

**GREAT KAROO WIND FARM AND GRID CONNECTION, NORTHERN CAPE
PROVINCE**

ECOLOGICAL WALKDOWN REPORT

FOR

Savannah Environmental (Pty) Ltd

BY



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DATE

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REVISION 1

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SPECIALIST REPORT DETAILS

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I, **Dr. Brian Michael Colloty** declare that this report has been prepared independently of any influence or prejudice as may be specified by the National Department of Environmental Affairs and or Department of Water and Sanitation.



Signed:..... Date:....5 July 2021.....

Appendix 1 of this report contains a detailed CV

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1. Introduction

Great Karoo Wind Farm (Pty) Ltd (Great Karoo) holds an Environmental Authorisation (DEA Reference: 12/12/20/2370/3), dated 12 August 2014, to construct a 140 MW Wind Energy Facility on the Farm Kentucky 206 and Portion 1 of Farm Wolvenkop 207, within the Karoo Hoogland Local Municipality, near Sutherland, Northern Cape Province.

The EA was subsequently amended on 25 July 2015 (AM1), 5 May 2017 (AM2) and 19 September 2019 (AM3). The most recent amendment in 2019 was to revise the number of turbines, the technical description, turbine specification, site layout, extend the validity of the EA and other specific conditions (Conditions 6, 13.2 and 49) of the EA. The Great Karoo grid connection received Environmental Authorisation on 10 June 2021 (Ref: 14/12/16/3/3/1/2253) and a Battery Energy Storage System (BESS) within the footprint of the wind farm was authorised on 13 May 2021 (Ref: 14/12/16/3/3/1/2237).

As part of the Wind Farm Environmental Authorization and permitting conditions for the development, a pre-construction walk-through of the facility and grid connection is required before construction can commence. This also assisted with any micro-siting of any of the currently proposed wind farm and associated infrastructure, including wind turbines, turbine hardstands, internal access roads, underground MV cables alongside roads, overhead MV cables, temporary laydown areas, batch plants and construction camps as well as permanent Office and Maintenance Buildings, Substation, Switchyard, 132kV overhead powerline (Figure 1) and Battery Energy Storage System (BESS). This walkdown also considered the ~12.5 km x 300m wide grid connection corridor that extends from the Great Karoo Wind Farm Substation to the Hidden Valley Substation on the Karusa Wind Farm site (also Figure 1).

This report is based on a 6-day walk-down, conducted in June 2021. The aim of this, was to locate and identify any sensitive ecological features, protected or threatened plant species and/or fauna of conservation concern within the development footprint. The identity and location of all listed and protected species is also provided, which can be used as input for the vegetation clearing permit application that is required from the provincial authority, i.e. the Department of Agriculture, Environmental Affairs, Rural Development and Land Reform before construction can commence.

Further recommendations for avoidance or search and rescue for specific habitats were also provided to the development / engineering team (Table 1). These were provided as additional High Sensitivity / No-Go Areas highlighted in this report, however these sensitive areas were considered in the refinement of the layout and none of the possible turbines, roads, substation, associated infrastructure or temporary works are located near these areas as shown in Figure 2.

Note the final layout will also be based on additional input provided by the Bat, Avifaunal and Heritage specialists and this report should be read in conjunction with those reports to contextualise the overall constraints provided to the development team. The input by the various specialists, this report, and various technical constraints saw the overall reduction of the project footprint, that resulted in only 42 turbines now being considered versus the original 57 turbines that are authorised in the Environmental Authorisation (as amended).

1.1 Aims and objectives

- Conduct a pre-commencement ecological (terrestrial fauna & flora and aquatic) walk-through survey / assessment of the footprint areas:
 - Provide a professional opinion on ecological issues relating to terrestrial fauna & flora and the aquatic environment within the footprint areas of the optimised layout;
 - Report on the presence of potential wetlands that could be affected and where the relevant mitigation measures need to be implemented if needed;
 - Serve as background information for any ecological permits required for the disturbance to, destruction of, or removal of species of conservation concern and/or protected plants or trees;

- Serve as additional ecological information for the Proponent, contractors and Environmental Control Officers (ECOs) and/or Environmental Officers (EOs) involved in the development.
- This is also to facilitate micro-siting of footprint areas, where possible and by taking cognisance of other constraints, with the aim to further reduce negative impacts of the development.
- Aid in future decisions and environmental management regarding the project.

