioned, the power line corridors which are being assessed are up to approximately 300m wide (150m on either side of power line) to allow for flexibility to route the power line within the assessed corridor. Based on the specialist assessments, a few potentially sensitive and/or 'no-go' areas have been identified within the application site. These areas were used to inform the development area for the substation within the application site as well as the routing of the power line corridors. The identified sensitive / 'no-go' areas were also used to perform a comparison of substation site alternatives and the route alternatives. The substation site alternatives and power line route alternatives and results of the comparative assessment of alternatives have been discussed in more detail below.

14.1.5 No – go option

The 'no-go' alternative is the option of not undertaking the proposed grid connection infrastructure project. Hence, if the 'no-go' option is implemented, there would be no development. This alternative would result in no environmental impacts from the proposed project on the site or surrounding local area. It provides the baseline against which other alternatives are compared and will be considered throughout the BA process.

The option of not implementing the activity, or the "no-go" alternative, has been considered in this BA process. South Africa is under immense pressure to provide clean sources of electricity generating capacity in order to reduce the current electricity demand from aging and polluting coal-fired power stations. With the global focus on climate change, the government is under severe pressure to explore alternative energy sources in addition to coal-fired power stations. Although wind energy is not the only solution to solving the energy crisis in South Africa, not establishing the proposed WEF and associated infrastructure would be detrimental to the mandate that the government has set to promote the implementation of renewable energy. It is a suitable sustainable solution to the energy crisis and this project could contribute to addressing the problem. This project will thus aid in achieving South Africa's goals in terms of sustainability, energy security, mitigating energy cost risks, local economic development and national job creation.

The no-go alternative will result in the current status quo being maintained as far as the avifauna, bats and the aquatic systems are concerned. The low human population in the area is definitely advantageous to sensitive avifauna, especially Red Data species. The no-go option would therefore eliminate any additional impact on the ecological integrity of the proposed development site.

With regard to heritage resources, even without development, fossils will still be destroyed by natural weathering and erosion. In the case of the No-Go Alternative the possible loss of local heritage resources through construction activities would be avoided, however potential improvements in palaeontological understanding through professional mitigation - i.e. recording and collection of palaeontological material and data would be lost. The slow destruction of fossils exposed at the surface through natural weathering and erosion would continue, but at the same time new fossils are revealed for scientific study. On balance, it is concluded that no-go alternative would have a neutral impact on palaeontological heritage.

The no-go option would also mean that the social environment is not affected as the status quo remains. On a negative basis, it also means that all the positive aspects associated with the project would not materialise. Consequently, there would be no job creation, no revenue streams into the local economy and municipal coffers, and a lost opportunity to enhance the National Grid with a renewable source of energy. Considering that Eskom's coal-fired power stations are a huge contributor to carbon emissions, the loss of a chance to supplement the National Grid through renewable energy would be significant at a national, if not at a global level. According to the Social Impact Assessment (May 2021), the Intergovernmental Panel on Climate Change (6 October 2018, p. 15) has warned that the Co2 emissions need to be reduced by 45% from the 2010 levels by 2030 and to zero by 2050, which means that coal must go in the immediate future.

The area would also retain its visual character and sense of place and no visual impacts would be experienced by any locally occurring receptors. The above-mentioned alternatives (including 'no-go' alternative) were all assessed by the appointed specialists as part of the BA process (this application). All the above-mentioned substation site and power line corridor route alternatives were informed by the identified environmental sensitive and/or 'no-go' areas (i.e. status quo). The respective alternatives which were considered as part of the BA process for the proposed development were also comparatively assessed.

14.1.6 Comparative Assessment of Alternatives

The proposed substation site alternatives and power line route alternatives which were investigated and comparatively assessed as part of the BA process are shown in **Figure 34** below.

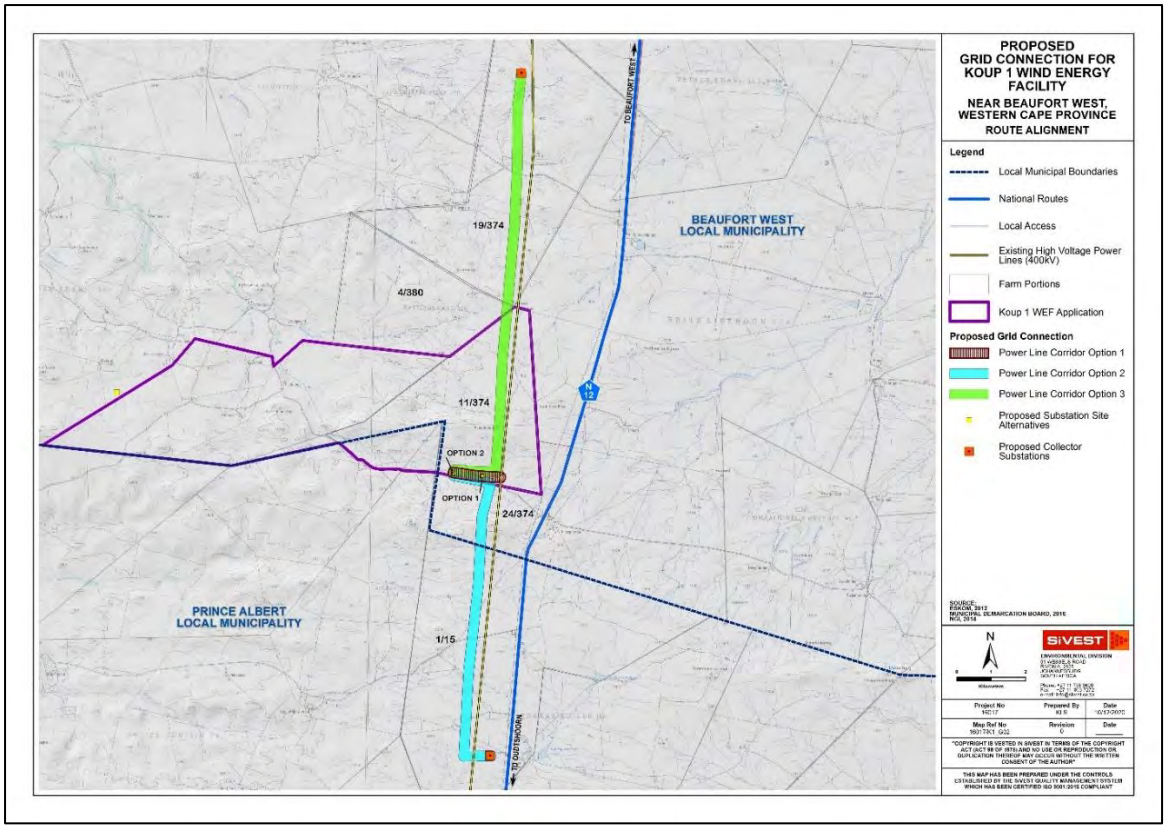


Figure 34: Preliminary Layout

Each of the alternatives have been comparatively assessed in terms of the findings from the specialist assessments conducted as part of the BA process and is summarised in the table below.

Key

PREFERRED	The alternative will result in a low impact / reduce the impact
FAVOURABLE	The impact will be relatively insignificant
NOT PREFERRED	The alternative will result in a high impact / increase the impact
NO PREFERENCE	The alternative will result in equal impacts

Table 16: Summary of comparative assessment of substation site alternatives for Substation

ALTERNATIVE	ENVIRONMENTAL ASPECT													FATAL FLAW (YES / NO)	PREFERRED (YES / NO)
	Agric. and Soils	Avifauna	Bat	Terrestrial Ecology	Geotech	Archaeo	Palaeo	Cultural	Noise	Social	Surface Water	Transportation	Visual		
SUBSTATION SITE ALTERNATIVES															
Option 1	Not assessed	No Preference	Preferred	Preferred	No Preference	No Preference	No preference	Favourable	No preference	No preference	Preferred	No preference	Favourable	NO	YES
Option 2	Not assessed	No Preference	Least Preferred	Favourable	No Preference	No Preference	No preference	Least preferred	No preference	Least preferred	Favourable	No preference	Favourable	NO	NO

Table 17: Summary of comparative assessment of construction laydown area

ALTERNATIVE	ENVIRONMENTAL ASPECT													FATAL FLAW (YES / NO)	PREFERRED (YES / NO)
	Agric. and Soils	Avifauna	Bat	Terrestrial Ecology	Geotech	Archaeo	Palaeo	Cultural	Noise	Social	Surface Water	Transportation	Visual		
CONSTRUCTION LAYDOWN AREA SITE ALTERNATIVES															
Option 1	Not assessed	No Preference	Preferred	Preferred	No Preference	No Preference	No preference	Favourable	No preference	No preference	No preference	No preference	Favourable	**NO**	**YES**
Option 2	Not assessed	No Preference	Least Preferred	Least Preferred	No Preference	No Preference	No preference	Least Preferred	No preference	Least preferred	No preference	No preference	Favourable	**NO**	**NO**

Table 18: Summary of comparative assessment of power line corridors

ALTERNATIVE	ENVIRONMENTAL ASPECT													FATAL FLAW (YES / NO)	PREFERRED (YES / NO)
	Agric. and Soils	Avifauna	Bat	Terrestrial Ecology	Geotech	Archaeo	Palaeo	Cultural	Noise	Social	Surface Water	Transportation	Visual		
POWER LINE CORRIDOR ROUTE ALTERNATIVES															
Option 1 A/B	Not assessed	Preferred	Not assessed	Preferred	No Preference	No Preference	Preferred	Favourable	Not assessed	Favourable	Preferred	Not assessed	Preferred	**NO**	**YES**
Option 2 A/B	Not assessed	Favourable	Not assessed	Favourable	No Preference	No Preference	Least Preferred	Least Preferred	Not assessed	Least Preferred	Preferred	Not assessed	Favourable	**NO**	**NO**
Option 3 A/B	Not assessed	Least Preferred	Not assessed	Least Preferred	No Preference	No Preference	Least Preferred	Least Preferred	Not assessed	Least Preferred	Preferred	Not assessed	Favourable	**NO**	**NO**

14.2 Motivation and concluding statement for preferred alternative

No activity alternatives are being considered. Renewable Energy development in South Africa is highly desirable from a social, environmental and development point of view. Wind energy installations are more suitable for the site because of the high wind resource. The choice of technology selected for the Koup 1 WEF and grid was based on environmental constraints and technical and economic considerations.

The site locations have been based on proximity to the WEF and the preliminary layout (and options) have been assessed by the specialists in their respective specialist studies. All specialists sensitivities have been taken into consideration when determining the preferred option to take forward for approval.

Based on the results of the comparative assessment of substation site alternatives and the construction laydown area options, the substation Option 1 and construction laydown area Option 1 is preferred. However, both are deemed acceptable for authorisation since none are fatally flawed. It is therefore requested that **Substation Option 1** and **Construction Laydown Area Option 1 be authorised** as part of the proposed development since this is the preferred option (should the EA be granted). While the cultural specialist identified Substation Option 1 and Construction Laydown Option 1 as favorable, the specialist stated that this infrastructure should be located on the same side of the road and outside of the 300m farm road buffer. This is currently not the case as evident in the layout. The location of the Substation and Construction laydown areas are constrained by a number of sensitivities as well as riverine habitat and the most feasible lcoation has been selected.

In terms of the powerline options, powerline Option 1 has been ruled out as an unfeasible option as Eskom will not permit two collectors within a small radius. Similarly, powerline Option 3 has also been ruled out as an unfeasible option as a result of the bird nests on powerline tower 108 and the 2.5 km no development buffer. Therefore, the only feasible option is powerline Option 2.

The results of the comparative assessment undertaken by the specialists for the power line alternatives resulted in power line Option 1 as the most preferred from a biophysical point of view as it is the shortest option, followed by Option 2. Option 3 was the least preferred. The heritage specialists (CLA specialist and PIA specialist) identified Options 2 and 3 being their least preferred as these options will increase the clutter and degradation of the rural cultural landscape along the N12 scenic route. Powerline Option 2 is however located outside of the 1 km buffer that the cultural specialist recommended (the powerline is between 1.2km and 1.5km away from the N12). The infrastructure that is within the 1 km buffer is the collector substation which is located approximately 600m away from the N12. The social specialists also identified Options 2 and 3 as being the least preferred, as a result of the heritage findings.

There are however already powerlines and wind farms in this area. The majority of powerline Option 2 runs adjacent to existing 400kV power lines and as such this section of the route alignment has already undergone a degree of transformation from its natural state (refer **Figure 35** below showing general location of powerline Option 2/collector substation, showing multiple powerlines). This would lessen the impacts of the new power line in this area. Furthermore, the visibility analysis undertaken by the visual specialist identified only a small portion of which most sections of the powerline would be visible to motorists travelling on the N12 (refer **Figure 36** below).

Based on the information presented above, the **applicant has opted for powerline Option 2 to be authorised** (should EA be granted). The preferred alternatives, including maps, is further presented in the **Figures** below as well as in **Appendix 3.** The selected preferred substation site alternative and power line route alternative has been based on both environmental constraints and design factors.

Figure 35: Google Earth image of the general vicinity of Grid Option 2 and collector substation with existing powerline in the background.

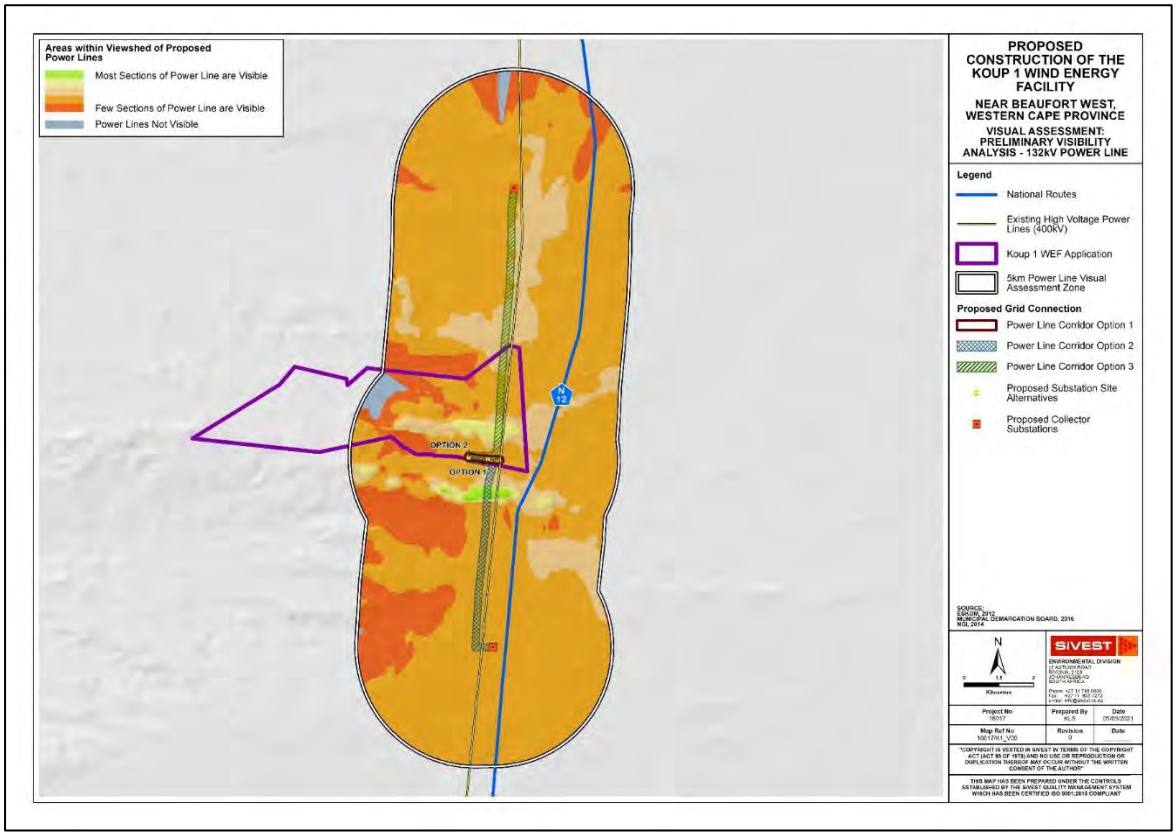


Figure 36: Potential visibility of powerlines

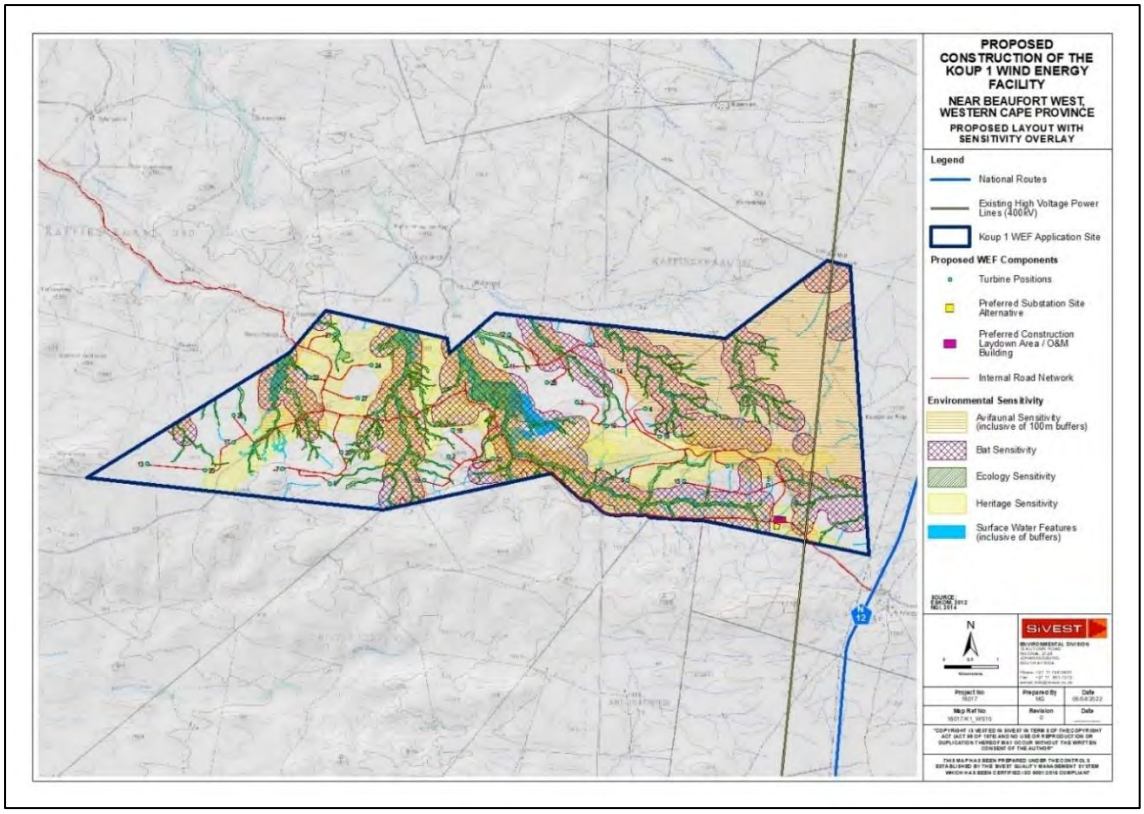


Figure 37: Location of preferred substation alternative with sensitivities as seen on the WEF sensitivity layout