1.2 Assumptions and Limitation

To obtain a comprehensive understanding of the dynamics of both the flora and fauna of the terrestrial and aquatic communities within a study site, as well as the status of endemic, rare or threatened species in any area, assessments should always consider investigations at different time scales (across seasons/years) and through replication. No long-term monitoring was undertaken as part of this assessment. However, a concerted effort was made to assess the entire site, as well as make use of any available literature, species distribution data and aerial photography. The report author has also been implementing the plant & animal search and rescue operations on the adjoining farms from mid-2019, which includes the two adjoining wind farms under construction (Karusa & Soetwater) and the associated grid connections that extend to the Komsberg Eskom substation, which all encompass a 17 000ha area, assessed on a bimonthly basis to determine re-vegetation recovery and plant relocation success on these projects.

It should be emphasised that information, as presented in this document, only has reference to the study area as indicated on the accompanying maps. Therefore, this information cannot be applied to any other area without detailed investigation.

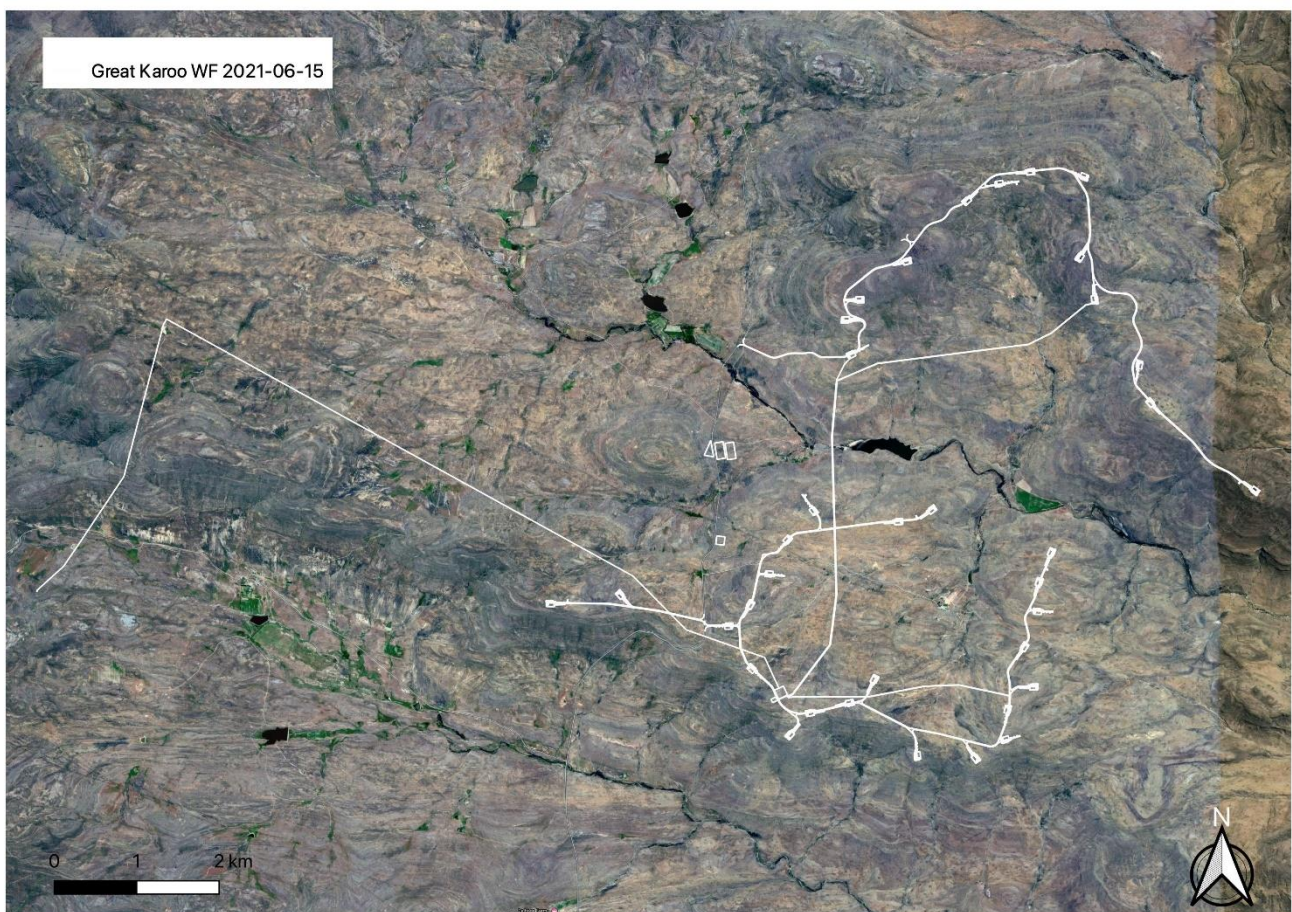


Figure 1: The proposed project layout used in the walk down assessment conducted in June 2021