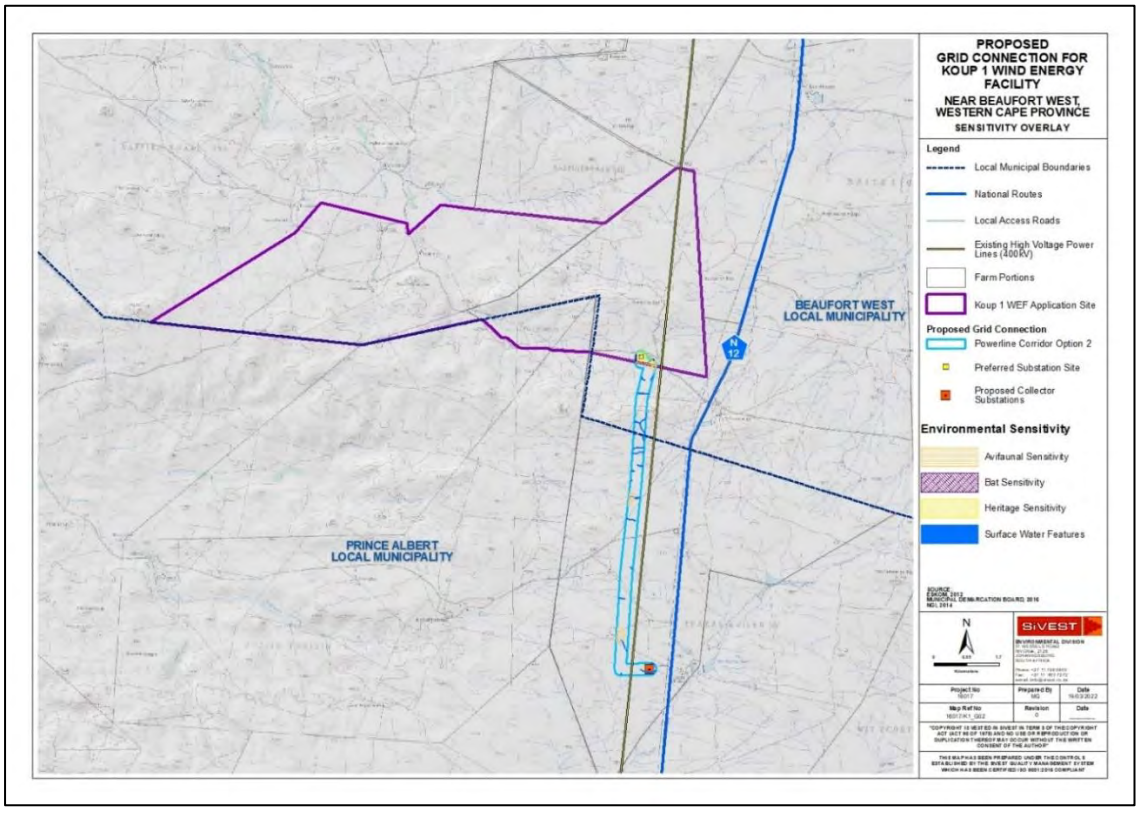


Figure 38: Sensitivity mapping of preferred alternative

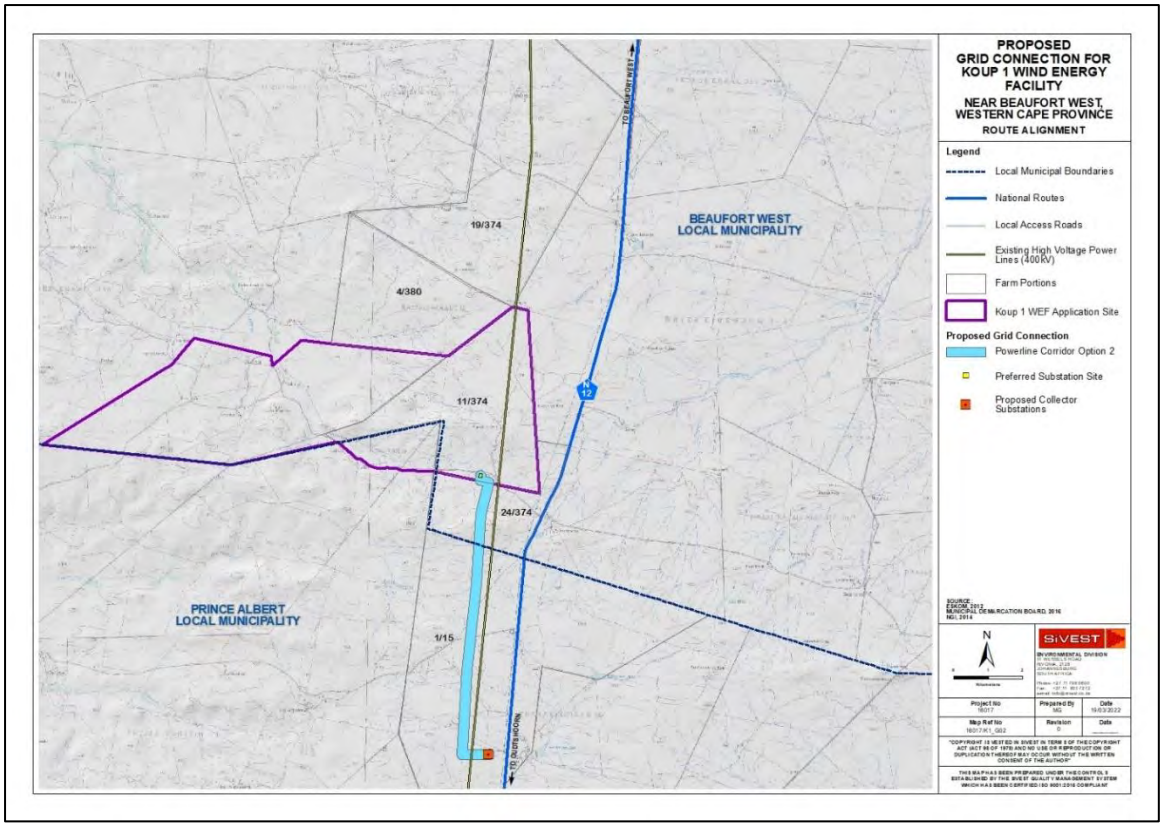


Figure 39: Preferred layout being put forward for approval

14.3 Public Participation Process undertaken

Public participation is the cornerstone of any EIA. The principles of the National Environmental Management Act (NEMA) as well as the EIA Regulations (as amended 2017) govern the EIA process, including public participation. These include provision of sufficient and transparent information on an ongoing basis to stakeholders to allow them to comment, and ensuring the participation of previously disadvantaged people, women and the youth. All documents relating to the PP process have been included in **Appendix 5**.

The aim of the Basic Assessment Process is to collect the issues, concerns and queries of interested and affected parties (I&APs). The main objective is to:

- Inform the stakeholders about the proposed project and the environmental assessment process to be followed;
- Provide opportunity to all parties to exchange information and express their views and concerns;
- Obtain contributions from stakeholders (including the client, consultants, relevant authorities and the public) and ensure that all issues, concerns and queries raised are fully documented;
- Evaluate the issues raised and identify the significant issues; and
- Provide comment on how these issues are to be assessed as part of the Environmental Assessment Process.

14.3.1 Identification of Key Stakeholder and I&AP's

Liaison with the relevant authorities plays a crucial role in the successful completion of any environmental assessment process. In addition to the competent authority, DFFE, key stakeholders, the local municipality as well as other potentially affected I&APs, including adjacent property owners and dwellers, are identified.

The following key stakeholders were identified for this project:

- Agri SA;
- ATNS – Cape Town International Airport;
- Birdlife South Africa;
- Breede Valley Local Municipality;
- Cape Nature;
- Central Karoo District Municipality;
- Department of Agriculture;
- Department of Environmental Affairs;
- Department of Public Works;
- Department of Transport and Public Works WC
- Eskom Transmission Limited;
- Heritage Western Cape;
- Prince Albert Municipality
- SALT – The Southern African Large Telescope;
- South African Weather Services;
- South African Astronomical Observatory;
- Telkom SA;
- WESSA;
- Air Traffic Navigation Services;
- Beaufort West Local Municipality;
- Breede Gouritz Catchment Management Agency;
- BVM Municipality;
- DAFF Provincial Department;
- Department of Environmental Affairs and Development Planning;
- Department of Mineral Resources;
- Department of Transport;
- Department of Water and Sanitation;
- EWT;
- National Department of Economic Development;
- SA Civil Aviation Authority;
- SANRAL
- Sentech;
- Square Kilometre Array
- Transnet;
- Western Cape Provincial Government;

This list will be updated as the project progresses and based on responses received.

14.3.2 Responsibilities of interested and affected parties (I&AP's)

Members of the public who want to participate in the assessment process need to register and are referred as I&AP's. Registered I&AP's are entitled to comment, in writing, on all written submissions to the authority and to raise any issues that they believe may be significant, provided that:

- Comments are submitted within the timeframes set by the competent authority or extensions of timeframes agreed to by the applicant, Environmental Assessment Practitioner (EAP) and competent authority.
- A copy of the comments submitted directly to the competent authority is served on the applicant or EAP.
- The I&AP discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.

14.3.3 Steps taken to notify key stakeholders and potential I&Aps

Notification of BA process to be undertaken as follows:

- Issuing of the notifications and initial landowner consultation (to be circulated to all I&APs in April 2022 respectively as part of the Draft Basic Assessment Report (proof to be included in Final Basic Assessment Report).
- Placement of site notices in English and Afrikaans (as per regulations) were placed along the entrance road to the application site and around the site itself on 2 July 2021 (proof included in the Basic Assessment Report).
- Notification letters to be sent via E-mail or sms (if cellphone number / email is available, it is assuming the I&AP have an email or cellphone).
- Public notification of the BA process was advertised along with the WEF project, in a local newspaper (namely Die Courier) and a provincial newspaper (The Mercury) on the 19th of November 2021, as required according to Regulation 41(2) (c) of the EIA Regulations (2014), as amended. The availability of the Grid Project will again be advertised in a local newspaper and a provincial newspaper. Proof to be included in the Draft Basic Assessment Report.

Availability of report for review:

- Report available on SiVESTs website for download.
- Electronic copies can be made available to parties via a secure digital link that will be emailed upon request for the documentation.
- CDs / Flash drive to be posted, only if requested.
- The Draft Basic Assessment Report will be located and available for review at the following locations:
    - Beaufort West Library, 15 Church Street, Beaufort West, Western Cape, South Africa
    - Price Albert Public Library, 27 Church Street, Prince Albert, Western Cape.

14.3.4 Summary of issues raised

To be updated once the Public Comment Period has been completed.

14.3.5 Details of notification of landowners

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

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

The *proposed* Koup 1 powerline development constitutes a linear activity and landowner consent is therefore not required. The landowners and/or occupants of the applicable farm portions will however be notified accordingly.

15. IMPACTS AND RISKS IDENTIFIED FOR THE PREFERRED ALTERNATIVE

The SiVEST Impact Assessment method, dated 28 July 2017 (attached as **Appendix 7**) has been utilised to assess the following potential impacts identified in the assessment phase and is presented in the following sections.

The method used in this impact assessment determines significance (can be both positive and negative) of an impact by multiplying the value of the environmental system or component affected by the magnitude of the impact on that system or component (System or Component Value x Impact Magnitude).

In this method, all significant impacts on the natural or biophysical environment are assessed in terms of the overall impacts on the health of ecosystems, habitats, communities, populations and species. Thus, for example, the impact of an increase in stormwater runoff generated by a development can only be assessed in terms of the impact on the health of the affected environmental systems.

Similarly, all significant impacts on the social and socio-economic environment are assessed in terms of the overall impacts to the quality of life, health and safety of the affected population, communities and/or individuals, with the exception of impacts on resources that are assessed on their own.

The following impacts have been identified for the proposed project:

Table 19: Final Impact Assessment Table: Koup 1 Grid

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATU	S		E	P	R	L	D	I / M	TOTAL	STATU	S
Planning Phase																				
Archaeological	Damage to two historical farmsteads/structures (Kh001 and Kh001b) which are located within the proposed grid corridor area.	2	2	4	4	4	2	32	-	Medium	• Demarcate sites as no-go areas (30m buffer) • Demarcate and fence during construction if construction activities area to happen within 30 meters from a site. • A management plan, after a walkdown of the final layout, for the heritage resources needs to be compiled and approved for implementation during construction and operations.	2	1	4	4	4	1	15	_	Low
Archaeological	Due to the size of the area assessed, there's a possibility of encountering unidentified heritage features in un-surveyed areas does exist.	1	3	4	2	4	2	28	-	Medium	• A management plan, after a walkdown of the final layout, for the heritage resources needs to be compiled and approved for implementation during construction and operations.	1	3	4	2	4	1	14	_	Low
Cultural: Ecological	Inappropriate infrastructure layout planning degrades ecological elements of the cultural landscape.	2	4	3	3	3	2	30	-	Medium	• Critical Biodiversity Areas, and Ecological Support Areas (along drainage lines), should be protected from development of the wind turbines, grid infrastructure or any associated development during all phases. • Identified medicinal plants used for healing or ritual purposes should be conserved during all phases • Careful planning should incorporate areas for stormwater runoff where the base of the structure disturbed the natural soil. Local rocks found on the site could be used to slow stormwater (instead of concrete, or standard edge treatments), and prevent erosion that would be an unfortunate consequence that would alter the character of the site. By using rocks from site it helps to sensitively keep to the character.	2	2	2	2	3	2	22	-	Low
Cultural: Aesthetic	Inappropriate infrastructure layout planning negates aesthetic and sense of place requirements of the cultural landscape - Relocation of turbines has been offset with grid corridor, laydown and substation locations.	2	4	3	3	3	3	45	-	High	• Where additional infrastructure (i.e. roads) is needed, the upgrade of existing roads to accommodate the development should be the first consideration. • Avoid development of infrastructure (such as buildings, wind turbines and power lines), on crests or ridgelines due to the impact on the visual sensitivity of skylines. The visual impact of turbines can be reduced by distancing them from viewpoints such as roads and farmsteads, and placing them in lower lying plains to reduce their impact on the surrounding sensitive cultural landscape. • Significant and place-making viewsheds of surrounding ridgelines and distant mountain should be maintained by limiting the placement of turbines or associated infrastructure on opposing sides of any of the regional roads, so that at any time a turbine-free view can be found when travelling through the landscape or at the historic farmsteads. • Retain view-lines and vistas focused on prominent natural features such as mountain peaks or hills, such as Platdoring se Kop and the Koup 1 poort, as these are important place making and orientating elements for experiencing the cultural landscape. • Prevent the construction of new buildings/structures/ new roads on visually sensitive, steep, elevated or exposed slopes, ridgelines and hillcrests. • Due to the historic and local experience of the landscape from the farm roads, which link the historically significant farmsteads across the region, a buffer of 300m from the farm roads should be maintained for no development associated with the WEF other than sensitive road upgrades which must not impact on the views from the road. • Alternatives Option 1(sub1) for the grid corridor and Option 1 for the laydown area, are preferred in terms of cultural landscape assessment as they limit the construction to a smaller footprint on the landscape and locate the infrastructure far enough from the N12 and out of the Koup 1 landscape as far possible. They should be moved as far away from the farm road as possible without impacting on a riverine corridor flood line or a slope over 3%. • views from the road. • Alternatives Option 1(sub1) for the grid corridor and Option 1 for the laydown area, are preferred in terms of cultural landscape assessment as they limit the construction to a smaller footprint on the landscape and locate the infrastructure far enough from the N12 and out of the Koup 1 landscape as far possible. They should be moved out of the historic farm road buffer without impacting on a riverine corridor flood line or a slope over 3%. • The substation location should be located on the same side as other development infrastructure and to the north of the farm road so as to limit the visual impact to one viewshed. As there is a ridge behind this development area, for which turbine placement is proposed, location of the	2	4	2	3	3	3	42	-	Medium

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATU	S		E	P	R	L	D	I / M	TOTAL	STATU	S
											substation to the north of the farm road contains the impact to one side of the road and the infrastructure will not interrupt view lines of the mountain ranges in the distance.									
Cultural: Historic	Inappropriate infrastructure layout planning degrades historic elements of the cultural landscape.	2	4	3	2	3	3	42	-	Medium	• Due to the scenic and historic significance of the regional road, a buffer of 1000m to either side of the N12 should be maintained for no development associated with the WEF other than sensitive road upgrades, which must not impact on the views from the road. The visual impact of the turbines will be 50% less at 1000m distance and therefore this distance will greatly reduce the negative visual impact of the turbines on the experience of the historic road and the values that give it significance. • The integrity of the historic farmsteads and their associated cultivated areas and relationship to the riverine corridors and other natural elements, such as Platdoring se Kop, should be maintained and protected. • Any development that impacts the inherent character of the WEF component should be discouraged and a development buffer of 50m around the outer boundary of farm WEF and 200m around any graded heritage structure, must be maintained, including the associated cultivated areas, cemeteries and unmarked graves, for all new infrastructure. • Due to the historic and local experience of the landscape from the farm roads, which link the historically significant farmsteads across the region, a buffer of 300m from the farm roads should be maintained for no development associated with the WEF other than sensitive road upgrades which must not impact on the views from the road. • Buffers from identified stone markers and foundations should be in accordance with the AIA (PGS, 2021) where they are not directly associated with an historic farmstead. • The existing names of places, routes, watercourses and natural features in the landscape that are related to its use, history and natural character should be retained and used as heritage resources related to intangible heritage. • Burial grounds and places of worship are automatically regarded as Grade IIIa or higher. Any development that threatens the inherent character of family burial grounds must be assessed and should be discouraged. No development closer than 100m from the boundary of any burial grounds or unmarked graves. No turbines have been proposed for placement near known unmarked burials or family cemeteries. A preconstruction micro-survey of each turbine footprint and any new access roads should be conducted to ensure no further unmarked graves are threatened. • Commonages and outspans were located at water points, and these places were likely gathering points before the arrival of colonists and continued to provide communal resources. In the mid-20th century, many old commonages came under the ownership of the Municipality, and have since been rented out to private individuals or organisations. The Municipality should facilitate the use of common land in a way that promotes the well-being and quality of life of the public. These sites can play a restorative role within the community, for instance for those who have limited alternative opportunities for recreation. • Respect existing patterns, typologies and traditions of settlement-making by promoting the continuity of heritage features. These include: (a) indigenous; (b) colonial; and (c) current living heritage in the form of tangible and intangible associations to place. • Alterations and additions to conservation-worthy structures should be sympathetic to their architectural character and period detailing.	2	2	2	1	3	2	20	-	Low
Cultural: Socio-economic	Non-landowner residents' lack of representation in planning and public participation process leads to loss of local knowledge, socio-economic empowerment and character of the cultural landscape.	2	4	4	3	4	4	68	-	Very High	• The findings of this report must be shared with identified interested and affected parties, including non-landowner residents on the development properties, in the EIA public participation process in order to further ascertain any intangible cultural resources that may exist on the landscape that have not been identified. A specialist qualified in recognising and discussing significance of intangible heritage resources should be present during the public meetings. The findings should inform the recommendations for appropriate mitigation for impacts to the cultural landscape. • The continued use of the landscape for human habitation and cultivation by historic residents of the area, should be retained and encouraged as far possible to sustain the continual use pattern and human-environment relationship which is the ultimate significance of this cultural landscape element. The WEF development must allow and support this, including financially, and not degrade this continued relationship. • The local community on and around the development should benefit from job opportunities created by the proposed development and the development should not cause reduction in economic viability of surrounding properties in excess of those offered by the development. Short-	2	2	1	2	4	2	22	+	Low

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATU	S		E	P	R	L	D	I / M	TOTAL	STATU	S
											• term job opportunities at the expense of long term economic benefit and local employment opportunities must be prevented. • Local residents must be offered employment on the construction/ decommissioning and operational phases before 'importing' staff from elsewhere. • Local residents must be offered employment training opportunities associated with WEF developments at all phases.									
Construction Phase																				
Avifauna	Displacement of priority species due to habitat destruction in the substation footprint	1	1	3	4	3	1	12	-	Low	• A site-specific Construction Environmental Management Programme (CEMPr) must be implemented, which gives appropriate and detailed description of how construction activities must be conducted to reduce unnecessary destruction and degradation of habitat. All contractors are to adhere to the CEMPr and should apply good environmental practice during construction. • The minimum footprint areas for infrastructure should be used. • Following construction, rehabilitation of all areas disturbed (e.g. temporary access tracks) must be undertaken and to this end a habitat restoration plan is to be developed by a rehabilitation specialist and implemented accordingly.	1	1	3	4	3	1	12	_	Low
Avifauna	Displacement of priority species due to disturbance associated with the construction activities	1	3	2	3	1	3	30	-	Medium	• No off-road driving should be allowed. • Existing roads should be used as much as possible. • Measures to control noise must be implemented according to industry best practice • Access to the rest of the property must be restricted • Should Corridor Option 3 be utilised, no construction activities within 2km of the Martial Eagle nest on Tower 108 of the Droërivier Proteus 1 400kV line should take place in the period May to November, which is the breeding season for the birds.	1	2	2	1	1	2	14	_	Low
Cultural: Ecological	Fragmentation and destruction of the landscape degrading the environment and thus continuous relationship between man and environment	2	4	3	3	3	3	45	-	High	• Critical Biodiversity Areas, and Ecological Support Areas (along drainage lines), should be protected from development of the wind turbines or any associated development during all phases. • No wind turbines should be placed within the 1:100-year flood line of the watercourses. In the context of the sensitivity to soil erosion in the area, as well as potential archaeological resources, it would be a risk to include any structures close to these drainage lines • Remaining areas of endemic and endangered natural vegetation should be conserved. • Critical Biodiversity Areas, and Ecological Support Areas (along drainage lines), should be protected from development of the wind turbines or any associated development during all phases. • Areas of critical biodiversity should be protected from any damage during all phases; where indigenous and endemic vegetation should be preserved at all cost. • Areas of habitat are found among the rocky outcrops and contribute to the character, as well as biodiversity of the area. Care should be taken that habitats are not needlessly destroyed. • Identified medicinal plants used for healing or ritual purposes should be conserved during all phases if threatened for use. • Careful planning should incorporate areas for stormwater runoff where the base of the structure disturbed the natural soil. Local rocks found on the site could be used to slow stormwater (instead of concrete, or standard edge treatments), and prevent erosion that would be an unfortunate consequence that would alter the character of the site. By using rocks from site it helps to sensitively keep to the character.	2	2	2	1	3	2	20	-	Low
Cultural: Aesthetic	Gridline infrastructure construction and decommissioning activity degrades the character of the cultural landscape and the sense of place	2	4	3	3	3	4	60	-	High	• Encourage mitigation measures (for instance use of vegetation) to 'embed' or disguise the proposed structures within the surrounding tourism and agricultural landscape at ground level, road edges etc.; • The continuation of the traditional use of material could be enhanced with the use of the rocks on the site as building material. This would also help to embed structures into the landscape and should not consist of shipping containers or highly reflective untreated corrugated sheeting that clutters the landscape and is exacerbates the foreign intrusion on the natural matte landscape. • Using material found on the site adds to the sense of place and reduces transportation costs of bringing materials to site. • The local material such as the rocks found within the area could be applied to address storm water runoff from the road to prevent erosion.	2	4	2	2	2	2	24	-	Medium