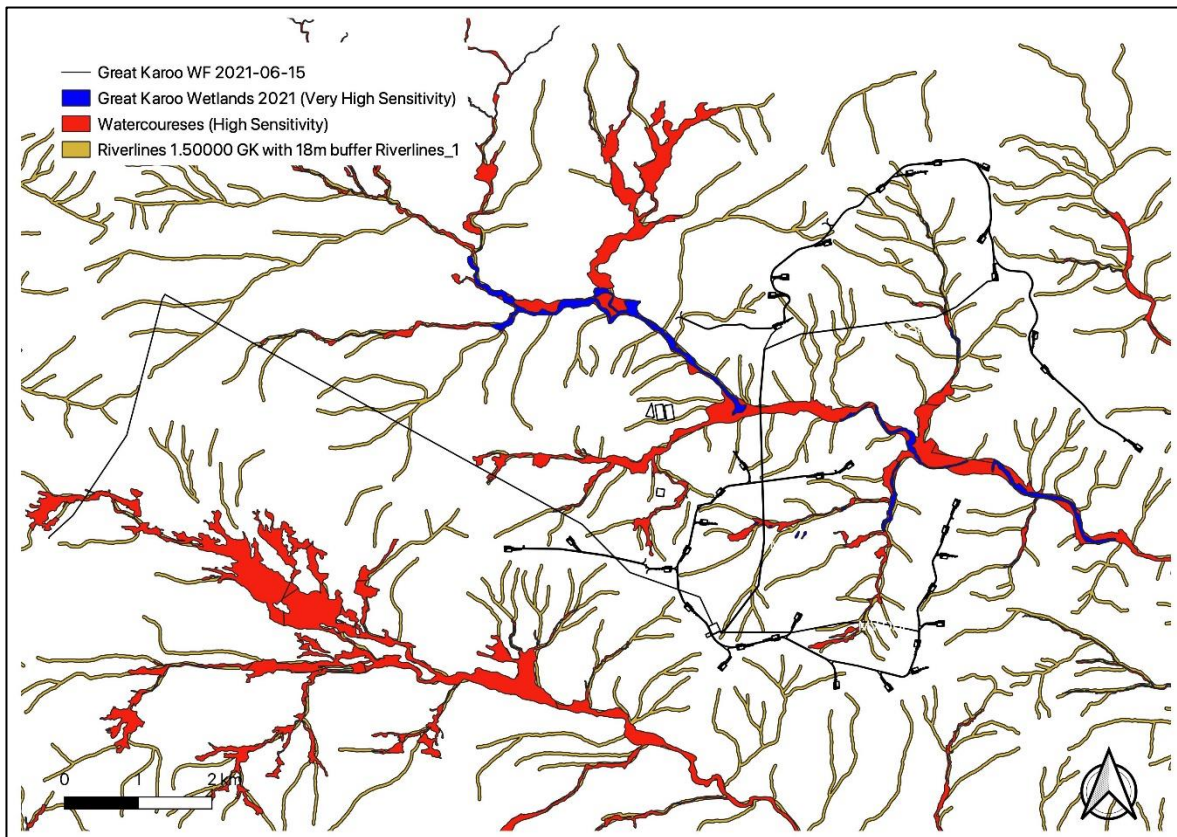


Figure 2: Optimised wind farm layout based on the findings of this assessment and past assessments with regard aquatic habitats in particular as the remaining habitats (terrestrial) within the proposed footprints would be considered LOW – MEDIUM Sensitivity environments.

2. Species identification and permitting requirements

In preparation for the walkdowns, the following sources of information were assessed to produce a species checklist:

- South African National Botanical Institute’s (SANBI’s) Integrated Biodiversity Information System database for the quarter degree squares 3220DC & 3220DD within which the project falls (POSA).
- Species of conservation concern were extracted from the list based on their status according to Red List of South African Plants version 2020.1. Downloaded from Redlist.sanbi.org on 2021/05/19.
- Species listed as endangered or protected under the Northern Cape Nature Conservation Act (No. 9 of 2009).
- Hoare, D. (2012). Impact Assessment Report: Specialist ecological study on the potential impacts of the Proposed Hidden Valley Wind Energy Facility Project near Matjiesfontein. Northern Cape. Savannah Environmental

3. Results - Flora

The continued drought within the region limited the number of plants visible in the region, with rains in excess of 60mm in the winter period, only falling in July 2021 after the surveys were conducted. However several plants were still observed and are listed in Table 1 below.

All protected plant species, (protected in terms of the Northern Cape Nature Conservation Act (No. 9 of 2009) legislation) are listed below. The disturbance, destruction and/or relocation, whichever is more relevant, of these species would require the relevant permits from the provincial authority, noting that the majority of the species listed below were found outside of the June 2021 project layout. This does not however preclude them from being found within the footprints especially after the recent rains.

Table 1: List of potential listed and protected plants, and if they had been observed during past and present surveys within the project footprint

Family	Genus	Species	Subspecies	IUCN Status	2021 Survey	NCNCA (No 9 of 2009) Observed
AIZOACEAE	<i>Aloinopsis</i>	<i>spathulata</i>		LC	X	X
AIZOACEAE	<i>Antimima</i>	<i>prolongata</i>		LC	X	X
AIZOACEAE	<i>Antimima</i>	<i>pumila</i>		DDT	X	X
AIZOACEAE	<i>Cheiridopsis</i>	<i>namaquensis</i>		LC	X	X
AIZOACEAE	<i>Hammeria</i>	<i>meleagris</i>		LC	X	X
AIZOACEAE	<i>Lampranthus</i>	<i>spp</i>		LC	X	X
AIZOACEAE	<i>Ruschia</i>	<i>caroli</i>		LC	X	X
AIZOACEAE	<i>Ruschia</i>	<i>pungens</i>		DDT	X	X
AIZOACEAE	<i>Stomatium</i>	<i>suaveolens</i>		LC	X	X
AIZOACEAE	<i>Cleretum</i>	<i>lyratifolium</i>		LC		
AIZOACEAE	<i>Cleretum</i>	<i>Papulosum</i>		LC	X	X
AMARYLLIDACEAE	<i>Boophone</i>	<i>disticha</i>		Declining	X	X
AMARYLLIDACEAE	<i>Brunsvigia</i>	<i>josephinae</i>		VU		
AMARYLLIDACEAE	<i>Strumaria</i>	<i>karooica</i>		Rare		X
AMARYLLIDACEAE	<i>Gethyllis</i>	<i>verticillata</i>		LC	X	X
AMARYLLIDACEAE	<i>Gethyllis</i>	<i>spiralis</i>		LC	X	X
ANACAMPSEROTACEAE	<i>Anacampseros</i>	<i>marlothii</i>		LC	X	X
APOCYNACEAE	<i>Hoodia</i>	<i>gordonii</i>		DDD		
APOCYNACEAE	<i>Hoodia</i>	<i>pilifera</i>	<i>pillansii</i>	DDT		
ASPARAGACEAE	<i>Asparagus</i>	<i>capensis</i>		LC	X	X
ASPHODELACEAE	<i>Aloe</i>	<i>microstigma</i>		LC	X	X
ASPHODELACEAE	<i>Bulbine</i>	<i>torta</i>		Rare		
ASTERACEAE	<i>Cotula</i>	<i>coronopifolia</i>		LC	X	X
ASTERACEAE	<i>Dimorphotheca</i>	<i>cuneata</i>		LC	X	X
ASTERACEAE	<i>Elytropappus</i>	<i>rhinocerotis</i>		LC	X	X
ASTERACEAE	<i>Eriocephalus</i>	<i>grandiflorus</i>		Rare		
ASTERACEAE	<i>Eriocephalus</i>	<i>ericoides</i>		LC	X	X
ASTERACEAE	<i>Euryops</i>	<i>marlothii</i>		Rare		
ASTERACEAE	<i>Euryops</i>	<i>petraeus</i>		Rare		
ASTERACEAE	<i>Euryops</i>	<i>lateriflorus</i>		LC	X	X
ASTERACEAE	<i>Felcia</i>	<i>filifolia</i>		LC	X	X
ASTERACEAE	<i>Gnaphalium</i>	<i>declinatum</i>		NT		

Family	Genus	Species	Subspecies	IUCN Status	2021 Survey	NCNCA (No 9 of 2009) Observed
ASTERACEAE	<i>Petronia</i>	<i>glomerata</i>		LC	X	X
ASTERACEAE	<i>Phymaspermum</i>	<i>schoeteri</i>		Rare		