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		E	P	R	L	D	I / M	TOTAL	STATU	S		E	P	R	L	D	I / M	TOTAL	STATU	S
											• Duration and magnitude of construction/ decommissioning activity must be minimized as far possible to reduce the impact of heavy vehicles on the roads as well as the associated dust from the activity. Lightest vehicles possible should be used to reduce degradation to the farm roads and the need to upgrade roads to scale and extent that negatively impacts on the integrity of the historic farm roads. Construction/ decommissioning traffic must operate at speeds that reduce dust and noise as far possible. • Any new road network or widening must be returned to its original state at end of the operational time of the WEF, with full environmental and aesthetic rehabilitation to the approval of a qualified cultural landscapes assessment specialist. • Turbine sites, substation and laydown areas should be returned to their original state at the end of the operational time of the WEF, with full environmental and aesthetic rehabilitation to the approval of a qualified cultural landscapes assessment specialist.								
Cultural: Historic	Integrity of farmsteads and farm roads degraded by insensitive construction or decommissioning activities.	2	4	4	2	4	4	68	-	Very High	• Historic farmsteads must be protected from the impacts of heavy construction vehicles and increased numbers of people. No construction traffic should pass through or closer than 50m to the outer boundaries of a farm werf, or 200m from graded structures, which includes the associated historically cultivated lands, • cemeteries, unmarked burials. The most appropriate use of existing farm roads must be found to avoid farm werfs as far as possible and reduce construction impact on these heritage features. • Duration and magnitude of construction/ decommissioning activity must be minimized as far possible to reduce the impact of heavy vehicles on the roads as well as the associated dust from the activity. Lightest vehicles possible should be used to reduce degradation to the farm roads and the need to upgrade roads to scale and extent that negatively impacts on the integrity of the historic farm roads. Construction decommissioning traffic must operate at speeds that reduce dust and noise as far possible. • Accommodation of construction staff must not negatively impact on existing farm residents or degrade the integrity of the farmstead complexes and should, without negative impact to ecological or aesthetic resources, be located outside of the farmstead complexes or site. Farm residents should be consulted on the preferable location for construction staff accommodation. • Traditional planting patterns should be protected by ensuring that existing trees are not needlessly destroyed, as these signify traces of cultural intervention in a harsh environment. These planting patterns include the trees planted around the werfs and along travel routes. Interpretation of these landscape features as historic remnants should occur. A buffer of 50m around such planting patters should be maintained. • Burial grounds and places of worship are automatically regarded as Grade IIIa or higher. Any development that threatens the inherent character of family burial grounds must be assessed and should be discouraged. No turbines have been proposed for placement near known unmarked burials or family cemeteries. A preconstruction micro-survey of each turbine footprint and any new access roads should be conducted to ensure no further unmarked graves are threatened. • Mountain slopes have been used for traditional practices for many years, and care should be taken that any significant cultural sites, such as burials and veldkos/medicinal plant resources, are not disturbed. • Farms in the area followed a system of stone markers to demarcate the farm boundaries in the area. Where these structures are found on the site, care should be taken that they are not needlessly destroyed, as they add to the layering of the area. • Roads running through the area have historic stone way markers. Where these are found care should be taken that they are left intact and in place. Road upgrades must not move or threaten their position and they should be visible from the road they are related to by passing travellers. • Where the historic function of a building/site is still intact, the function has heritage value and should be protected. • Surviving examples (wagon routes, outspans, and commonage), where they are owned in some public or communal way (or by a body responsible for acting in the public interest) and where they are found to be actively operating in a communal way, will have cultural and heritage value and should be enhanced and retained. The historic route running through Koup 1 should be maintained and integrity as a communal road for farm residents must be retained.	2	2	3	2	2	2	22	-	Low

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		E	P	R	L	D	I / M	TOTAL	STATU	S		E	P	R	L	D	I / M	TOTAL	STATU	S
Cultural: Socio-economic	Integrity of local residents to continue their patterns of land use is degraded by the construction and decommissioning activities.	2	3	4	4	4	4	68	-	Very High	• An updated cultural landscapes impact assessment report must be completed should the WEF continue to be used after the term granted in this application. This report should include a detailed assessment of the socio-economic impacts to the cultural landscape and its outcomes and recommendations need to be considered in the decision for recommissioning and be implemented if recommissioning is approved. • The continued use of the landscape for human habitation and cultivation by historic residents of the area, should be retained and encouraged as far possible to sustain the continual use pattern and human-environment relationship which is the ultimate significance of this cultural landscape element. The WEF development must allow and support this, including financially, and not degrade this continued relationship. • The local community on and around the development should benefit from job opportunities created by the proposed development and the development should not cause reduction in economic viability of surrounding properties in excess of those offered by the development. Short-term job opportunities at the expense of long term economic benefit and local employment opportunities must be prevented. • Local residents must be offered employment on the construction/ decommissioning and operational phases before 'importing' staff from elsewhere. • Local residents must be offered employment training opportunities associated with WEF developments at all phases. • Sheep, cattle or game farming should be allowed to continue below the wind turbines, or be rehabilitated to increase biodiversity in the area.	1	3	3	1	3	2	22	-	Low
Biodiversity: Vegetation	Vegetation clearing for access roads, turbines and their service areas and other infrastructure will impact on vegetation and protected plant species.	1	4	2	2	3	2	24	-	Medium	• Pre-construction walk-through of the facility's final layout in order to locate species of conservation concern that can be translocated as well as comply with the Cape Nature permit conditions. • Search and rescue for identified species of concern before construction. • Vegetation clearing to commence only after walk-through has been conducted and necessary permits obtained. • Pre-construction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes awareness of no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, remaining within demarcated construction areas etc. • Contractor's Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities within sensitive areas. • Vegetation clearing to be kept to a minimum. No unnecessary vegetation to be cleared. • All construction vehicles should adhere to clearly defined and demarcated roads. No off-road driving to be allowed outside of the construction area. • Temporary laydown areas should be located within previously transformed areas or areas that have been identified as being of low sensitivity. These areas should be rehabilitated after use.	1	3	2	1	2	2	18	_	Low
Biodiversity: Fauna	Disturbance, transformation and loss of habitat will have a negative effect on resident fauna during construction. Due to noise and operation of heavy machinery, faunal disturbance will extend well beyond the footprint and extend into adjacent areas. This will however be transient and restricted to the construction phase.	1	3	2	2	1	3	27	-	Medium	• All personnel should undergo environmental induction with regards to fauna and, in particular, awareness about not harming or collecting species such as snakes, tortoises and owls, which are often persecuted out of superstition. • Any fauna threatened by the construction activities should be removed to safety by an appropriately qualified environmental officer. • All construction vehicles should adhere to a low speed limit (30km/h) to avoid collisions with susceptible species such as snakes and tortoises. • All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. • If trenches need to be dug for pylons or other purpose, these should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are standing open should have places where there are soil ramps allowing fauna to escape the trench.	1	3	1	1	1	3	21	_	Low

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		E	P	R	L	D	I / M	TOTAL	STATU	S		E	P	R	L	D	I / M	TOTAL	STATU	S
Geotechnical: Removal of subsoils (soil, rock)	Displacement of natural earth material and overlying vegetation. 8) Increase stormwater velocity. 9) Increase in soil and wind erosion due to clearing of vegetation. 10) Construction and earthmoving vehicles may displace soil during operations. 11) Creation of drainage paths along access tracks. 12) Potential oil spillages from heavy plant. 13) Sedimentation of non-perennial features and excessive dust. 14) Potential groundwater and drainage feature contamination.	1	4	2	2	2	2	22	_	Low	• Identify protected areas prior to construction. • Construction of temporary berms and drainage channels to divert surface water. • Minimize earthworks and fills. • Use existing road network and access tracks. • Rehabilitation of affected areas (such as regrassing, mechanical stabilization). • Correct engineering design and construction of gravel roads and water crossings. • Correct construction methods for foundation installations and cut to fill configurations. • Vehicle repairs to be undertaken in designated areas. • Control stormwater flow	1	2	2	1	4	2	20	_	Low
Transportation: Additional Traffic Generation	Increase in Traffic	2	3	1	2	1	2	18	_	Low	• Ensure staff transport is done in the ‘off peak’ periods and by bus. • Stagger material, component and abnormal loads • Construction of an on-site concrete batching plant to reduce trips.	2	3	1	2	1	2	18	_	Low
Transportation: Additional Traffic Generation	Increase of Incidents with pedestrians and livestock	2	4	2	4	1	2	26	_	Medium	• Reduction in speed of vehicles • Adequate enforcement of the law • Implementation of pedestrian safety initiatives • Regular maintenance of farm fences & access cattle grids • Construction of an on-site concrete batching plant to reduce trips.	2	3	2	4	1	1	12	_	Low
Transportation: Additional Traffic Generation	Increase in Dust from gravel roads	2	3	2	2	1	2	20	_	Low	• Reduction in speed of vehicles • Use of dust suppressant techniques • Implement a road maintenance program under the auspices of the respective transport department. • Construction of an on-site concrete batching plant to reduce trips.	2	3	2	2	1	2	20	_	Low
Transportation: Additional Traffic Generation	Increase in Road Maintenance	2	3	2	2	2	2	22	_	Low	• Implement a road maintenance program under the auspices of the respective transport department. • Construction of an on-site batching plant to reduce trips.	2	3	2	2	1	2	20	_	Low
Transportation: Abnormal Loads	Additional Abnormal Loads	3	2	1	2	1	1	9	_	Low	• Ensure abnormal vehicles travel to and from the proposed development in the ‘off peak’ periods or stagger delivery. • Adequate enforcement of the law	3	2	1	2	1	1	9	_	Low
Transportation: Access Roads	Increase in dust from gravel roads	1	4	1	1	1	2	16	_	Low	• Enforce a maximum speed limit on the development • Use of dust suppressant techniques • Adequate watering by means of water bowser	1	3	1	1	1	2	14	_	Low
Transportation: Access Roads	New/Larger Access points	1	4	1	2	1	1	9	_	Low	• Adequate road signage according to the SARTSM • Approval from the respective roads department	1	4	1	2	1	1	9	_	Low

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		E	P	R	L	D	I / M	TOTAL	STATU	S		E	P	R	L	D	I / M	TOTAL	STATU	S
Visual: 3. Potential alteration of the visual character and sense of place. 4. Potential visual impact on receptors in the study area	• Large construction vehicles, equipment and construction material stockpiles will alter the natural character of the study area and expose visual receptors to impacts associated with construction. • Construction activities may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings. • Dust emissions and dust plumes from increased traffic on gravel roads serving the construction site may evoke negative sentiments from surrounding viewers. • Surface disturbance during construction would expose bare soil resulting in visual scarring of the landscape and increasing the level of visual contrast with the surrounding environment. • Vegetation clearance required for the construction of the proposed substation is expected to increase dust emissions and alter the natural character of the surrounding area, thus creating a visual impact. • Temporary stockpiling of soil during construction may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.	2	3	1	2	1	2	18	_	Low	• Carefully plan to minimise the construction period and avoid construction delays. • Inform receptors within 500m of the proposed power line servitude of the construction programme and schedules. • Minimise vegetation clearing and rehabilitate cleared areas as soon as possible. • Maintain a neat construction site by removing rubble and waste materials regularly. • Position storage / stockpile areas in unobtrusive positions in the landscape, where possible. • Make use of existing gravel access roads where possible. • Limit the number of vehicles and trucks travelling to and from the construction site, where possible. • Unless there are water shortages, ensure that dust suppression techniques are implemented on: o all access roads; o in all areas where vegetation clearing has taken place; o on all soil stockpiles.	2	2	1	1	1	2	14	_	Low
Surface Water: Loss of aquatic species of special concern	During construction activities within watercourses could result in the disturbance or destruction of any listed and or protected plant or animal species. However none of these aquatic obligate species were observed during this assessment	1	1	1	1	1	1	5	_	Low	Develop and implement an Aquatic Rehabilitation and Monitoring plan post Environmental Authorisation. This must be developed following the finalisation of the turbine / road layout and grid infrastructure and a walk down has been completed.	1	1	1	1	1	1	5	_	Low
Surface Water: Damage or loss of riparian and or drainage line systems i.e. disturbance of the waterbodies in the construction phase	Construction could result in the loss of drainage systems that are fully functional and provide an ecosystem services within the site especially where new access roads are required or road upgrades will widen any current bridges or drifts. Loss can also include a functional loss, through change in vegetation type via alien encroachment for example	2	3	2	2	3	2	24	_	Medium	• A pre-construction walkthrough with an aquatic specialist is recommended and they can assist with the development of the stormwater management plan and Aquatic Rehabilitation and Monitoring plan, coupled to micro-siting of the final layout. • All alien plant re-growth, which is currently low within the greater region must be monitored and should it occur, these plants must be eradicated within the project footprints and especially in areas near the proposed crossings. *Prosopis* (alien invasive riparian tree) is prevalent in areas to the north of the site, thus care in transporting any material, while ensuring that such materials is free of alien seed, coupled with pre and post alien clearing must be stipulated in the EMPr. Where roads and crossings are upgraded, the following applies: • Existing pipe culverts must be removed and replaced with suitable sized box culverts, especially where road levels are raised to accommodate any large vehicles. • River levels, regardless of the current state of the river / water course must be reinstated thus preventing any impoundments from being formed. The related designs must be assessed by an aquatic specialist during a pre-construction walkdown. • Where large cut and fill areas are required these must be stabilised and rehabilitated during the construction process, to minimise erosion and sedimentation. • Suitable stormwater management systems must be installed along roads and other areas and monitored during the first few months of use. Any erosion / sedimentation must be resolved through whatever additional interventions maybe necessary (i.e., extension, energy dissipaters, spreaders, etc). • A detailed monitoring plan must be developed in the pre-construction phase by an aquatic specialist, where any delineated system occurs within 50 m of existing crossings.	1	3	2	1	2	2	18	_	Low

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Surface Water: Potential impact on localised surface water quality (construction materials and fuel storage facilities) during the construction and decommissioning phases	During construction earthworks will expose and mobilise earth materials, and a number of materials as well as chemicals will be imported and used on site and may end up in the surface water, including soaps, oils, grease and fuels, human wastes, cementitious wastes, paints and solvents, etc. Any spills during transport or while works area conducted in proximity to a watercourse has the potential to affect the surrounding biota. Leaks or spills from storage facilities also pose a risk and due consideration to the safe design and management of the 30 000l fuel storage facility must be given. Although unlikely, consideration must also be provided for the proposed Battery Energy Storage System (BESS), with regard safe handling during the construction phase. This to avoid any spills or leaks from this system	1	3	2	2	3	3	33	_	Medium	• All liquid chemicals including fuels and oil, including the BESS must be stored in with secondary containment (bunds or containers or berms) that can contain a leak or spill. Such facilities must be inspected routinely and must have the suitable PPE and spill kits needed to contain likely worst-case scenario leak or spill in that facility, safely. • Washing and cleaning of equipment must be done in designated wash bays, where rinse water is contained in evaporation/sedimentation ponds (to capture oils, grease cement and sediment). • Mechanical plant and bowsers must not be refuelled or serviced within 100m of a river channel. • All construction camps, lay down areas, wash bays, batching plants or areas and any stores should be more than 50 m from any demarcated water courses. Note comment regards Camp A that requires micro-siting. • Littering and contamination associated with construction activity must be avoided through effective construction camp management; • No stockpiling should take place within or near a water course • All stockpiles must be protected and located in flat areas where run-off will be minimised and sediment recoverable;	1	3	2	1	2	2	18	_	Low
Socio-Economic: Health and social wellbeing	Air Quality	1	3	1	1	1	2	14	_	Low	• Where appropriate apply dust suppression measures on a regular basis. Ensure that vehicles used to transport sand and building materials are fitted with tarpaulins or covers. • Ensure that all vehicles are roadworthy and drivers are qualified and made aware of the potential noise and dust issues. • Appoint a community liaison officer to deal with complaints and grievances from the public.	1	3	1	1	1	1	7	_	Low
Socio-Economic: Health and social wellbeing	Noise	1	1	1	1	3	1	7	_	Low	Refer to the mitigation measures suggested by the noise specialist.	1	1	1	1	1	1	5	_	Low
Socio-Economic: Health and social wellbeing	Increase in crime	2	2	3	2	2	2	22	_	Low	• Ensure that construction workers are clearly identifiable. All workers should carry identification cards and wear identifiable clothing. • Fence off the construction sites and control access to these sites. • Appoint an independent security company to monitor the site; • Encourage local people to report any suspicious activity associated with the construction sites through the establishment of a community liaison forum. • Prevent loitering within the vicinity of the construction camp as well as construction sites.	2	2	3	2	2	2	22	_	Low
Socio-Economic: Health and social wellbeing	Increased risk of HIV infections	3	4	3	3	3	3	48	_	High	• Ensure that an onsite HIV Infections Policy is in place and that construction workers have easy access to condoms. • Expose workers to a health and HIV/AIDS awareness educational program. • Extend the HIV/AIDS program into the community with a specific focus on schools and youth clubs.	3	3	2	2	3	2	26	_	Medium
Socio-Economic: Health and social wellbeing	Influx of construction workers	1	4	1	1	1	2	16	_	Low	• Communicate the limitation of opportunities created by the project through Community Leaders and Ward Councillors. • Draw up a recruitment policy in consultation with the Community Leaders and Ward Councillors of the area and ensure compliance with this policy.	1	4	1	1	1	2	16	_	Low
Socio-Economic: Health and social wellbeing	Hazard Exposure	2	4	2	2	1	2	22	_	Low	• Ensure that all construction equipment and vehicles are properly maintained at all times. • Ensure that operators and drivers are properly trained and make them aware, through regular toolbox talks, of any risk they may pose to the community. Place specific emphasis on the vulnerable sector of the population such as children and the elderly. • Ensure that fires lit by construction staff are only ignited in designated areas and that the appropriate safety precautions, such as not lighting fires in strong winds and completely extinguishing fires before leaving them unattended, are strictly adhered to. • Make staff aware of the dangers of fire during regular toolbox talks.	2	2	2	2	1	2	18	_	Low

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Socio-Economic: Quality of the living environment	Disruption of daily living patterns	2	4	2	2	1	2	22	_	Low	• Ensure that, at all times, people have access to their properties as well as to social facilities.	2	3	2	2	1	2	20	_	Low
Socio-Economic: Quality of the living environment	Disruptions to social and community infrastructure	2	4	2	2	1	2	22	_	Low	• Regularly monitor the effect that construction is having on infrastructure and immediately report any damage to infrastructure to the appropriate authority. • Ensure that where communities' access is obstructed that this access is restored to an acceptable state.	2	3	2	2	1	2	20	_	Low
Socio-Economic: Economic	Job creation and skills development	2	4	2	3	1	2	24	+	Medium	• Wherever feasible, local residents should be recruited to fill semi and unskilled jobs. • Women should be given equal employment opportunities and encouraged to apply for positions. • A skills transfer plan should be put in place at an early stage and workers should be given the opportunity to develop skills which they can use to secure jobs elsewhere post-construction.	2	4	2	3	1	2	24	+	Medium
Socio-Economic: Economic	Socio-economic stimulation.	3	4	2	3	1	2	26	+	Medium	• A procurement policy promoting the use of local business should, where possible, be put in place to be applied throughout the construction phase.	3	4	2	3	1	2	26	+	Medium
Palaeontological: Fossil heritage resources	Disturbance, damage or destruction of fossils at or beneath the ground surface due to surface clearance and bedrock excavations	1	4	4	3	4	2	32	-	Medium	• Pre-construction walkdown (with fossil recording / collection) of final footprint by specialist palaeontologist. • Chance Fossil Finds Procedure during construction phase.	1	2	4	2	4	1	13	-	Low
Operational Phase																				
Avifauna	Mortality of priority species due to collisions with the 132kV OHL	1	3	2	4	3	2	26	_	Medium	• An avifaunal specialist must conduct a site walk through of final pole positions prior to construction to determine where BFDs are required. • BFDs must be installed as per the instructions of the specialist following the walk through. • The operational monitoring programme must include regular monitoring (i.e. quarterly) of the powerlines for collision mortalities. • If additional collision hot-spots are identified during quarterly monitoring, these sections must be marked with BFDs to reduce the collision risk.	1	2	2	4	3	2	24	_	Medium
Cultural: Ecological	Inappropriate operational activities degrade the significant ecological elements of the cultural landscape - Relocation of turbines has been offset with grid corridor and collector substation locations.	1	4	4	2	3	4	56	-	High	• Areas of endemic and endangered natural vegetation should be conserved. • Critical Biodiversity Areas, and Ecological Support Areas (along drainage lines), should be protected. • Areas of habitat are found among the rocky outcrops and contribute to the character, as well as biodiversity of the area. Care should be taken that habitats are not needlessly destroyed. • Identified medicinal plants used for healing or ritual purposes should be conserved during all phases if threatened for use. Access to these resources should be made available to those who have had historic access to them.	1	1	4	2	3	2	22	-	Low
Cultural: Aesthetic	Inappropriate operational activities degrade the significant aesthetic elements of the cultural landscape altering the character and sense of place - Relocation of turbines has been offset with grid corridor, laydown and substation locations.	2	4	3	3	3	3	45	-	High	• Infrastructure improvement or maintenance work, including new roads and upgrades to the road network, should be appropriate to the rural context (scale, material etc.) and avoid steep slopes over 10% as well as ridges. • Prevent the construction of new buildings/structures on visually sensitive, steep (over 10%), elevated or exposed slopes, ridgelines and hillcrests or within 800m of the farmsteads and N12 and 300m of the farm roads. • Avoid visual clutter in the landscape by intrusive signage, and the intrusion of commercial, corporate development along roads. • Duration and magnitude of operational activity must be minimized as far possible to reduce the impact of heavy vehicles on the roads as well as the associated dust from the activity. Lightest vehicles possible should be used to reduce degradation to the farm roads and the need to upgrade roads to scale and extent that negatively impacts on the integrity of the historic farm roads. Operational traffic must operate at speeds that reduce dust and noise as far possible.	2	4	2	3	4	2	28	-	Medium

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Cultural: Historic	Inappropriate operational activities degrade the significant historic elements of the cultural landscape altering the character and sense of place	2	4	4	4	4	4	72	-	Very High	• Historic farmsteads must be protected from the impacts of operational facility vehicles and increased numbers of people. No WEF operations traffic should pass through or closer than 50m to the outer boundaries of a farm werf, or 200m from graded structures, which includes the associated historically cultivated lands, cemeteries, unmarked burials. The most appropriate use of existing farm roads must be found to avoid farm werfs as far as possible and reduce construction impact on these heritage features. • Traditional planting patterns should be protected by ensuring that existing trees are not needlessly destroyed, as these signify traces of cultural intervention in a harsh environment. These planting patterns include the trees planted around the werfs and along travel routes. Interpretation of these landscape features as historic remnants should occur. • Burial grounds and places of worship are automatically regarded as Grade IIIa or higher. Any development that threatens the inherent character of family burial grounds must be assessed and should be discouraged and a buffer of 100m around all burial ground or unmarked graves should be in place. No turbines have been proposed for placement near known unmarked burials or family cemeteries. A preconstruction micro-survey of each turbine footprint and any new access roads should be conducted to ensure no further unmarked graves are threatened. • Mountain slopes have been used for traditional practices for many years, and care should be taken that any significant cultural sites, such as burials and veldkos/medicinal plant resources, are not disturbed. • Farms in the area followed a system of stone markers to demarcate the farm boundaries in the area. Where these structures are found on the site, care should be taken that they are not needlessly destroyed, as they add to the layering of the area. • Roads running through the area may have historic stone way markers. Where these are found care should be taken that they are left in tact and in place. Road upgrades must not move or threaten their position and they should be visible from the road they are related to by passing travellers. • Where the historic function of a building/site is still intact, the function has heritage value and should be protected. • Surviving examples (wagon routes, outspans, and commonage), where they are owned in some public or communal way (or by a body responsible for acting in the public interest) and where they are found to be actively operating in a communal way, will have cultural and heritage value and should be enhanced and retained. The historic route running through Koup 1 should be maintained and integrity as a communal road for farm residents must be retained. • Accommodation of WEF staff must not negatively impact on existing farm residents or degrade the integrity of the farmstead complexes and should, without negative impact to ecological or aesthetic resources, be located outside of the farmstead complexes or site. Farm residents should be consulted on the preferable location for construction staff accommodation. • Lightest vehicles possible should be used to reduce degradation to the farm roads and the need to upgrade roads to scale and extent that negatively impacts on the integrity of the historic farm roads. Operational traffic must operate at speeds that reduce dust and noise as far possible.	2	2	4	2	3	2	26	-	Medium
Cultural: Socio-economic	Inappropriate operational activities degrade the significant socio-economic opportunities of the cultural landscape	2	4	3	4	4	4	68	-	Very High	• The local community on and around the development should benefit from job opportunities created by the proposed development and the development should not cause reduction in economic viability of surrounding properties in excess of those offered by the development. Short-term job opportunities at the expense of long term economic benefit and local employment opportunities must be prevented. • The continued use of the landscape for human habitation and cultivation by historic residents of the area, should be retained and encouraged as far possible to sustain the continual use pattern and human-environment relationship which is the ultimate significance of this cultural landscape element. The WEF development must allow and support this, including financially, and not degrade this continued relationship. • Local residents must be offered employment on the construction/ decommissioning and operational phases before 'importing' staff from elsewhere. • Local residents must be offered employment training opportunities associated with WEF developments at all phases. • Crop cultivation, sheep, cattle or game farming should be allowed to continue below the wind turbines, or be rehabilitated to increase biodiversity in the area.	2	3	2	2	3	2	24	+	Medium

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Biodiversity (Fauna)	Faunal disturbance and habitat degradation .The operation and presence of the power line may lead to disturbance or persecution of fauna during maintenance activities.	1	3	1	2	3	2	20	_	Low	• Any potentially dangerous fauna such as snakes or fauna threatened by the maintenance and operational activities should be removed to a safe location. • 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), 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 (30km/h max for heavy vehicles and 40km/h for light vehicles) to avoid collisions with susceptible species such as snakes and tortoises. • If any parts of the facility are to be fenced, then no electrified strands should be placed within 30cm of the ground as some species such as tortoises are susceptible to electrocution from electric fences because they do not move away when electrocuted but rather adopt defensive behaviour and are killed by repeated shocks. Alternatively, the electrified strands should be placed on the inside of the fence and not the outside.	1	2	1	1	3	2	16	_	Low
Biodiversity (Increased potential for soil erosion)	Disturbance created during construction will leave the site and its immediate surroundings vulnerable to erosion and alien plant invasion for several years into the operational phase	2	3	2	2	3	2	24	_	Medium	• Erosion management at the site should take place according to the Erosion Management Plan and Rehabilitation Plan. This should make provision for annual monitoring and rehabilitation. • All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. • There should be follow-up rehabilitation and revegetation of any remaining bare areas with indigenous perennial shrubs, grasses and trees from the local area. • Alien management at the site should take place according to the Alien Invasive Management Plan. • Regular (annual) monitoring for alien plants during operation to ensure that no alien invasive problems have developed as result of the disturbance, as per the Alien Management Plan for the project. • Woody aliens should be controlled on at least an annual basis using the appropriate alien control techniques as determined by the species present.	1	2	2	2	2	2	18	_	Low
Biodiversity (Vegetation)	Ecological degradation due to alien plant invasion	1	3	2	2	3	3	33	_	Medium	• There should be 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. Monitoring every 6 months for the first 2 years post-construction is recommended, followed by annual monitoring thereafter. • 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.	1	2	1	1	2	2	14	_	Low
Biodiversity (Negative impact on ESAs, CBAs and broad-scale ecological processes).	Transformation and presence of the grid connection and associated infrastructure will contribute to cumulative habitat loss within CBAs, ESAs and impact on broad-scale ecological processes such as fragmentation.	2	3	2	2	3	2	24	_	Medium	• The CBAs along the power line routes should be avoided or if they cannot be avoided, then the footprint in these areas should be minimized as much as possible. • There should be no pylons within the areas mapped as High Sensitivity along the drainage lines. There should be an integrated management plan for the development area during operation, which is beneficial to fauna and flora. • All disturbed areas that are not used such as excess road widths, should be rehabilitated with locally occurring shrubs and grasses after construction to reduce the overall footprint of the development. • Disturbance on the site should be kept to a minimum during operation and maintenance activities.	1	2	2	1	3	2	18	_	Low
Geotechnical: Removal of subsoils (soil, rock)	Displacement of natural earth material. 1) Increase in soil erosion. 2) Potential oil spillages from maintenance vehicles. 3) Sedimentation of non-perennial features caused by soil erosion.	1	2	2	2	3	1	10	_	Low	• Use of existing roads and tracks where feasible. • Rehabilitation of affected areas (such as erosion control mats). • Correct engineering design and construction of roads and water crossings. • Vehicle repairs to be undertaken in designated areas. • Maintenance of stormwater system.	1	3	2	2	3	2	22	_	Low
Transportation: Additional Traffic Generation	Increase in Traffic	2	1	1	2	3	1	9	_	Low	• The increase in traffic for this phase of the development is negligible and will not have a significant impact	2	1	1	2	3	1	9	_	Low

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Transportation: Additional Traffic Generation	Increase of Incidents with pedestrians and livestock	2	1	1	2	3	1	9	_	Low	• The increase in traffic for this phase of the development is negligible and will not have a significant impact	2	1	1	2	3	1	9	_	Low
Transportation: Additional Traffic Generation	Increase in Dust from gravel roads	2	1	1	2	3	1	9	_	Low	• The increase in traffic for this phase of the development is negligible and will not have a significant impact	2	1	1	2	3	1	9	_	Low
Transportation: Additional Traffic Generation	Increase in Road Maintenance	2	1	1	2	3	1	9	_	Low	• The increase in traffic for this phase of the development is negligible and will not have a significant impact	2	1	1	2	3	1	9	_	Low
Transportation: Abnormal Loads	Additional Abnormal Loads	2	1	1	2	3	1	9	_	Low	• The increase in traffic for this phase of the development is negligible and will not have a significant impact	2	1	1	2	3	1	9	_	Low
Transportation: Internal Access Roads	New/Larger Access points	2	1	1	2	3	1	9	_	Low	• Adequate road signage according to the SARTSM	2	1	1	2	3	1	9	_	Low
Visual: • Potential alteration of the visual character and sense of place. • Potential visual impact on receptors in the study area.	• The proposed power line and substation could alter the visual character of the surrounding area and expose sensitive visual receptor locations to visual impacts. • The development may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings. • Dust emissions and dust plumes from maintenance vehicles accessing the site via gravel roads may evoke negative sentiments from surrounding viewers. • The night time visual environment could be altered as a result of operational and security lighting at the proposed substation.	2	4	2	2	3	1	13	_	Low	• Where possible, limit the number of maintenance vehicles using access roads. • Where possible, limit the amount of security and operational lighting present at the on-site substation. • Light fittings for security at night should reflect the light toward the ground and prevent light spill. • Buildings on the substation site should be painted with natural tones that fit with the surrounding environment. • Non-reflective surfaces should be utilised where possible.	2	4	2	2	3	1	13	_	Low
Surface Water: Impact on aquatic systems through the possible increase in surface water runoff on form and function during the operational phase	Increase in hard surface areas, and roads that require stormwater management will increase through the concentration of surface water flows that could result in localised changes to flows (volume) that would result in form and function changes within aquatic systems, which are currently ephemeral. This then increases the rate of erosions and sedimentation of downstream areas.	2	3	2	2	3	3	36	_	Medium	• A stormwater management plan must be developed in the preconstruction phase, detailing the stormwater structures and management interventions that must be installed to manage the increase of surface water flows directly into any natural systems. • This stormwater control systems must be inspected on an annual basis to ensure these are functional. • Effective stormwater management must include effective stabilisation (gabions and Reno mattresses) of exposed soil and the re-vegetation of any disturbed riverbanks	1	1	1	1	1	1	5	_	Low
Socio-Economic: Health and social wellbeing	Electromagnetic field and RF interference	2	2	1	2	2	2	18	_	Low	• Ensure that power lines are not routed in close proximity (with 300 meters) of residential areas to limit the effect off EMFs. • Consult with the appropriate telecommunication authorities to ensure that the telecommunication installations identified within the vicinity of the project are not compromised through RFI.	2	2	1	2	2	2	18	_	Low
Socio-Economic: Health and social wellbeing	Hazard exposure	1	2	2	2	3	2	20	_	Low	• Install early detection techniques to avoid or reduce structural damage. • Install lighting protection systems. • Install fire prevention and control measures.	1	2	2	2	3	2	20	_	Low

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Socio-Economic: Quality of the living environment	Transformation of the sense of place	3	4	3	3	3	3	48	_	High	• Apply the mitigation measures suggested in the Visual Impact Assessment Report. • Communicate the benefits associated with renewable energy to the broader community. • Ensure that all affected landowners and tourist associations are regularly consulted. • A Grievance Mechanism should be put in place and all grievances should be dealt with transparently. • The mitigation measures recommended in the Heritage and Palaeontology Impact Assessment should be followed.	3	4	3	3	3	3	48	_	High
Socio-Economic: Economic	Job creation and skills development	2	4	2	2	3	2	26	+	Medium	• Implement a training and skills development programme for locals. • Work closely with the appropriate municipal structures regarding establishing a social responsibility programme.	2	4	2	2	3	2	26	+	Medium
Socio-Economic: Economic	Socio-economic stimulation.	4	4	2	3	3	2	32	+	Medium	• Ensure that the procurement policy supports local enterprises. • Establish a social responsibility programme either in line with the REIPPP BID guidelines or equivalent. • Work closely with the appropriate municipal structures regarding establishing a social responsibility programme. • Ensure that any trusts or funds are strictly managed in respect of outcomes and funds.	4	4	2	3	3	2	32	+	Medium
Decommissioning Phase																				
Avifauna	Displacement due to disturbance associated with the dismantling of the grid connection.	1	4	1	2	1	2	18	_	Low	• No off-road driving should be allowed. • Existing roads should be used as much as possible. • Measures to control noise must be implemented according to industry best practice • Access to the rest of the property must be restricted • If Corridor Option 3 was utilised, no dismantling activities within 2km of the Martial Eagle nest on Tower 108 of the Droërivier Proteus 1 400kV line should take place in the period May to November, which is the breeding season for the birds.	1	3	1	2	1	2	16	_	Low
Cultural: Ecological	Fragmentation and destruction of the landscape degrading the environment and thus continuous relationship between man and environment	2	4	3	3	3	3	45	-	High	• Critical Biodiversity Areas, and Ecological Support Areas (along drainage lines), should be protected from development of the wind turbines or any associated development during all phases. • No wind turbines should be placed within the 1:100-year flood line of the watercourses. In the context of the sensitivity to soil erosion in the area, as well as potential archaeological resources, it would be a risk to include any structures close to these drainage lines • Remaining areas of endemic and endangered natural vegetation should be conserved. • Critical Biodiversity Areas, and Ecological Support Areas (along drainage lines), should be protected from development of the wind turbines or any associated development during all phases. • Areas of critical biodiversity should be protected from any damage during all phases; where indigenous and endemic vegetation should be preserved at all cost. • Areas of habitat are found among the rocky outcrops and contribute to the character, as well as biodiversity of the area. Care should be taken that habitats are not needlessly destroyed. • Identified medicinal plants used for healing or ritual purposes should be conserved during all phases if threatened for use. • Careful planning should incorporate areas for stormwater runoff where the base of the structure disturbed the natural soil. Local rocks found on the site could be used to slow stormwater (instead of concrete, or standard edge treatments), and prevent erosion that would be an unfortunate consequence that would alter the character of the site. By using rocks from site it helps to sensitively keep to the character.	2	2	2	1	3	2	20	-	Low

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Cultural: Aesthetic	Gridline infrastructure construction and decommissioning activity degrades the character of the cultural landscape and the sense of place	2	4	3	3	3	4	60	-	High	• Encourage mitigation measures (for instance use of vegetation) to 'embed' or disguise the proposed structures within the surrounding tourism and agricultural landscape at ground level, road edges etc.; • The continuation of the traditional use of material could be enhanced with the use of the rocks on the site as building material. This would also help to embed structures into the landscape and should not consist of shipping containers or highly reflective untreated corrugated sheeting that clutters the landscape and is exacerbates the foreign intrusion on the natural matte landscape. • Using material found on the site adds to the sense of place and reduces transportation costs of bringing materials to site. • The local material such as the rocks found within the area could be applied to address storm water runoff from the road to prevent erosion. • Duration and magnitude of construction/ decommissioning activity must be minimized as far possible to reduce the impact of heavy vehicles on the roads as well as the associated dust from the activity. Lightest vehicles possible should be used to reduce degradation to the farm roads and the need to upgrade roads to scale and extent that negatively impacts on the integrity of the historic farm roads. Construction/ decommissioning traffic must operate at speeds that reduce dust and noise as far possible.	2	4	2	2	2	2	24	-	Medium
Cultural: Historic	Integrity of farmsteads and farm roads degraded by insensitive construction or decommissioning activities.	2	4	4	2	4	4	48	-	High	• Historic farmsteads must be protected from the impacts of heavy Construction/ decommissioning vehicles and increased numbers of people. No Construction/ decommissioning traffic should pass through or closer than 50m to the outer boundaries of a farm erf, or 200m from graded structures, which includes the associated historically cultivated lands, cemeteries, unmarked burials. The most appropriate use of existing farm roads must be found to avoid farm as far as possible and reduce Construction/ decommissioning impact on these heritage features. • Duration and magnitude of construction/ decommissioning activity must be minimized as far possible to reduce the impact of heavy vehicles on the roads as well as the associated dust from the activity. Lightest vehicles possible should be used to reduce degradation to the farm roads and the need to upgrade roads to scale and extent that negatively impacts on the integrity of the historic farm roads. Construction decommissioning traffic must operate at speeds that reduce dust and noise as far possible. • Accommodation of construction/decommissioning staff must not negatively impact on existing farm residents or degrade the integrity of the farmstead complexes and should, without negative impact to ecological or aesthetic resources, be located outside of the farmstead complexes or site. Farm residents should be consulted on the preferable location for construction/decommissioning staff accommodation. • Traditional planting patterns should be protected by ensuring that existing trees are not needlessly destroyed, as these signify traces of cultural intervention in a harsh environment. These planting patterns include the trees planted around the werfs and along travel routes. Interpretation of these landscape features as historic remnants should occur. A buffer of 50m around such planting patters should be maintained. • Burial grounds and places of worship are automatically regarded as Grade IIIa or higher. Any development that threatens the inherent character of family burial grounds must be assessed and should be discouraged. No turbines have been proposed for placement near known unmarked burials or family cemeteries. A preconstruction micro-survey of each turbine footprint and any new access roads should be conducted to ensure no further unmarked graves are threatened. • Mountain slopes have been used for traditional practices for many years, and care should be taken that any significant cultural sites, such as burials and veldkos/medicinal plant resources, are not disturbed. • Farms in the area followed a system of stone markers to demarcate the farm boundaries in the area. Where these structures are found on the site, care should be taken that they are not needlessly destroyed, as they add to the layering of the area. • Roads running through the area have historic stone way markers. Where these are found care should be taken that they are left intact and in place. Road upgrades must not move or threaten their position and they should be visible from the road they are related to by passing travellers. • Where the historic function of a building/site is still intact, the function has heritage value and should be protected. • Surviving examples (wagon routes, outspans, and commonage), where they are owned in some public or communal way (or by a body responsible for acting in the public interest) and where	2	2	3	2	2	2	22	-	Low

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											they are found to be actively operating in a communal way, will have cultural and heritage value and should be enhanced and retained. The historic route running through Koup 1 should be maintained and integrity as a communal road for farm residents must be retained. •									
Cultural: Socio-economic	Integrity of local residents to continue their patterns of land use is degraded by the construction and decommissioning activities.	2	3	4	4	4	4	68	-	High	• An updated cultural landscapes impact assessment report must be completed should the WEF continue to be used after the term granted in this application. This report should include a detailed assessment of the socio-economic impacts to the cultural landscape and its outcomes and recommendations need to be considered in the decision for recommissioning and be implemented if recommissioning is approved. • The continued use of the landscape for human habitation and cultivation by historic residents of the area, should be retained and encouraged as far possible to sustain the continual use pattern and human-environment relationship which is the ultimate significance of this cultural landscape element. The WEF development must allow and support this, including financially, and not degrade this continued relationship. • The local community on and around the development should benefit from job opportunities created by the proposed development and the development should not cause reduction in economic viability of surrounding properties in excess of those offered by the development. Short-term job opportunities at the expense of long term economic benefit and local employment opportunities must be prevented. • Local residents must be offered employment on the construction/ decommissioning and operational phases before 'importing' staff from elsewhere. • Local residents must be offered employment training opportunities associated with WEF developments at all phases. • Sheep, cattle or game farming should be allowed to continue below the wind turbines, or be rehabilitated to increase biodiversity in the area.	1	3	3	1	3	2	22	+	Low
Biodiversity (Fauna)	Due to disturbance, noise and the operation of heavy machinery, faunal disturbance due to decommissioning will extend beyond the footprint and impact adjacent areas to some degree. This will however be transient and restricted to the period while machinery is operational. In the long term, decommissioning should restore the ecological functioning and at least some habitat value to the affected areas.	1	2	1	2	1	3	21	_	Low	• All personnel should undergo environmental induction with regards to fauna and, in particular, awareness about not harming or collecting species such as snakes, tortoises and owls, which are often persecuted out of superstition. • Any fauna threatened by the decommissioning activities should be removed to safety by an appropriately qualified environmental officer. • All vehicles should adhere to a low speed limit to avoid collisions with susceptible species such as snakes and tortoises. • All hazardous materials should be stored in the appropriate manner to prevent contamination of the site and ultimately removed from the site as part of decommissioning. 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. • The site should be rehabilitated with locally occurring species to restore ecosystem structure and function. • No excavated holes or trenches should be left open for extended periods as fauna may fall in and become trapped. • All above-ground infrastructure should be removed from the site. Below-ground infrastructure such as cabling can be left in place if it does not pose a risk, as removal of such cables may generate additional disturbance and impact, however, this should be in accordance with the facilities' decommissioning and recycling plan, and as per the agreements with the land owners concerned.	1	2	1	1	1	3	18	_	Low
Biodiversity (Increased potential for soil erosion)	Following decommissioning, the site will be highly vulnerable to soil erosion due to the disturbance created by the removal of infrastructure from the site.	2	3	2	2	3	3	36	_	Medium	• Any roads that will not be rehabilitated should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk. • There should be regular monitoring (annual) for erosion for at least 5 years after decommissioning by the applicant to ensure that no erosion problems develop as a result of the disturbance, and if they do, to immediately implement erosion control measures. • All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. • All disturbed and cleared areas should be revegetated with indigenous perennial shrubs and grasses from the local area.	2	2	2	2	2	2	20	_	Low