ASTERACEAE	<i>Rosenia</i>	<i>oppositifolia</i>		LC	X	X
COLCHICACEAE	<i>Colchicum</i>	<i>coloratum</i>	<i>burchellii</i>	LC		
CRASSULACEAE	<i>Adromischus</i>	<i>humilis</i>		Rare		
CRASSULACEAE	<i>Adromischus</i>	<i>phillipsiae</i>		Rare		X
CRASSULACEAE	<i>Crassula</i>	<i>roggeveldii</i>		Rare		
CRASSULACEAE	<i>Crassula</i>	<i>rupestris</i>	<i>commutata</i>	Rare		
CRASSULACEAE	<i>Crassula</i>	<i>corallina</i>	<i>macrorrhiza</i>	LC	X	X
CRASSULACEAE	<i>Tylecodon</i>	<i>paniculatus</i>		LC	X	X
EBENACEAE	<i>Diospyros</i>	<i>austro-africana</i>		LC	X	X
ERICACEAE	<i>Erica</i>	<i>caffrorum</i>	<i>glomerata</i>	DDT		
EUPHORBIACEAE	<i>Euphorbia</i>	<i>mauritanica</i>		LC	X	X
EUPHORBIACEAE	<i>Euphorbia</i>	<i>multifolia</i>		LC	X	X
EUPHORBIACEAE	<i>Euphorbia</i>	<i>hamata</i>		LC	X	X
FABACEAE	<i>Lotononis</i>	<i>venosa</i>		VU		
HYACINTHACEAE	<i>Drimia</i>	<i>capensis</i>			X	X
HYACINTHACEAE	<i>Lachenalia</i>	<i>congesta</i>		Rare	X	X
IRIDACEAE	<i>Babiana</i>	<i>crispa</i>		LC	X	X
IRIDACEAE	<i>Ixia</i>	<i>brevituba</i>		Rare		
IRIDACEAE	<i>Ixia</i>	<i>trifolia</i>			X	X
IRIDACEAE	<i>Moraea</i>	<i>contorta</i>		Rare		X
IRIDACEAE	<i>Moraea</i>	<i>Miniata</i>		LC	X	X
IRIDACEAE	<i>Romulea</i>	<i>komsbergensis</i>		NT		
IRIDACEAE	<i>Romulea</i>	<i>subfistulosa</i>		NT		
IRIDACEAE	<i>Romulea</i>	<i>multifida</i>		VU		
IRIDACEAE	<i>Romulea</i>	<i>syringodeoflora</i>		VU		
IRIDACEAE	<i>Romulea</i>	<i>eburnea</i>		VU		
IRIDACEAE	<i>Geissorhiza</i>	<i>karooica</i>		NT		
MESEMBRYANTHEMACEAE	<i>Delosperma</i>	<i>sphalmanthoides</i>		DDT	X	X
MESEMBRYANTHEMACEAE	<i>Drosanthemum</i>	<i>spp</i>		LC	X	X
MESEMBRYANTHEMACEAE	<i>Ruschia</i>	<i>inclusa</i>		DDT		
OXALIDACEAE	<i>Oxalis</i>	<i>obtusa</i>		LC	X	X
POACEAE	<i>Helictotrichon</i>	<i>namaquense</i>		VU		
PROTEACEAE	<i>Protea</i>	<i>venusta</i>		EN		
ROSACEAE	<i>Cliffortia</i>	<i>arborea</i>		VU		
SANTALACEAE	<i>Thesium</i>	<i>marlothii</i>		DDT		
SCROPHULARIACEAE	<i>Manulea</i>	<i>incana</i>		DDD		
SCROPHULARIACEAE	<i>Selago</i>	<i>articulata</i>		LC	X	X