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Biodiversity (Increased potential for alien plant Invasion)	Disturbance created during decommissioning will leave the site vulnerable to erosion and alien plant invasion for several years.	1	2	2	2	2	3	27	_	Medium	• Erosion management at the site should take place according to the Erosion Management Plan and Rehabilitation Plan (to be prepared). This should make provision for monitoring of the site for at least 3 years after decommissioning. • All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. • There should be follow-up rehabilitation and revegetation of any remaining bare areas with indigenous perennial shrubs, grasses and trees from the local area. • Alien management at the site should take place according to the Alien Invasive Management Plan. This should make provision for alien monitoring and management for at least 3 years after decommissioning. • Regular (annual) monitoring for alien plant during operation to ensure that no erosion problems have developed as result of the disturbance, as per the Alien Management Plan for the project. • Woody aliens should be controlled on at least an annual basis using the appropriate alien control techniques as determined by the species present.	1	2	1	1	2	2	14	_	Low
Geotechnical: Removal of subsoils (soil, rock)	Decommissioning of the structure will disturb the geological environment. 6) Increase in soil and wind erosion due to clearance of structures. 7) Construction and earthmoving vehicles will displace the soil. 8) Creation of drainage paths. 9) Potential oil spillages from vehicles. 10) Excessive sediments in non-perennial features.	1	4	2	1	1	3	27	_	Medium	• Use of temporary berms and drainage channels to divert surface water were feasible. • Minimize earthworks and demolish footprints. • Use of existing roads and tracks were feasible. • Rehabilitation of affected areas (such as regrassing). • Develop a chemical spill response plan. • Develop dust and demolition fly suppression plan. • Vehicle repairs to be undertaken in designated areas. • Reinstate channelized drainage features.	1	3	4	2	2	2	24	_	Low
Transportation: Additional Traffic Generation	Increase in Traffic	2	3	1	2	1	2	18	_	Low	• Ensure staff transport is done in the ‘off peak’ periods and by bus. • Stagger material, component and abnormal loads • Construction of an on-site concrete batching plant to reduce trips.	2	3	1	2	1	2	18	_	Low
Transportation: Additional Traffic Generation	Increase of Incidents with pedestrians and livestock	2	4	2	4	1	2	26	_	Medium	• Reduction in speed of vehicles • Adequate enforcement of the law • Implementation of pedestrian safety initiatives • Regular maintenance of farm fences & access cattle grids • Construction of an on-site concrete batching plant to reduce trips.	2	3	2	4	1	1	12	_	Low
Transportation: Additional Traffic Generation	Increase in Dust from gravel roads	2	3	2	2	1	2	20	_	Low	• Reduction in speed of the vehicles • Use of dust suppressant techniques • Implement a road maintenance program under the auspices of the respective transport department. • Construction of an on-site concrete batching plant to reduce trips.	2	3	2	2	1	2	20	_	Low
Transportation: Additional Traffic Generation	Increase in Road Maintenance	2	3	2	2	2	2	22	_	Low	• Implement a road maintenance program under the auspices of the respective transport department. • Construction of an on-site batching plant to reduce trips.	2	3	2	2	1	2	20	_	Low
Transportation: Abnormal Loads	Additional Abnormal Loads	3	2	1	2	1	1	9	_	Low	• Ensure abnormal vehicles travel to and from the proposed development in the ‘off peak’ periods or stagger delivery. • Adequate enforcement of the law	3	2	1	2	1	1	9	_	Low

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Transportation: Internal Access Roads	Increase in dust from gravel roads	1	4	1	1	1	1	8	_	Low	• Enforce a maximum speed limit on the development• Use of dust suppressant techniques• Adequate watering by means of water bowser.	1	3	1	1	1	2	14	_	Low
Transportation: Internal Access Roads	New/Larger Access points	1	4	1	2	1	1	9	_	Low	• Adequate road signage according to the SARTSM • Approval from the respective roads department	1	4	1	2	1	1	9	_	Low
Visual: • Potential visual intrusion resulting from vehicles and equipment involved in the decommissioning process; • Potential visual impacts of increased dust emissions from decommissioning activities and related traffic; and • Potential visual intrusion of any remaining infrastructure on the site.	• Vehicles and equipment required for decommissioning will alter the natural character of the study area and expose visual receptors to visual impacts. • Decommissioning activities may be perceived as an unwelcome visual intrusion. • Dust emissions and dust plumes from increased traffic on the gravel roads serving the decommissioning site may evoke negative sentiments from surrounding viewers. • Surface disturbance during construction would expose bare soil resulting in visual scarring of the landscape and increasing the level of visual contrast with the surrounding environment. • Temporary stockpiling of soil during decommissioning may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.	2	3	1	2	1	2	18	_	Low	• All infrastructure that is not required for post-decommissioning use should be removed. • Carefully plan to minimize the decommissioning period and avoid delays. • Maintain a neat decommissioning site by removing rubble and waste materials regularly. • Position storage / stockpile areas in unobtrusive positions in the landscape, where possible. • Ensure that dust suppression procedures are maintained on all gravel access roads throughout the decommissioning phase. • All cleared areas should be rehabilitated as soon as possible. • Rehabilitated areas should be monitored post-decommissioning and remedial actions implemented as required.	2	2	1	2	1	2	16	_	Low
Surface Water: Loss of aquatic species of special concern	During construction/decommissioning activities within watercourses could result in the disturbance or destruction of any listed and or protected plant or animal species. However none of these aquatic obligate species were observed during this assessment	1	1	1	1	1	1	5	_	Low	• Develop and implement an Aquatic Rehabilitation and Monitoring plan post Environmental Authorisation. This must be developed following the finalisation of the turbine / road layout and a walk down has been completed.	1	1	1	1	1	1	5	_	Low
Surface Water: Damage or loss of riparian and or drainage line systems i.e. disturbance of the waterbodies in the construction phase	Construction/decommissioning could result in the loss of drainage systems that are fully functional and provide an ecosystem services within the site especially where new access roads are required or road upgrades will widen any current bridges or drifts. Loss can also include a functional loss, through change in vegetation type via alien encroachment for example	2	3	2	2	3	2	24	_	Medium	• A pre-construction walkthrough with an aquatic specialist is recommended and they can assist with the development of the stormwater management plan and Aquatic Rehabilitation and Monitoring plan, coupled to micro-siting of the final layout. • All alien plant re-growth, which is currently low within the greater region must be monitored and should it occur, these plants must be eradicated within the project footprints and especially in areas near the proposed crossings. Prosopis (alien invasive riparian tree) is prevalent in areas to the north of the site, thus care in transporting any material, while ensuring that such materials is free of alien seed, coupled with pre and post alien clearing must be stipulated in the EMPr. • Where roads and crossings are upgraded, the following applies: o Existing pipe culverts must be removed and replaced with suitable sized box culverts, especially where road levels are raised to accommodate any large vehicles. o River levels, regardless of the current state of the river / water course must be reinstated thus preventing any impoundments from being formed. o The related designs must be assessed by an aquatic specialist during a pre-construction walkdown. o Where large cut and fill areas are required these must be stabilised and rehabilitated during the construction process, to minimise erosion and sedimentation. o Suitable stormwater management systems must be installed along roads and other areas and monitored during the first few months of use.	1	3	2	1	2	2	18	_	Low

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											o Any erosion / sedimentation must be resolved through whatever additional interventions maybe necessary (i.e., extension, energy dissipaters, spreaders, etc). • A detailed monitoring plan must be developed in the pre-construction phase by an aquatic specialist, where any delineated system occurs within 50 m of existing crossings.									
Surface Water: Potential impact on localised surface water quality (construction materials and fuel storage facilities) during the construction and decommissioning phases	During construction/decommissioning earthworks will expose and mobilise earth materials, and a number of materials as well as chemicals will be imported and used on site and may end up in the surface water, including soaps, oils, grease and fuels, human wastes, cementitious wastes, paints and solvents, etc. Any spills during transport or while works area conducted in proximity to a watercourse has the potential to affect the surrounding biota. Leaks or spills from storage facilities also pose a risk and due consideration to the safe design and management of the 30 000l fuel storage facility must be given. Although unlikely, consideration must also be provided for the proposed Battery Energy Storage System (BESS), with regard safe handling during the construction phase. This to avoid any spills or leaks from this system	1	3	2	2	3	3	33	–	Medium	• All liquid chemicals including fuels and oil, including the BESS must be stored in with secondary containment (bunds or containers or berms) that can contain a leak or spill. Such facilities must be inspected routinely and must have the suitable PPE and spill kits needed to contain likely worst-case scenario leak or spill in that facility, safely. • Washing and cleaning of equipment must be done in designated wash bays, where rinse water is contained in evaporation/sedimentation ponds (to capture oils, grease cement and sediment). Mechanical plant and bowsers must not be refuelled or serviced within 100m of a river channel. • All construction camps, lay down areas, wash bays, batching plants or areas and any stores should be more than 50 m from any demarcated water courses. Note comment regards Camp A that requires micro-siting. • Littering and contamination associated with construction activity must be avoided through effective construction camp management; • No stockpiling should take place within or near a water course • All stockpiles must be protected and located in flat areas where run-off will be minimised and sediment recoverable;	1	3	2	1	2	2	18	–	Low
Socio-Economic	Considering a time period of 20 years prior to decommissioning and the dynamics of social variables, it would be rather meaningless to attach assessment criteria to decommissioning at this point due to the high level of uncertainty such assessment would be based upon.																			
Cumulative																				
Archaeological Impacts: Heritage resources	(2) The extent that the addition of this project will have on the overall impact of developments in the region on heritage resources.	4	2	4	4	4	2	36	–	Medium	It can clearly be noted that the area in general is abundant with Stone Age and historical remains. However, until a regional detailed study is commissioned by HWC or SAHRA. No further mitigations measures can be proposed other than those already recommended for the site-specific mitigation of sites in this report.	4	1	4	4	4	1	17	–	Low

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Avifauna	(5) Displacement of priority species due to habitat destruction in the substation footprint (6) Displacement of priority species due to disturbance associated with the construction activities. (7) Mortality of priority species due to collisions with the 132kV OHL. (8) Displacement of priority species due to disturbance associated with the decommissioning activities.	2	4	3	3	3	3	45	-	High	• A site-specific Construction Environmental Management Programme (CEMPr) must be implemented, which gives appropriate and detailed description of how construction activities must be conducted to reduce unnecessary destruction and degradation of habitat. All contractors are to adhere to the CEMPr and should apply good environmental practice during construction. • The minimum footprint areas for infrastructure should be used. • Following construction, rehabilitation of all areas disturbed (e.g. temporary access tracks) must be undertaken and to this end a habitat restoration plan is to be developed by a rehabilitation specialist and implemented accordingly. • An avifaunal specialist must conduct a site walk through of final pole positions prior to construction to determine where BFDs are required. • BFDs must be installed as per the instructions of the specialist following the walk through. • The operational monitoring programme must include regular monitoring (i.e. quarterly) of the powerlines for collision mortalities. • If additional collision hot-spots are identified during quarterly monitoring, these sections must be marked with BFDs to reduce the collision risk. • No off-road driving should be allowed. • Existing roads should be used as much as possible. • Measures to control noise must be implemented according to industry best practice • Access to the rest of the property must be restricted • If Corridor Option 3 was utilised, no dismantling activities within 2km of the Martial Eagle nest on Tower 108 of the Droërivier Proteus 1 400kV line should take place in the period May to November, which is the breeding season for the birds.	2	3	3	3	3	2	28	_	Medium
Biodiversity: Cumulative impacts on fauna and flora	Wind energy development in the wider area around the Koup 1 site will generate cumulative impacts on habitat loss and fragmentation for fauna and flora.	2	3	2	2	3	2	24	-	Medium	• There should be no infrastructure within the Very High Sensitivity areas. • The footprint within drainage lines should be minimized as much as possible. • Preconstruction walk-though of the approved development footprint to ensure that sensitive habitats and species are avoided where possible. • Ensure that lay-down and other temporary infrastructure is within low sensitivity areas, preferably previously transformed areas if possible. • Minimise the development footprint as far as possible and rehabilitate disturbed areas that are no longer required by the operational phase of the development. • A large proportion of the impact of the development stems from the access roads and the number of roads should be reduced to the minimum possible and routes should also be adjusted to avoid areas of high sensitivity as far as possible, as informed by a preconstruction walk-though survey. • Preconstruction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes topics such as no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimizing wildlife interactions, remaining within demarcated construction areas etc. • Demarcate all areas to be cleared with construction tape or other appropriate and effective means. However, caution should be exercised to avoid using material that might entangle fauna.	2	2	2	2	3	2	22	_	Low
Geotechnical: Removal of subsoils	None	0	0	0	0	0	0	0	-		None	0	0	0	0	0	0	0	_	
Transportation: Additional Traffic Generation	Increase in Traffic	2	3	1	2	1	4	36	_	Medium	• Ensure a large portion of vehicles traveling to and from the proposed development travels in the 'off peak' periods or by bus. • Construction of an on-site batching plant to reduce trips. • Coordination between all developers in the area	2	3	1	2	1	2	18	_	Low

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Transportation: Additional Traffic Generation	Increase of Incidents with pedestrians and livestock	2	4	2	4	1	4	52	_	High	• Reduction in speed of vehicles • Adequate enforcement of the law • Implementation of pedestrian safety initiatives • Regular maintenance of farm fences, access cattle grids • Construction of an on-site batching plant to reduce trips. • Coordination between all developers in the area	2	3	2	4	1	2	24	_	Medium
Transportation: Additional Traffic Generation	Increase in Dust from gravel roads	2	3	2	2	1	4	40	_	Medium	• Reduction in speed of the vehicles • Use of dust suppressant techniques • Implement a road maintenance program under the auspices of the respective transport department. • Construction of an on-site batching plant to reduce trips. • Coordination between all developers in the area	2	3	2	2	1	2	20	_	Low
Transportation: Additional Traffic Generation	Increase in Road Maintenance	2	3	2	2	2	2	22	_	Low	• Implement a road maintenance program under the auspices of the respective transport department. • Construction of an on-site batching plant to reduce trips. • Coordination between all developers in the area	2	3	2	2	2	2	22	_	Low
Transportation: Abnormal Loads	Additional Abnormal Loads	3	2	1	2	1	4	36	_	Medium	• Ensure abnormal vehicles travel to and from the proposed development in the ‘off peak’ periods. • Adequate enforcement of the law	3	2	1	2	1	2	18	_	Low
Transportation: Internal Access Roads	Increase in dust from gravel roads	1	4	1	1	1	3	24	_	Medium	• Enforce a maximum speed limit on the development • Use of dust suppressant techniques • Adequate watering by means of water bowser	1	3	1	1	1	2	14	_	Low
Transportation: Internal Access Roads	New/Larger Access points	1	4	1	2	1	2	18	_	Low	• Adequate road signage according to the SARTSM Approval from the respective roads department	1	4	1	2	1	1	9	_	Low
Visual: • Potential alteration of the visual character and sense of place in the broader area. • Potential visual impact on receptors in the study area. • Potential impact on the night time visual environment.	• Additional renewable energy and associated infrastructure developments in the broader area will alter the natural character of the study area towards a more industrial landscape and expose a greater number of receptors to visual impacts. • Visual intrusion of multiple renewable energy and infrastructure developments may be exacerbated, particularly in more natural undisturbed settings. • Additional renewable energy facilities in the area would generate additional traffic on gravel roads thus resulting in increased impacts from dust emissions and dust plumes. • The night time visual environment could be altered as a result of operational and security lighting at multiple renewable energy facilities in the broader area.	3	3	2	3	3	2	28	_	Medium	• Where possible, limit the number of maintenance vehicles using access roads. • Non-reflective surfaces should be utilised where possible. • Where possible, limit the amount of security and operational lighting present at the on-site substation. • Light fittings for security at night should reflect the light toward the ground and prevent light spill.	3	3	2	2	2	2	24	_	Medium

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATU	S		E	P	R	L	D	I / M	TOTAL	STATU	S
Surface Water: Impact of various proposed wind farms and associated grid lines on the local aquatic resources	The cumulative assessment considers the various proposed renewable projects that occur within a 35km radius of this site, where the author has either been involved in the assessment of these projects (Enertrag SA) and or review of the past assessments as part of any required Water Use Licenses (Atlantic Energy Partners & Mainstream projects).	1	1	1	1	1	1	5	_	Low	The premise of all the reviewed or assessed projects has been the avoidance of impacts on the aquatic environment, which have been achieved by the various proposed layouts. The only remaining impacts will be the crossing of internal roads over minor watercourse / drainage lines.	1	1	1	1	1	1	5	_	Low
Socio-Economic: Health and social wellbeing	Noise	1	3	2	2	3	2	22	_	Low	With regard to the cumulative impacts, mitigation can only be considered and implemented through a readiness action plan at a regional level and will need to be driven on a provincial and municipal basis; underpinned by national government, private sector and public support. In this regard the Draft Consolidated Intergovernmental Readiness Report for large development scenarios in the Central Karoo (Western Cape Government Environmental Affairs and Development Planning, 2019) acknowledges the need to prepare for large-scale, or regional, development proposals and to enlist national government, private sector and public participation.	1	3	2	2	3	2	22	_	Low
Socio-Economic: Health and social wellbeing	Shadow Flicker	1	3	2	2	3	2	22	_	Low		1	3	2	2	3	2	22	_	Low
Socio-Economic: Health and social wellbeing	Blade glint	2	3	2	2	3	2	24	_	Medium		2	3	1	2	3	2	22	_	Low
Socio-Economic: Health and social wellbeing	Risk of HIV and AIDS	4	3	4	3	4	3	54	_	High		2	3	3	3	3	3	42	_	Medium
Socio-Economic: Quality of the living environment	Sense of place	2	4	4	3	4	3	51	_	High		2	4	4	3	4	3	51	_	High
Socio-Economic: Quality of the living environment	Service supplies and infrastructure	2	3	2	2	2	2	22	_	Low		2	2	2	2	2	2	20	_	Low
Socio-Economic: Economic	Job creation and skills development	4	4	3	3	3	4	68	+	Very High		4	4	3	3	3	4	68	+	Very High
Socio-Economic: Economic	Socio-economic stimulation.	2	4	2	2	3	2	26	+	Medium		2	4	2	2	3	2	26	+	Medium
Palaeontological: Fossil heritage resources	Disturbance, damage or destruction of fossils at or beneath the ground surface due to surface clearance and bedrock excavations	1	4	4	3	4	2	32	-	Medium	(N.B. Vary between projects) • Pre-construction walk down (with fossil recording / collection) of final footprint by specialist palaeontologist. • Chance Fossil Finds Procedure during construction phase.	1	2	4	2	4	1	13	-	Low
Cultural: Ecological	Inappropriate cumulative development degrade the significant ecological elements of the cultural landscape	3	4	4	3	4	4	72	-	Very High	In addition to the proposed recommendations of this CLA the cumulative negative impact of the proposed WEFs on the cultural landscape can be reduced with the following recommendations on WEF development for the regional cultural landscape.	3	2	3	2	3	2	26	-	Medium

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATU	S		E	P	R	L	D	I / M	TOTAL	STATU	S
Cultural: Aesthetic	Inappropriate cumulative development degrades the significant aesthetic elements of the cultural landscape altering the character and sense of place	3	4	4	3	3	4	68	-	Very High	To reduce the negative cumulative impact of the proposed WEFs on the N12 scenic route and the character and sense of place of the cultural landscape of the Koup region, it is recommended that WEF turbines be constructed either to the west or east of the N12 and not on either side along the same stretch of N12. The WEFs should read as separate developments with vast spaces in between to continue the reading on the landscape of places amongst the vastness as is the historical trend of farmsteads in the Koup region. Following the existing natural ridgelines that run east to west may reduce the impact of the cumulative WEF developments on the cultural landscape as the turbines, although out of scale and form with the surrounding area due to their verticality, may follow the skyline and break the views where they have historically been reduced already by the height of the ridges. The turbines, if placed sensitively and far away enough from the N12 and not on the ridgeline or steep slopes, so as not to feel overwhelming, can emphasise the experience of the poort elements of the cultural landscape if placed to follow the natural undulating landform. These recommendations should allow for the continued opportunity by travellers to experience the vistas of the vast open wilderness spaces and views of the mountain ranges in the distance at all points along the N12 scenic drive. NOTE: If the recommendations in this CLA are applied to the majority of the surrounding RE developments, impacts can be reduced to ratings given in this table. With no specialist CLA reports done on the surrounding applications, cumulative impact on the cultural landscape of the region has not been considered and cannot be included in this rating.	3	4	4	2	3	3	42	-	Medium
Cultural: Historic	Inappropriate cumulative development degrades the significant historic elements of the cultural landscape altering the character and sense of place	3	4	4	4	4	4	76	-	Very High		3	2	3	2	3	2	26	-	Medium
Cultural: Socio-economic	Inappropriate cumulative development degrade the significant socio-economic opportunities of the cultural landscape	3	4	3	4	4	4	72	-	Very High		3	3	1	1	4	2	24	+	Medium
No-Go																				
Surface Water: Combined impact on aquatic resources	Should the project not proceed, then current status quo with regard the aquatic environment would remain unchanged. Overall, these catchment and subsequent rivers / watercourses are largely in a natural state. But present day impacts do occur in localised areas and included the following: • Erosion as a result of road crossings; • Several farm dams; and • Undersized culverts within present day road crossings. This has resulted in a slow degradation within the wetland and aquatic systems but the rate in change is not noticeable within the timeframe of this assessment. These activities are likely to continue intermitted into the future and	1	3	2	1	2	2	18	_	Low	Improve the current stormwater and energy dissipation features not currently found along the tracks and roads within the region Install properly sized culverts with erosion protection measures at the present road / track crossings	1	3	2	1	2	2	18	_	Low
Socio-Economic: The project does not proceed.	The status quo remains in place. No positive or negative impacts occur	4	4	2	4	3	3	51	_	High	The only mitigation measure would be to proceed with the project which would revise the negative impact to positive.								_	
Palaeontological: Fossil heritage resources	Disturbance, damage or destruction of fossils at or beneath the ground surface due to natural weathering and erosion	1	4	4	2	4	1	15	-	Low	NA									NA

16. POSITIVE AND NEGATIVE IMPACTS OF THE KOUP 1 GRID PROJECT

A summary of the impacts pre-mitigation and post-mitigation are provided below:

Table 20: Summary of impacts pre-mitigation and post-mitigation

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST MITIGATION
Planning Phase			
Archaeological	Damage to two historical farmsteads/structures (Kh001 and Kh001b) which are located within the proposed grid corridor area.	Medium Negative Impact	Low Negative Impact
Archaeological	Due to the size of the area assessed, there's a possibility of encountering unidentified heritage features in un-surveyed areas does exist.	Medium Negative Impact	Low Negative Impact
Cultural: Ecological	Inappropriate infrastructure layout planning degrades ecological elements of the cultural landscape.	Medium Negative Impact	Low Negative Impact
Cultural: Aesthetic	Inappropriate infrastructure layout planning negates aesthetic and sense of place requirements of the cultural landscape.	High Negative Impact	Medium Negative Impact
Cultural: Historic	Inappropriate infrastructure layout planning degrades historic elements of the cultural landscape.	Medium Negative Impact	Low
Cultural: Socio-economic	Non-landowner residents' lack of representation in planning and public participation process leads to loss of local knowledge, socio-economic empowerment and character of the cultural landscape.	Medium Negative Impact	Low Negative Impact
Construction Phase			
Avifauna	Displacement of priority species due to habitat destruction in the substation footprint	Low Negative Impact	Low Negative Impact
Avifauna	Displacement of priority species due to disturbance associated with the construction activities	Medium Negative Impact	Low Negative Impact
Cultural: Ecological	Fragmentation and destruction of the landscape degrading the environment and thus continuous relationship between man and environment	High Negative Impact	Low Negative Impact
Cultural: Aesthetic	Gridline infrastructure construction and decommissioning activity degrades the character of the cultural landscape and the sense of place	High Negative Impact	Medium Negative Impact
Cultural: Historic	Integrity of farmsteads and farm roads degraded by insensitive construction or decommissioning activities.	High Negative Impact	Low Negative Impact
Cultural: Socio-economic	Integrity of local residents to continue their patterns of land use is degraded by the construction and decommissioning activities.	Very High Negative Impact	Low Positive Impact

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST MITIGATION
Biodiversity: Vegetation	Vegetation clearing for access roads, turbines and their service areas and other infrastructure will impact on vegetation and protected plant species.	Medium Negative Impact	Low Negative Impact
Biodiversity: Fauna	Disturbance, transformation and loss of habitat will have a negative effect on resident fauna during construction. Due to noise and operation of heavy machinery, faunal disturbance will extend well beyond the footprint and extend into adjacent areas. This will however be transient and restricted to the construction phase.	Medium Negative Impact	Low Negative Impact
Geotechnical: Removal of subsoils (soil, rock)	Displacement of natural earth material and overlying vegetation. 15) Increase stormwater velocity. 16) Increase in soil and wind erosion due to clearing of vegetation. 17) Construction and earthmoving vehicles may displace soil during operations. 18) Creation of drainage paths along access tracks. 19) Potential oil spillages from heavy plant. 20) Sedimentation of non-perennial features and excessive dust. 21) Potential groundwater and drainage feature contamination.	Low Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase in Traffic	Low Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase of Incidents with pedestrians and livestock	Medium Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase in Dust from gravel roads	Low Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase in Road Maintenance	Low Negative Impact	Low Negative Impact
Transportation: Abnormal Loads	Additional Abnormal Loads	Low Negative Impact	Low Negative Impact
Transportation: Access Roads	Increase in dust from gravel roads	Low Negative Impact	Low Negative Impact
Transportation: Access Roads	New/Larger Access points	Low Negative Impact	Low Negative Impact

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST MITIGATION
Visual: 5. Potential alteration of the visual character and sense of place. 6. Potential visual impact on receptors in the study area	• Large construction vehicles, equipment and construction material stockpiles will alter the natural character of the study area and expose visual receptors to impacts associated with construction. • Construction activities may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings. • Dust emissions and dust plumes from increased traffic on gravel roads serving the construction site may evoke negative sentiments from surrounding viewers. • Surface disturbance during construction would expose bare soil resulting in visual scarring of the landscape and increasing the level of visual contrast with the surrounding environment. • Vegetation clearance required for the construction of the proposed substation is expected to increase dust emissions and alter the natural character of the surrounding area, thus creating a visual impact. • Temporary stockpiling of soil during construction may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.	Low Negative Impact	Low Negative Impact
Surface Water: Loss of aquatic species of special concern	During construction activities within watercourses could result in the disturbance or destruction of any listed and or protected plant or animal species. However none of these aquatic obligate species were observed during this assessment	Low Negative Impact	Low Negative Impact
Surface Water: Damage or loss of riparian and or drainage line systems i.e. disturbance of the waterbodies in the construction phase	Construction could result in the loss of drainage systems that are fully functional and provide an ecosystem services within the site especially where new access roads are required or road upgrades will widen any current bridges or drifts. Loss can also include a functional loss, through change in vegetation type via alien encroachment for example	Medium Negative Impact	Low Negative Impact
Surface Water: Potential impact on localised surface water quality (construction materials and fuel storage facilities) during the construction and decommissioning phases	During construction earthworks will expose and mobilise earth materials, and a number of materials as well as chemicals will be imported and used on site and may end up in the surface water, including soaps, oils, grease and fuels, human wastes, cementitious wastes, paints and solvents, etc. Any spills during transport or while works area conducted in proximity to a watercourse has the potential to affect the surrounding biota. Leaks or spills from storage facilities also pose a risk and due consideration to the safe design and management of the 30 000l fuel storage facility must be given. Although unlikely, consideration must also be provided for the proposed Battery Energy Storage System (BESS), with regard safe handling during the construction phase. This to avoid any spills or leaks from this system	Medium Negative Impact	Low Negative Impact
Socio-Economic: Health and social wellbeing	Air Quality	Low Negative Impact	Low Negative Impact
Socio-Economic: Health and social wellbeing	Noise	Low Negative Impact	Low Negative Impact
Socio-Economic: Health and social wellbeing	Increase in crime	Low Negative Impact	Low Negative Impact

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST MITIGATION
Socio-Economic: Health and social wellbeing	Increased risk of HIV infections	High Negative Impact	Medium Negative Impact
Socio-Economic: Health and social wellbeing	Influx of construction workers	Low Negative Impact	Low Negative Impact
Socio-Economic: Health and social wellbeing	Hazard Exposure	Low Negative Impact	Low Negative Impact
Socio-Economic: Quality of the living environment	Disruption of daily living patterns	Low Negative Impact	Low Negative Impact
Socio-Economic: Quality of the living environment	Disruptions to social and community infrastructure	Low Negative Impact	Low Negative Impact
Socio-Economic: Economic	Job creation and skills development	Medium Positive Impact	Medium Positive Impact
Socio-Economic: Economic	Socio-economic stimulation.	Medium Positive Impact	Medium Positive Impact
Palaeontological: Fossil heritage resources	Disturbance, damage or destruction of fossils at or beneath the ground surface due to surface clearance and bedrock excavations	Medium Negative Impact	Low Negative Impact
Operational Phase			
Avifauna	Mortality of priority species due to collisions with the 132kV OHL	Medium Negative Impact	Medium Negative Impact
Cultural: Ecological	Inappropriate operational activities degrade the significant ecological elements of the cultural landscape	High Negative Impact	Low Negative Impact
Cultural: Aesthetic	Inappropriate operational activities degrade the significant aesthetic elements of the cultural landscape altering the character and sense of place	High Negative Impact	Medium Negative Impact
Cultural: Historic	Inappropriate operational activities degrade the significant historic elements of the cultural landscape altering the character and sense of place	Very High Negative Impact	Medium Negative Impact
Cultural: Socio-economic	Inappropriate operational activities degrade the significant socio-economic opportunities of the cultural landscape	Very High Negative Impact	Medium Positive Impact
Biodiversity (Fauna)	Faunal disturbance and habitat degradation .The operation and presence of the power line may lead to disturbance or persecution of fauna during maintenance activities.	Low Negative Impact	Low Negative Impact
Biodiversity (Increased potential for soil erosion)	Disturbance created during construction will leave the site and its immediate surroundings vulnerable to erosion and alien plant invasion for several years into the operational phase	Medium Negative Impact	Low Negative Impact

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST MITIGATION
Biodiversity (Vegetation)	Ecological degradation due to alien plant invasion	Medium Negative Impact	Low Negative Impact
Biodiversity (Negative impact on ESAs, CBAs and broad-scale ecological processes).	Transformation and presence of the grid connection and associated infrastructure will contribute to cumulative habitat loss within CBAs, ESAs and impact on broad-scale ecological processes such as fragmentation.	Medium Negative Impact	Low Negative Impact
Geotechnical: Removal of subsoils (soil, rock)	Displacement of natural earth material. 1) Increase in soil erosion. 2) Potential oil spillages from maintenance vehicles. 3) Sedimentation of non-perennial features caused by soil erosion.	Low Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase in Traffic	Low Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase of Incidents with pedestrians and livestock	Low Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase in Dust from gravel roads	Low Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase in Road Maintenance	Low Negative Impact	Low Negative Impact
Transportation: Abnormal Loads	Additional Abnormal Loads	Low Negative Impact	Low Negative Impact
Transportation: Internal Access Roads	New/Larger Access points	Low Negative Impact	Low Negative Impact
Visual: • Potential alteration of the visual character and sense of place. • Potential visual impact on receptors in the study area.	• The proposed power line and substation could alter the visual character of the surrounding area and expose sensitive visual receptor locations to visual impacts. • The development may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings. • Dust emissions and dust plumes from maintenance vehicles accessing the site via gravel roads may evoke negative sentiments from surrounding viewers. • The night time visual environment could be altered as a result of operational and security lighting at the proposed substation.	Low Negative Impact	Low Negative Impact
Surface Water: Impact on aquatic systems through the possible increase in surface water runoff on form and function during the operational phase	Increase in hard surface areas, and roads that require stormwater management will increase through the concentration of surface water flows that could result in localised changes to flows (volume) that would result in form and function changes within aquatic systems, which are currently ephemeral. This then increases the rate of erosions and sedimentation of downstream areas.	Medium Negative Impact	Low Negative Impact
Socio-Economic: Health and social wellbeing	Electromagnetic field and RF interference	Low Negative Impact	Low Negative Impact

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST MITIGATION
Socio-Economic: Health and social wellbeing	Hazard exposure	Low Negative Impact	Low Negative Impact
Socio-Economic: Quality of the living environment	Transformation of the sense of place	High Negative Impact	High Negative Impact
Socio-Economic: Economic	Job creation and skills development	Medium Positive Impact	Medium Positive Impact
Socio-Economic: Economic	Socio-economic stimulation.	Medium Positive Impact	Medium Positive Impact
Decommissioning Phase			
Avifauna	Displacement due to disturbance associated with the dismantling of the grid connection.	Low Negative Impact	Low Negative Impact
Cultural: Ecological	Fragmentation and destruction of the landscape degrading the environment and thus continuous relationship between man and environment	High Negative Impact	Low Negative Impact
Cultural: Aesthetic	Gridline infrastructure construction and decommissioning activity degrades the character of the cultural landscape and the sense of place	High Negative Impact	Medium Negative Impact
Cultural: Historic	Integrity of farmsteads and farm roads degraded by insensitive construction or decommissioning activities.	High Negative Impact	Low Negative Impact
Cultural: Socio-economic	Integrity of local residents to continue their patterns of land use is degraded by the construction and decommissioning activities.	Very High Negative Impact	Low Positive Impact
Biodiversity (Fauna)	Due to disturbance, noise and the operation of heavy machinery, faunal disturbance due to decommissioning will extend beyond the footprint and impact adjacent areas to some degree. This will however be transient and restricted to the period while machinery is operational. In the long term, decommissioning should restore the ecological functioning and at least some habitat value to the affected areas.	Low Negative Impact	Low Negative Impact
Biodiversity (Increased potential for soil erosion)	Following decommissioning, the site will be highly vulnerable to soil erosion due to the disturbance created by the removal of infrastructure from the site.	Medium Negative Impact	Low Negative Impact
Biodiversity (Increased potential for alien plant Invasion)	Disturbance created during decommissioning will leave the site vulnerable to erosion and alien plant invasion for several years.	Medium Negative Impact	Low Negative Impact
Geotechnical: Removal of subsoils (soil, rock)	Decommissioning of the structure will disturb the geological environment. 11) Increase in soil and wind erosion due to clearance of structures. 12) Construction and earthmoving vehicles will displace the soil. 13) Creation of drainage paths. 14) Potential oil spillages from vehicles.	Medium Negative Impact	Low Negative Impact

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST MITIGATION
	15) Excessive sediments in non-perennial features.		
Transportation: Additional Traffic Generation	Increase in Traffic	Low Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase of Incidents with pedestrians and livestock	Medium Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase in Dust from gravel roads	Low Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase in Road Maintenance	Low Negative Impact	Low Negative Impact
Transportation: Abnormal Loads	Additional Abnormal Loads	Low Negative Impact	Low Negative Impact
Transportation: Internal Access Roads	Increase in dust from gravel roads	Low Negative Impact	Low Negative Impact
Transportation: Internal Access Roads	New/Larger Access points	Low Negative Impact	Low Negative Impact
Visual: • Potential visual intrusion resulting from vehicles and equipment involved in the decommissioning process; • Potential visual impacts of increased dust emissions from decommissioning activities and related traffic; and • Potential visual intrusion of any remaining infrastructure on the site.	• Vehicles and equipment required for decommissioning will alter the natural character of the study area and expose visual receptors to visual impacts. • Decommissioning activities may be perceived as an unwelcome visual intrusion. • Dust emissions and dust plumes from increased traffic on the gravel roads serving the decommissioning site may evoke negative sentiments from surrounding viewers. • Surface disturbance during construction would expose bare soil resulting in visual scarring of the landscape and increasing the level of visual contrast with the surrounding environment. • Temporary stockpiling of soil during decommissioning may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.	Low Negative Impact	Low Negative Impact
Surface Water: Loss of aquatic species of special concern	During construction/decommissioning activities within watercourses could result in the disturbance or destruction of any listed and or protected plant or animal species. However none of these aquatic obligate species were observed during this assessment	Low Negative Impact	Low Negative Impact

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST MITIGATION
Surface Water: Damage or loss of riparian and or drainage line systems i.e. disturbance of the waterbodies in the construction phase	Construction/decommissioning could result in the loss of drainage systems that are fully functional and provide an ecosystem services within the site especially where new access roads are required or road upgrades will widen any current bridges or drifts. Loss can also include a functional loss, through change in vegetation type via alien encroachment for example	Medium Negative Impact	Low Negative Impact
Surface Water: Potential impact on localised surface water quality (construction materials and fuel storage facilities) during the construction and decommissioning phases	During construction/decommissioning earthworks will expose and mobilise earth materials, and a number of materials as well as chemicals will be imported and used on site and may end up in the surface water, including soaps, oils, grease and fuels, human wastes, cementitious wastes, paints and solvents, etc. Any spills during transport or while works area conducted in proximity to a watercourse has the potential to affect the surrounding biota. Leaks or spills from storage facilities also pose a risk and due consideration to the safe design and management of the 30 000l fuel storage facility must be given. Although unlikely, consideration must also be provided for the proposed Battery Energy Storage System (BESS), with regard safe handling during the construction phase. This to avoid any spills or leaks from this system	Medium Negative Impact	Low Negative Impact
Socio-Economic	Considering a time period of 20 years prior to decommissioning and the dynamics of social variables, it would be rather meaningless to attach assessment criteria to decommissioning at this point due to the high level of uncertainty such assessment would be based upon.		
Cumulative			
Archaeological Impacts: Heritage resources	(3) The extent that the addition of this project will have on the overall impact of developments in the region on heritage resources.	Medium Negative Impact	Low Negative Impact
Avifauna	(9) Displacement of priority species due to habitat destruction in the substation footprint (10) Displacement of priority species due to disturbance associated with the construction activities. (11) Mortality of priority species due to collisions with the 132kV OHL. (12) Displacement of priority species due to disturbance associated with the decommissioning activities.	High Negative Impact	Medium Negative Impact
Biodiversity: Cumulative impacts on fauna and flora	Wind energy development in the wider area around the Koup 1 site will generate cumulative impacts on habitat loss and fragmentation for fauna and flora.	Medium Negative Impact	Low Negative Impact
Geotechnical: Removal of subsoils	None		
Transportation: Additional Traffic Generation	Increase in Traffic	Medium Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase of Incidents with pedestrians and livestock	High Negative Impact	Medium Negative Impact

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST MITIGATION
Transportation: Additional Traffic Generation	Increase in Dust from gravel roads	Medium Negative Impact	Low Negative Impact
Transportation: Additional Traffic Generation	Increase in Road Maintenance	Low Negative Impact	Low Negative Impact
Transportation: Abnormal Loads	Additional Abnormal Loads	Medium Negative Impact	Low Negative Impact
Transportation: Internal Access Roads	Increase in dust from gravel roads	Medium Negative Impact	Low Negative Impact
Transportation: Internal Access Roads	New/Larger Access points	Low Negative Impact	Low Negative Impact
Visual: • Potential alteration of the visual character and sense of place in the broader area. • Potential visual impact on receptors in the study area. • Potential impact on the night time visual environment.	• Additional renewable energy and associated infrastructure developments in the broader area will alter the natural character of the study area towards a more industrial landscape and expose a greater number of receptors to visual impacts. • Visual intrusion of multiple renewable energy and infrastructure developments may be exacerbated, particularly in more natural undisturbed settings. • Additional renewable energy facilities in the area would generate additional traffic on gravel roads thus resulting in increased impacts from dust emissions and dust plumes. • The night time visual environment could be altered as a result of operational and security lighting at multiple renewable energy facilities in the broader area.	Medium Negative Impact	Medium Negative Impact
Surface Water: Impact of various proposed wind farms and associated grid lines on the local aquatic resources	The cumulative assessment considers the various proposed renewable projects that occur within a 35km radius of this site, where the author has either been involved in the assessment of these projects (Enertrag SA) and or review of the past assessments as part of any required Water Use Licenses (Atlantic Energy Partners & Mainstream projects).	Low Negative Impact	Low Negative Impact
Socio-Economic: Health and social wellbeing	Noise	Low Negative Impact	Low Negative Impact
Socio-Economic: Health and social wellbeing	Shadow Flicker	Low Negative Impact	Low Negative Impact
Socio-Economic: Health and social wellbeing	Blade glint	Medium Negative Impact	Low Negative Impact
Socio-Economic: Health and social wellbeing	Risk of HIV and AIDS	High Negative Impact	Medium Negative Impact
Socio-Economic: Quality of the living environment	Sense of place	High Negative Impact	High Negative Impact
Socio-Economic: Quality of the living environment	Service supplies and infrastructure	Low Negative Impact	Low Negative Impact

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	PRE-MITIGATION	POST MITIGATION
Socio-Economic: Economic	Job creation and skills development	Medium Positive Impact	Medium Positive Impact
Socio-Economic: Economic	Socio-economic stimulation.	Very High Positive Impact	Very High Positive Impact
Palaeontological: Fossil heritage resources	Disturbance, damage or destruction of fossils at or beneath the ground surface due to surface clearance and bedrock excavations	Medium Negative Impact	Low Negative Impact
Cultural: Ecological	Inappropriate cumulative development degrade the significant ecological elements of the cultural landscape	Very High Negative Impact	Medium Negative Impact
Cultural: Aesthetic	Inappropriate cumulative development degrades the significant aesthetic elements of the cultural landscape altering the character and sense of place	Very High Negative Impact	Medium Negative Impact
Cultural: Historic	Inappropriate cumulative development degrades the significant historic elements of the cultural landscape altering the character and sense of place	Very High Negative Impact	Medium Negative Impact
Cultural: Socio-economic	Inappropriate cumulative development degrade the significant socio-economic opportunities of the cultural landscape	Very High Negative Impact	Medium Positive Impact
No-Go			
Surface Water: Combined impact on aquatic resources	Overall, these catchment and subsequent rivers / watercourses are largely in a natural state. But present day impacts do occur in localised areas and included the following: • Erosion as a result of road crossings; • Several farm dams; and • Undersized culverts within present day road crossings. This has resulted in a slow degradation within the wetland and aquatic systems but the rate in change is not noticeable within the timeframe of this assessment. These activities are likely to continue intermitted into the future.	Low Negative Impact	Low Negative Impact
Socio-Economic: The project does not proceed.	The status quo remains in place. No positive or negative impacts occur	High Negative Impact	NA
Palaeontological: Fossil heritage resources	Disturbance, damage or destruction of fossils at or beneath the ground surface due to natural weathering and erosion	Low Negative Impact	NA

16.1 Mitigation measures

Refer to section 14 above. The assessment of each issue/impact is included in Section 14 above and mitigation measures are provided for each impact identified in **Table 19**.

17. SUMMARY OF SPECIALIST FINDINGS AND RECOMMENDATIONS

Table 21: Summary of specialist findings and recommendations

Specialist Study	Findings	Recommendations
Agricultural Assessment	The site has low agricultural potential because of, predominantly, rainfall constraints, but also due to soil constraints. It is totally unsuitable for cultivation, and agricultural land use is limited to low density grazing. The land is predominantly of low agricultural sensitivity. Three potential negative agricultural impacts were identified, loss of agricultural land use, land degradation, and the impact of dust. One positive agricultural impact was identified, namely increased financial security for farming operations. All of the impacts are of low significance. The proposed development will not have an unacceptable negative impact on the agricultural production capability of the site. The proposed development is therefore acceptable. This is substantiated by the facts that the land is of very low agricultural potential, the amount of agricultural land loss is well within the allowable development limits, the proposed development poses a low risk in terms of causing soil degradation, and the development offers some positive impact on agriculture as well as wider, societal benefits.	The recommended mitigation measures are implementation of an effective system of storm water run-off control; maintenance of vegetation cover; and stripping, stockpiling and re-spreading of topsoil. From an agricultural impact point of view, it is recommended that the development be approved. The conclusion of this assessment on the acceptability of the proposed development and the recommendation for its approval is not subject to any conditions.
Avifaunal Assessment	The proposed Koup 1 WEF grid connection will have several potential impacts on priority avifauna. These impacts are the following: • Displacement of priority species due to disturbance linked to construction activities in the construction phase. • Displacement due to habitat transformation in the construction phase. • Collisions with the overhead line in the operational phase.	The proposed Koup 1 WEF grid connection will have a moderate impact on avifauna which, in most instances, could be reduced to a low impact through appropriate mitigation. None of the proposed corridor options are fatally flawed, but Corridor Option 1 is preferred, followed by Option 2 and Option 3 in that order. The development is therefore supported,

Specialist Study	Findings	Recommendations
	• Displacement of priority species due to disturbance linked to dismantling activities in the decommissioning phase.	provided the mitigation measures listed in this report are strictly implemented.
Biodiversity Assessment	The Koup 1 site falls entirely within the Gamka Karoo vegetation type and consists of open gravel plains and low hills dissected by numerous drainage lines. Vegetation cover is generally very low and dominated by low shrubs and scattered low trees. In general, the vegetation of the Koup 1 site is considered low sensitivity and there are few species of concern present. In terms of fauna, the diversity of mammals, reptiles and amphibians is considered relatively low, even by Karoo standards. Although the site falls within the broad distribution of the Riverine Rabbit, the drainage lines of the site do not have extensive floodplains with dense riparian vegetation that represent the typical habitat of this species in the area. The Koup 1 site is therefore considered unsuitable for this species and the development is considered highly unlikely to have any impact on the Riverine Rabbit. The site also falls within the range of the Karoo Padloper and if present it would be associated with the hills of the site with sufficient loose rock and coarse rubble to provide shelter. The low vegetation cover and paucity of such habitat suggests that the site is not an important area for this species and no evidence of this species was observed on the site. While the smaller drainage features of the site are classified as Ecological Support Areas, there is only one small area of CBA in the east of the site that would be minimally impacted by the development. As such impacts on CBAs are considered acceptable for the wind farm. Similarly, for the grid connection, there are two CBAs that project minimally into the grid corridor and would potentially be affected by the development. However, the majority of the CBAs can be avoided and the footprint within the remaining areas of CBA that cannot be avoided would be minimal and a significant impact on CBAs as a result of the grid connection is unlikely. In terms of cumulative impacts, the wider area currently has a low development impact from renewable energy and the	There are no impacts associated with the Koup 1 Grid Connection Option 2 and associated infrastructure that cannot be mitigated to an acceptable level. With the application of relatively simple mitigation and avoidance measures, the impact of the Koup 1 Grid Connection on the local environment can be reduced to a low and acceptable magnitude. The contribution of the Koup 1 Grid Connection development to cumulative impact in the area would be low and is considered acceptable. Overall, there are no specific long-term impacts likely to be associated with the development of the Koup 1 grid connection hat cannot be reduced to a low significance. As such, there are no fatal flaws associated with the development and no terrestrial ecological considerations that should prevent it from proceeding.

Specialist Study	Findings	Recommendations
	contribution of the Koup 1 WEF to cumulative impact at 50ha is considered relatively low and would not generate significant broad-scale impact. The contribution of the grid connection to cumulative impact would be low and considered acceptable.	
Geotechnical Assessment	The foregoing report presents the findings concluded from a desktop study undertaken for the proposed Koup 1 Wind Energy Facility and associated grid infrastructure. The site is anticipated to be underlain by shallow bedrock conditions. It is recommended that the turbines be constructed on relatively flat to gentle, open areas (0-8.7˚ slopes) in areas with maximum wind exposure. No fatal flaws, from a geotechnical perspective, were identified during this desktop study. Conclusions presented in this report will have to be more accurately confirmed during the detailed geotechnical investigation phase. The impact of the WEF was found to be “Negative low impact - The anticipated impact will have negligible negative effects and will require little to no mitigation.” Given the amendments to the original layout, the site from a desktop level geotechnical study is considered suitable for the proposed WEF.	It recommended that a detailed geotechnical investigation be undertaken during the detailed design phase of the project. The detailed geotechnical investigation must entail the following: • Profiling and sampling exploratory trial pits to determine founding conditions for the substation, the construction laydown area and the BESS. An investigation for determining the subgrade conditions for internal roads and a materials investigation (if required) is also recommended; • Profiling rotary core to determine foundation conditions for the turbines. • Geotechnical investigation for construction material – gravel and rock. • Thermal resistivity and electrical resistivity geophysical testing for electrical design and ground earthing requirements; • Groundwater sampling of existing boreholes to establish a baseline of the groundwater quality for construction purposes; • Dynamic Probe Super Heavy (DPSH) tests and rotary core drilling may be required depending on the soil profiles and imposed loads of the structures.

Specialist Study	Findings	Recommendations
Archeological Impact Assessment	Heritage resources are unique and non-renewable and as such any impact on such resources must be seen as significant. The fieldwork conducted for the evaluation of the possible impact of the new Koup 1 WEF and associated grid connection infrastructure has revealed the presence of 18 heritage resources. One archaeological site (**KO_18**) was rated as having low heritage significance. Four graves, burial grounds and possible graves (**KO-06 – KO-09**) were rated as having high heritage significance. Two structures (**KO-03**, **KO-05**) were rated as having medium heritage significance, 1 structure (**KO-02**) was rated as having low heritage significance and 2 structures (**KO-01; KO-04**) were rated as having no heritage significance. Eight find spots (**KO_10 – KO_17**) comprise several low-density Stone Age surface artefact scatters and were rated as having low heritage significance. These are primarily from the MSA, although both LSA and earlier ESA material was identified. All of the artefact assemblages (**including KO-18**) occur in heavily deflated and eroded areas, so their scientific potential and heritage significance is somewhat lowered. Based on findings from a range of other heritage reports in the area, these types of sites are to be expected in this region.	The calculated impact confirms the impact of the new Koup 1 WEF and associated grid connection infrastructure will be reduced from negative medium to negative low with the implementation of the mitigation measures. This finding in addition to the implementation of a chance finds procedure, as part of the EMPr, will mitigate possible impacts on unidentified heritage resources. The finalised layout has considered the sensitivities identified during the field assessment. By selecting the Grid Option 2, the possible pre-construction impacts calculated on the tangible cultural heritage resources is overall reduced to a **LOW NEGATIVE** impact after the recommendations have been implemented. This finding in addition to the implementation of a chance finds procedure, as part of the EMPr, will mitigate possible impacts on unidentified heritage resources. **The following mitigation measures will be required:** ▪ 50m buffer zones around grave sites ▪ 30m buffer zone around farmsteads ▪ 30m buffer zone around historical structures ▪ Monitor find spot areas if construction is going to take place through them. ▪ A management plan, after a walkdown of the final layout, for the heritage resources then needs to be

Specialist Study	Findings	Recommendations
		compiled and approved for implementation during construction and operations. In the event that heritage resources are discovered during site clearance, construction activities must stop in the vicinity, and a qualified archaeologist must be appointed to evaluate and make recommendations on mitigation measures. The overall impact of the Koup 1 WEF, on the heritage resources, is seen as acceptably **low** after the recommendations have been implemented and therefore, impacts can be mitigated to acceptable levels allowing for the development to be authorised.
Paleontological Impact Assessment	The combined Koup 1 WEF and grid connection project area is underlain by continental (fluvial / lacustrine) sediments of the Abrahamskraal and Teekloof Formations (Lower Beaufort Group, Karoo Supergroup) which are of Middle to Late Permian age. These bedrocks contain sparse, unpredictable to locally concentrated vertebrate fossils as well as rare trace fossils (*e.g.* tetrapod burrows) and plant material of scientific and conservation value. A substantial number of new fossil vertebrate sites (cranial and post-cranial material of large-bodied dinocephalians, small dicynodonts, rare tetrapod burrow casts) have been recorded during within the WEF project area during the short site visit, while several more sites have previously been mapped shortly outside its margins. These palaeontological sites, together with their sedimentological context, provide important data for on-going research into the pattern and causes of the Middle Permian Mass Extinction Event on land around 260 million years ago.	Recommended mitigation comprises (1) a specialist palaeontological walk-down of the final WEF and grid connection project areas in the pre-construction phase and (2) implementation of a Chance Fossil Finds Protocol (See Appendix 4) by the ECO / ESO during the construction phase. The palaeontologist responsible for the mitigation work will be required to submit a Work Plan for approval by Heritage Western Cape (HWC) The proposed WEF and grid connection developments are not fatally flawed and, on condition that the recommended mitigation measures are included within the relevant EMPrs and implemented

Specialist Study	Findings	Recommendations
	Scientifically-valuable and legally-protected fossil heritage resources preserved at or beneath the ground surface within the project footprint are potentially threated by clearance and bedrock excavations during the construction phase of the WEF and grid connection (*e.g.* for access roads, wind turbine foundations). The majority of the recorded fossil sites lie outside the project footprint but most of the WEF and grid connection footprint has yet to be palaeontologically surveyed on foot. A significant number of unrecorded sites almost undoubtedly lies within of very close to the project footprint. No Very High Sensitivity or No-Go palaeontological sites or areas have been identified within the Koup 1 WEF or grid connection project areas. Since all known fossil sites can be readily mitigated through professional recording and collection of fossil material in the pre-construction phase, no recommendations for micro-siting of infrastructure such as wind turbine, pylon positions or access roads are therefore made here. There are no preferences on palaeontological heritage grounds for specific site options for the Koup 1 WEF on-site substation and construction laydown area. Grid Option 1 (either alternative) was originally preferred for the grid connection since, being much shorter that Options 2 and 3, it is least likely to impact potential fossil sites. However, there are no objections to authorization of the chosen Option 2 grid corridor. The proposed Koup 1 WEF and associated grid connection developments are assigned a similar overall impact significance rating (Construction Phase) of NEGATIVE MEDIUM without mitigation and NEGATIVE LOW following mitigation. No significant further impacts on fossil heritage resources are anticipated in the planning, operational and decommissioning phases. The No-Go Option might have a NEGATIVE LOW or perhaps neutral impact significance; fossils will continue to be exposed and destroyed by natural weathering processes while the positive benefits of professional mitigation (*viz*. improved palaeontological database) will be lost. Anticipated cumulative	in full, there are no objections on palaeontological heritage grounds to their authorization. In terms of palaeontological heritage resources, the proposed Koup 1 WEF and associated grid connection developments are assigned a similar overall impact significance rating (Construction Phase) of NEGATIVE MEDIUM without mitigation and NEGATIVE MEDIUM following mitigation. No significant further impacts on fossil heritage resources are anticipated in the planning, operational and decommissioning phases. The No-Go Option might have a NEGATIVE LOW impact significance. Anticipated cumulative impacts in the context of several planned or authorized renewable energy projects in the region are assessed as NEGATIVE MEDIUM without mitigation and NEGATIVE LOW after mitigation. The proposed WEF and grid connection developments are not fatally flawed and, on condition that the recommended mitigation measures are included within the EMPr and implemented in full, there are no objections on palaeontological heritage grounds to their authorization.

Specialist Study	Findings	Recommendations
	impacts in the context of several planned or authorized renewable energy projects in the region are assessed as NEGATIVE MEDIUM before mitigation and NEGATIVE LOW after mitigation.	
Cultural Landscape Assessment	The Koup region is a significant cultural landscape that reflects the relationship between man and nature over a period of time. This relationship has generally been sustainable, where biodiversity and ecological systems have been maintained in the utilisation of the landscape expressed in specific land use patterns. The surrounding land use indicates a social appreciation of the natural environment with low impact stock farming with limited farmstead crop cultivation. The vastness and relative homogenous nature of the cultural landscape is, however, often undervalued. If careful contextual planning is not followed, it will rapidly result in a cluttered wasteland. This does not mean that development is discouraged, but rather that the implementation of wind and solar energy farms should be planned holistically. It is the duty of the planning department to consider this application in terms of other renewable energy developments that are planned/proposed for the Koup area, notably the proposed RE developments included in the cumulative impact section of this report. Conservation: to protect the natural resources (water, air, land, sand, fishes, etc.), ecosystems (reefs, fynbos), biological abundance (flora and fauna), landscapes and the local culture. Development: to protect social and economic progress, without damaging or depleting the natural resources (sustainable development). The findings of this report, coupled with the proposed layout for development of wind turbines, which considers appropriate placement in terms of wind energy capacity, concludes that the development can be permitted within the site if the report's recommendations are followed. The mitigating recommendations in this	From this study it is recommended that only 1 of turbines is not feasible in their current proposed locations for the proposed Koup 1 WEF when taking into consideration impacts to cultural landscapes. The substation and laydown area locations require some layout alteration to accommodate the farm road buffer. The access roads need to avoid slopes over 10% and visually sensitive slopes impacting on the historic farm roads. The collector substation for proposed Gridline Option 2 requires relocation out of the N12 scenic road buffer and the CBA. With these buffers in place and all other recommendations followed, the overall impact to the cultural landscape for the proposed Koup 1 WEF and associated grid connection and infrastructure can be reduced from very high to moderate. There are no fatal flaws and the development can proceed with CLA recommendations and mitigation in place.

Specialist Study	Findings	Recommendations
	report consider the ecological, aesthetic, historic and socio-economic value lines that underpin the layers of significance that combine to create the character of the place and the cultural landscape of the Koup. These recommendations include road and farmstead complex buffers which incorporate cultivated areas and graves, steep slope and ridgeline no-go areas as well as consideration of the unique land form of the site, CBA and ESA no-go areas, as well as mechanisms to support the non-landowner residents that live on the site in being able to continue their indigenous land use patterns, knowledge and social systems. These mitigations will reduce the impact on the surrounding landscape and heritage resources but due to the high visual impact of the turbines, largely a result of their height, the negative impact to the cultural landscape cannot be removed, only reduced from very high to moderate.	
Social Impact Assessment	While the project will create employment for local communities during the construction and operational phases, the more significant positive impact of the project will be the contribution it will make towards renewable energy infrastructure. Research recently published by Meridian Economics, in collaboration with the CSIR, indicates that "[i]*n all realistic mitigation scenarios, the majority of new build capacity is wind and solar PV*" (Roff, et al., 2020, p. 52), and highlights an urgent need for the country to accelerate the RE build pathway. In addition, the South African Climate Change Coordinating Commission, is considering a more ambitious emissions target and is suggesting changes to the country's energy plan (Paton, 2021). Considering the impacts discussed above, it is evident that the cumulative impacts associated with changes to the social environment of the region are more significant than those attached to any one project. On a negative front, there are two issues associated with developments in the region that are of most concern. 1. The first of these issues is the change to the sense of place of an area that was once considered a pristine region of South Africa.	The sensitive areas associated with the layout have been identified by various specialists and adjustments have been made to the Koup 1 layout by withdrawing all turbines associated with sensitive areas. Subsequently, the Grid Option 2 has been chosen as the proposed layout to be forwarded for approval. The Grid Option 1 was not feasible as Eskom won't permit two collectors within a small radius and Grid Option 3 is ruled out as a result of bird nests. Considering these adjustments, and that the positive social impacts associated with the project outweigh the negative, with a significant social benefit at a national level, the project is supported on a social basis.

Specialist Study	Findings	Recommendations
	2. The second is the potential, through an influx of labour and an increase in transportation to construction sites, of the risk for the prevalence of HIV increasing in an area that, at 8.7% in 2017, had the second lowest HIV prevalence rate in the country. The initiative to address these cumulative impacts lies at a far higher level than at an individual project level. In this regard, the Western Cape Government has undertaken an exercise to address intergovernmental readiness for the large development scenarios in the Central Karoo; which is a positive step towards addressing the cumulative impact of these developments (Western Cape Government Environmental Affairs and Development Planning, 2019).	
Surface Water Assessment	The nature of the wind farm is such that it carries a low intensity impact on aquatic resources. A wind farm typically targets the higher lying areas where wind resources are best, thus keeping the turbines away from freshwater resources for the most part, however, the associated roads, cables and other infrastructures must cross the site, and these come in more frequent contact with the drainage lines and associated features. The project also has a small footprint spread out over a large area, allowing for retention of much of the natural environment so that the systems should remain largely unaffected. A variety of aquatic features, mostly ephemeral in nature were observed within the study area and these were mapped and buffered as necessary for their protection. The current layout has, to a large degree, avoided these sensitive features and buffer areas, greatly reducing the potential overall impact and risk to Aquatic resources. The overall and cumulative impacts, as assessed, are linked to instances where complete avoidance was not possible, or the nature of the activities involve a potential risk to aquatic resources even at great distance. Overall, it is expected that the impact on the aquatic environment would be Low (-).	Based on the findings of this study, the specialist finds no reason to withhold to an authorisation of any of the proposed activities, assuming that key mitigations measures are implemented. Lastly no preference is provided with regard the grid connections, as it assumed based on the characteristics of the site, that all the aquatic systems could be spanned, while making use of existing tracks, however technical considerations have resulted in Option 2 being selected. Therefore, based on the refinement of the Substation / Laydown positioning not direct impacts on the aquatic environment are anticipated

Specialist Study	Findings	Recommendations
	Noteworthy areas, that should be avoided, include the Very High Sensitivity areas as show in this report. Existing crossings may be used and/or upgraded that intersect these systems however, but these crossings, detailed monitoring plan must be developed in the pre-construction phase.	
Transportation Impact Assessment	Based on the information received and the foregoing results concluded, our summary of conclusions are as follows: o The Koup WEF development consists of two separate EIA applications namely; - Koup 1 & Koup 2. Although this report only focuses on the Koup 1 WEF, both developments are taken into account for this study as they share a common access point from the N12 Freeway. o The construction phase of this development will typically generate the highest number of additional vehicles. It will however be temporary and impacts are considered to be minimal / low. o During the operation phase, it is expected that the facility will accommodate ±35 employees which will generate an additional ±10 trips / day in the morning and afternoon peak period. This impact is considered to be minimal / low. o The Existing access from the N12 Freeway has sufficient sight distance in both directions and hence an upgrade of the existing access will be required from the Western Cape Department of Transport & Public Works. o The gravel road between the N12 Freeway and the development will require upgrades. We also recommend a review of the agreement between the developer and the owner of REM of Portion 4 of the farm 374.	Mitigation measures to be included in the construction phase: • Ensure staff transport is done in the 'off peak' periods and by bus. • Stagger material, component and abnormal loads • Construction of an on-site concrete batching plant to reduce trips. • Adequate road signage according to the SARTSM • Reduction in speed of vehicles • Adequate enforcement of the law • Implementation of pedestrian safety initiatives • Implement a road maintenance program under the auspices of the respective transport department. • Regular maintenance of farm fences & access cattle grids • Use of dust suppressant techniques With reference to this report, associated assessment and the findings made within, it is SiVEST's opinion that the Koup 1 Wind Energy Facility and associated infrastructure will have a nominal impact on the

Specialist Study	Findings	Recommendations
	o The 'No Go' alternative would result in there being no transportation impacts. o No fatal flaws or preferences were identified for any of the proposed site alternatives for construction laydown areas or substation locations. o No environmentally sensitive areas are required and therefore no areas are to be avoided from a Transportation perspective.	existing traffic network. The project is therefore deemed acceptable from a transport perspective, provided the recommendations and mitigations measures in this report are implemented, and hence the Environmental Authorisation (EA) should be granted for the EIA application.
Visual Impact Assessment	A scoping level visual study was conducted to assess the magnitude and significance of the potential visual impacts associated with the development of the proposed Koup 1 WEF and associated grid connection infrastructure near Beaufort West in the Western Cape Province. Overall, sparse human habitation and the predominance of natural vegetation cover across much of the study area would give the viewer the general impression of a largely natural setting with some pastoral elements. As such, a WEF development with associated grid connection infrastructure would alter the visual character and contrast significantly with the typical land use and/or pattern and form of human elements present across the broader study area. The level of contrast will however be reduced by the presence of the N12 national route and existing high voltage power lines traversing the study area. A broad-scale assessment of visual 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.	It is SiVEST's opinion that the potential visual impacts associated with the proposed Koup 1 WEF and associated grid infrastructure development are negative and of moderate significance. Given the low level of human habitation and the absence of sensitive receptors however, the project is deemed acceptable from a visual perspective and the EA should be granted. SiVEST is of the opinion that the impacts associated with the construction, operation and decommissioning phases can be mitigated to acceptable levels provided the recommended mitigation measures are implemented.

Specialist Study	Findings	Recommendations
	The area is not typically valued for its tourism significance and there is limited human habitation resulting in relatively few sensitive or potentially sensitive receptors in the area. A total of forty-six (46) potentially sensitive receptors were identified in the combined study area, three (3) of which are considered to be sensitive receptors as they are linked to leisure/nature-based tourism activities in the area. None of the sensitive receptors are however expected to experience high levels of visual impact from either the proposed WEF facility or the grid connection infrastructure. The remaining forty three (43) identified receptors are all assumed to be farmsteads which are regarded as potentially sensitive visual receptors as they are located within a mostly rural setting and the proposed development will likely alter natural vistas experienced from these locations. Only seven (7) of these receptors are expected to experience high levels of visual impact as a result of the WEF development. This sensitivity rating relates largely to the fact that these receptors are located in in close proximity to the boundary of the Koup 1 WEF application site and they are in zones of high contrast, with little natural screening present. Two of these receptors, namely VR12 and VR31 are in fact located within the proposed Koup 1 WEF development area and as such, these properties form part of the WEF project. Thus it is assumed that the owners have a vested interest in the WEF development and would not perceive the development in a negative light. Furthermore, none of these receptors are tourism-related facilities and as such they are not considered to be Sensitive Receptors. Thirty-two (32) potentially sensitive receptor locations would be subjected to moderate levels of visual impact as a result of the proposed Koup 1 WEF development, while the remaining two (2) receptor locations will be subjected to low levels of visual impact.	

Specialist Study	Findings	Recommendations
	Two (2) potentially sensitive receptor locations are expected to experience high levels of visual impact as a result of the proposed power line. The high sensitivity rating relates largely to the fact that these receptors are very close to the proposed power assessment corridors. Both of these receptors are in fact also located close to existing 400kV power lines this factor is expected to reduce the level of visual impact resulting from new power lines. Nine (9) potentially sensitive receptor locations would be subjected to moderate levels of visual impact as a result of the proposed power line, while the remaining two (2) would be subjected to low levels of visual impact. Although the N12 receptor road traverses the study area, motorists travelling along this route are only expected to experience moderate impacts from the proposed Koup 1 WEF and from the grid connection infrastructure associated with the project. An overall impact rating was also conducted as part of the scoping phase in order to allow the visual impact to be assessed alongside other environmental parameters. The assessment revealed that impacts associated with the proposed Koup 1 WEF and associated grid connection infrastructure will be of low significance during both construction and decommissioning phases. During operation, visual impacts from the WEF would be of medium significance with relatively few mitigation measures available to reduce the visual impact. Visual impacts associated with the grid connection infrastructure during operation would be of low significance. Although other proposed renewable energy developments and infrastructure projects were identified within a 35km radius of the Koup 1 WEF project, it was determined that six (6) of these would have any significant impact on the landscape within the visual assessment zone, namely Beaufort West WEF, Trakas WEF, Kwagga 1, 2 and 3 WEFs and Koup 2 WEF. These proposed	

Specialist Study	Findings	Recommendations
	WEFs, in conjunction with the associated grid connection infrastructure, will inevitably introduce an increasingly industrial character into a largely natural, pastoral landscape, thus giving rise to significant cumulative impacts. 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. In light of this and the relatively low level of human habitation in the study area however, cumulative impacts have been rated as medium. A comparative assessment of site alternatives for the on-site WEF infrastructure and also for the grid connection alternatives was undertaken in order to determine which of the alternatives would be preferred from a visual perspective. No fatal flaws were identified in respect of any of the alternatives for the proposed on-site substation / BESS facilities or for the construction laydown and O&M areas and all alternatives were found to be favourable. No fatal flaws were identified for any of the grid connection infrastructure alternatives. Power Line Corridor Option 1 was identified as the Preferred Alternative, while Power Line Corridor Options 2 and 3 were found to be favourable.	

18. ENVIRONMENTAL IMPACT STATEMENT

The specialist assessments were conducted to address the potential impacts relating to the proposed development in order to ascertain the level of each identified impact, as well as mitigation measures which may be required. The results of the specialist assessments have indicated that all alternatives (including the preferred alternative) contain no fatal flaws that should prevent the proposed project from proceeding. In light of this, it is the EAP's reasoned opinion that authorisation be granted and that the layout being proposed as part of this BA process also be authorised (provided there are no concerns raised during the public participation process).

A layout of the development and the environmental sensitivities is included below:

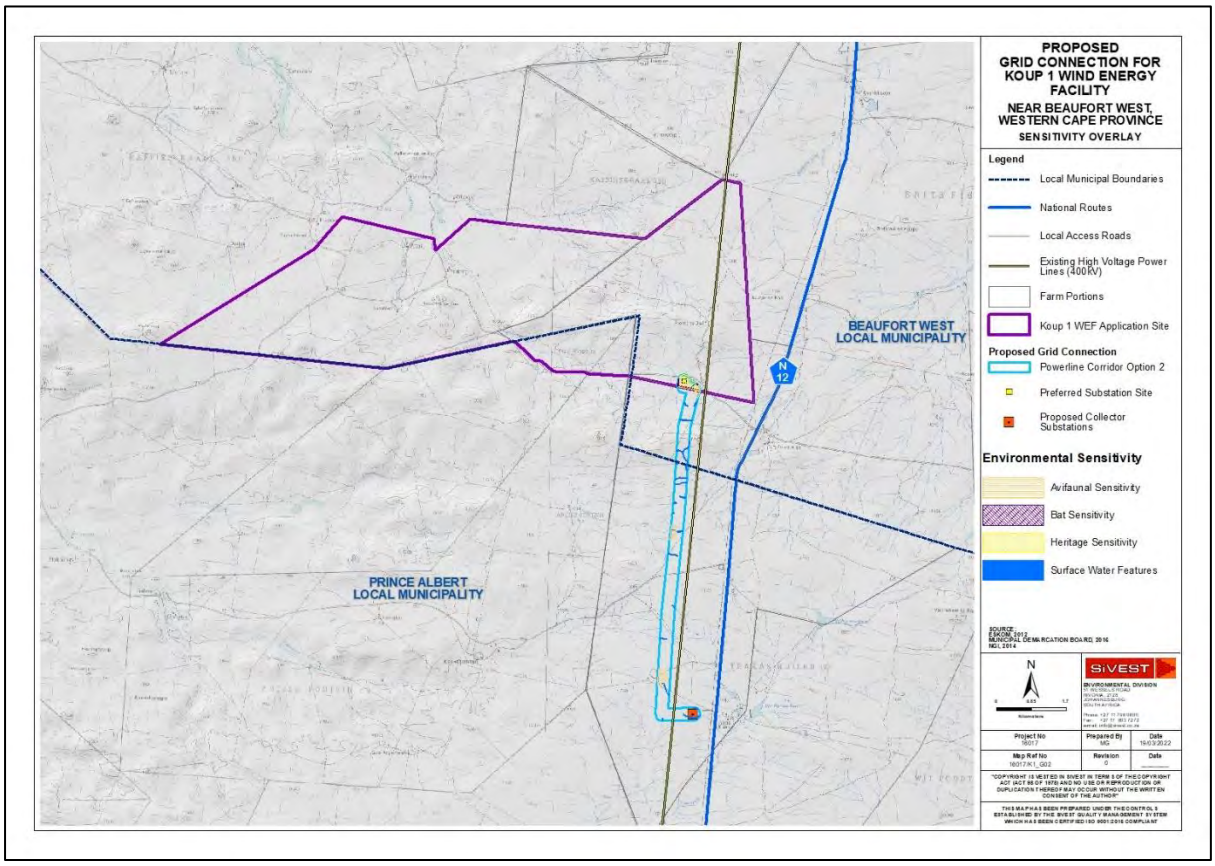

Figure 40: Layout of preferred alternatives with sensitives overlaid

The following specialist studies have been undertaken for the project:

- Visual Impact Assessment
- Transportation Impact Assessment
- Heritage Impact Assessment
- Palaeontological Impact Assessment
- Archaeological Assessment
- Cultural Landscape Assessment
- Desktop Geotechnical Assessment

- Agriculture and Soils Impact Assessment (desktop)
- Social Impact Assessment (desktop)
- Surface Water Impact Assessment
- Biodiversity Impact Assessment
- Avifaunal Impact Assessment

All specialist studies are included in **Appendix 6**. The specialist assessments concluded the following:

The **visual** specialist confirmed that that the potential visual impacts associated with the proposed Koup 1 WEF and associated grid infrastructure development are negative and of moderate significance. Given the low level of human habitation and the absence of sensitive receptors however, the project is **deemed acceptable from a visual perspective** and the EA should be granted. SiVEST is of the opinion that the impacts associated with the construction, operation and decommissioning phases can be mitigated to acceptable levels provided the recommended mitigation measures are implemented.

The **transportation** specialist confirmed that Koup 1 Wind Energy Facility and associated infrastructure will have a nominal impact on the existing traffic network. The project is therefore **deemed acceptable from a transport perspective**, provided the recommendations and mitigations measures in the traffic report are implemented, and hence the Environmental Authorisation (EA) should be granted for the EIA application.

In terms of **palaeontological** heritage resources, the specialist confirmed that the proposed Koup 1 grid connection developments are assigned a negative medium impact following mitigation. No significant further impacts on fossil heritage resources are anticipated in the planning, operational and decommissioning phases. The No-Go Option might have a negative low impact significance. The proposed grid connection development is not fatally flawed and, on condition that the recommended mitigation measures are included within the EMPr and implemented in full, there are no objections on palaeontological heritage grounds to their authorization.

The **archeologist** confirmed that the overall impact of the Koup 1 WEF and Grid, on the heritage resources, is seen as acceptably low after the recommendations have been implemented and therefore, impacts can be mitigated to acceptable levels allowing for the development to be authorized.

The **cultural specialist** recommended that the collector substation for proposed Gridline Option 2 requires relocation out of the N12 scenic road buffer and the CBA. With these buffers in place and all other recommendations followed, the overall impact to the cultural landscape for the proposed Koup 1 WEF and associated grid connection and infrastructure can be reduced from very high to moderate. There are no fatal flaws and the development can proceed with CLA recommendations and mitigation in place.

The **geotechnical specialist** confirmed that **no fatal flaws**, from a geotechnical perspective, were identified during this desktop study. The impact was found to be a negative low impact. The anticipated impact will have negligible negative effects and will require little to no mitigation. The site from a desktop level geotechnical study is considered suitable for the proposed development.

The **agricultural specialist** concluded that the proposed development will not have an unacceptable negative impact on the agricultural production capability of the site and the proposed development was identified as acceptable. From an agricultural impact point of view, it is recommended that the development be approved.

The **social specialist** that the positive social impacts associated with the project outweigh the negative, with a significant social benefit at a national level, the project is supported on a social basis.

The **surface water** specialist confirmed that, based on the findings of this study, there is no reason to withhold an authorisation of any of the proposed activities, assuming that key mitigations measures are implemented. No preference is provided with regard the grid connections, as it assumed based on the characteristics of the site, that all the aquatic systems could be spanned, while making use of existing tracks, however technical considerations have resulted in Option 2 being selected. Therefore, based on the refinement of the Substation / Laydown positioning not direct impacts on the aquatic environment are anticipated.

The **biodiversity specialist** confirmed that there are no impacts associated with the Koup 1 Grid Connection Option 2 and associated infrastructure that cannot be mitigated to an acceptable level. With the application of relatively simple mitigation and avoidance measures, the impact of the Koup 1 Grid Connection on the local environment can be reduced to a low and acceptable magnitude. The contribution of the Koup 1 Grid Connection development to cumulative impact in the area would be low and is considered acceptable. Overall, there are no specific long-term impacts likely to be associated with the development of the Koup 1 grid connection hat cannot be reduced to a low significance. As such, there are no fatal flaws associated with the development and no terrestrial ecological considerations that should prevent it from proceeding.

The **avifaunal specialist** confirmed that the proposed Koup 1 WEF grid connection will have a moderate impact on avifauna which, in most instances, could be reduced to a low impact through appropriate mitigation. **None of the proposed corridor options are fatally flawed**. The development is therefore supported, provided the mitigation measures listed in this report are strictly implemented.

The main findings of the specialist studies are included in **Section 17** above.

A summary of the positive and negative impacts associated with the proposed project is included in **Section 16** above.

It is trusted that the DBAR provides adequate information to the I&APs / stakeholders to provide input and for the competent authority to make an informed decision regarding the proposed development.

It should be noted that this section is deemed to be in line with the requirements of Appendix 1 of the EIA Regulations 2014, as amended, and contains a summary of the key findings of the environmental impact assessment, 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 (**Figure *38*Figure 38 and 39**) and a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.

19. ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR) AND CONDITIONS TO BE INCLUDED IN THE EA

In accordance with Appendix 4 of the EIA Regulations, 2014 (as amended), a draft EMPr has been included within the DBAR. The draft EMPr includes the impact management measures formulated by

the various specialists and the recording of the proposed impact management outcomes for the development have also been included in the draft EMPr (**Appendix 8**).

The draft EMPr provides suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored. The relevant management plans have also been incorporated into the draft EMPr (where required), which will assist in this regard.

The draft EMPr will need to be finalized once specialist walk downs have been undertaken prior to construction.

Taking into account the potential negative and significant positive impacts that the proposed development could have on the biophysical and social environment, it is the opinion of the EAP that the proposed development should be authorised subject to the following conditions of authorisation:

- All of the mitigation measures identified in this BA Report must be made conditions of the authorisation.
- It is important that all of the listed mitigation measures are costed for in the construction phase financial planning and budget so that the contractor and/or developer cannot give financial budget constraints as reasons for non-compliance.
- All feasible and practical mitigation measures recommended by the various specialists must be incorporated into the Final Environmental Management Programme (EMPr) and implemented, where applicable;
- Where applicable, monitoring should be undertaken to evaluate the success of the mitigation measures recommended by the various specialists; and
- The final layout should be submitted to the Competent Authority (namely the DFFE) for approval prior to commencing with the activity.
- The activity-specific construction EMPr must be adhered to.
- An independent Environmental Control Officer (ECO) must be appointed by the applicant to monitor the implementation of the construction EMP. The ECO should undertake regular site inspections and compile an environmental audit report.

20. 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

None.

21. UNCERTAINTIES, ASSUMPTIONS AND GAPS IN KNOWLEDGE

The assessment has been based by SiVEST on information sourced and provided by the Applicant, site visits conducted, specialist findings and the application of the SiVEST assessment criteria. The EAP is of the opinion that the assessment method applied is acceptable. SiVEST assumes that:

- All the information provided by the Applicant is accurate and unbiased.

- The available data, including Topocadastral maps, Orthophotographs, geological maps and Google Earth images, are reasonably accurate.
- It is not always possible to involve all Interested and/or Affected Parties (I&APs) individually, however, every effort has/will be made to involve as many interested parties as possible. It is also assumed that individuals representing various associations or parties convey the necessary information to these associations / parties.
- It is not possible to determine the actual degree of the impact that the development will have on the immediate environment without some level of uncertainties. Actual impacts can only be determined following construction and/or operation commences.
- SiVEST undertook every effort to obtain the information (including specialist studies, BA / EIA / Scoping and EMPr Reports) for the surrounding developments. However, many of the documents are not currently publicly available to download. The information that could be obtained for the surrounding planned renewable energy developments was taken into account as part of the cumulative impact assessment.
- Refer to specialist studies (**Appendix 6**) for their specific assumptions and limitations.

22. AUTHORISATION OF THE PROPOSED KOUP 1 GRID PROJECT

The specialist assessments were conducted to address the potential impacts relating to the proposed development in order to ascertain the level of each identified impact, as well as mitigation measures which may be required. The results of the specialist assessments have indicated that all alternatives (including the preferred alternative) contain no fatal flaws that should prevent the proposed project from proceeding. In light of this, it is the EAP's reasoned opinion that authorization be granted and that the layout being proposed as part of this BA process also be authorized (provided there are no significant concerns raised during the public participation process).

Conditions to be included in the Environmental Authorisation for the construction phase are listed in **Section 18** above.

The environmental authorization should be valid for a period of 5 to 10 years. It is anticipated that the construction period will however commence shortly after authorization.

23. EAP DECLARATION

The EAP declarations, CV's and qualifications for the EAP's responsible for the preparation of this report have been attached in **Appendix 1**.

24. INFORMATION REQUIRED BY THE CA (IF APPLICABLE)

Currently n/a.

25. CONCLUSION

This Basic Assessment Report has covered activities and findings related to the BA process for the proposed Koup 1 Substation and Powerline. Professional experience, specialist knowledge, relevant

literature and local knowledge of the area have all been used to identify the potential issues associated with the proposed project.

There is no guarantee that all the potential impacts arising from the proposed project have been identified within the Basic Assessment phase, however the report provides an outline of the established measures that were taken to best identify all the potential impacts.

26. WAY FORWARD

The Draft Basic Assessment Report is currently being circulated for public participation for a period of 30 days (excluding public holidays) from **29 April 2022** until **30 May 2022.**

All comments received will be responded to in a C&RR, which will be included prior to submission of the Final Basic Assessment Report (FBAR) to the decision-making authority, namely the DFFE. Comments received on the report will be taken into consideration, incorporated into the report (where applicable) and will be used when compiling the FBAR.

Once the FBAR has been submitted and the DFFE have acknowledged receipt thereof, a decision to either grant or refuse the EA for the proposed development will be made by the DFFE. In addition, once a decision regarding the EA has been received from the DFFE, it will be made available to the public and all registered I&APs, stakeholders and OoS / authorities will be notified accordingly and provided details regarding the appeal process. The BA process will thus come to an end once appeals (if any) have been dealt with adequately and the appeal process closes.

All I&APs and key stakeholders are invited to register as I&APs in order to be kept informed throughout the process. To register as an I&AP / stakeholder and/or to obtain additional information, please submit your name, contact details (telephone number, postal address and email address) and the interest which you have in the application to SiVEST Environmental Division, as per the details below:

Contact: Hlengiwe Ntuli
PO Box 2921, RIVONIA, 2128
☎ Phone: (011) 798 0600
E-mail: sivest_ppp@sivest.co.za
Fax: (011) 803 7272
Website: www.sivest.com

Please reference '*Koup 1 Grid'* in your correspondence, should your comments be project specific. SiVEST shall keep all registered I&APs / key stakeholders informed of the BA process.

SiVEST Environmental Division
4 Pencarrow Crescent,
La Lucia Ridge Office Estate,
Umhlanga Rocks, 4320
PO Box 1899, Umhlanga Rocks, 4320
KwaZulu-Natal, South Africa

Tel +27 31 581 1576
Email info@sivest.co.za
www.sivest.co.za

Contact Person: Michelle Guy
Email: michelleg@sivest.co.za