Where LC = Least Concern, DDD = Data Deficient - Insufficient Information, DDT = Data Deficient - Insufficient Information, NT = Near Threatened, VU = Venerable & EN = Endangered.



With regard the MV and 132kV Overhead Lines, the final tower positions and access roads to these pylon positions were unknown, thus a 100m wide corridor was assessed in order to identify potential areas of concern and or the list of protected plants. With the exception of the abundant Aizoaceae (protected), with the number of plants that are in the order of 1000s, only three key plant species, with limited numbers were observed and these included *Aloe microstigma*, *Tylecodon paniculatus* and *Euphorbia mauritanica*. No protected trees, listed in terms of the National Forests Act, were observed on site.



Table 2, below indicates the recommendations that must be considered during construction for site specific areas, while the following general recommendations apply to the whole site:

- Where possible, road alignments and underground trenching operations should try and avoid rock outcrops and or rocky payment areas.
- Any search and rescue operations should be conducted preferably and as far as practically possible before the end of February for the summer flowering species, and a follow -up should be conducted early August for the winter flowering species.

Table 2: Findings of the walkdown surveys for the structures shown in Figure 1 with specific reference to species observed within the development layout only

Structure	Observation	Comment & ID Photo
Wind farm entrance Road 1 & 2, Turbine 1 & 42		
Roads, turbine, hardstands and underground cables	8 – 10 Irises (<i>Moraea miniata</i>) 30 -40 <i>Babiana spp</i> >40 <i>Gethyllis spp</i> 20 <i>Drimia capensis</i>	All listed species can be easily relocated  <i>Babiana spp</i>  <i>Gethyllis spp</i>

Structure	Observation	Comment & ID Photo
		 <p data-bbox="1608 563 1798 598"><i>Drimia capensis</i></p>
Site camp, Road 3a, 4a, b, c, d, e, f and g, 5a, 6a and Turbines 22, 21, 7, 5, 4, 3 and 2		
<p>Roads, turbine, hardstands and underground cables. A significant ridgeline occurs directly west of Road 5a, and this must be protected from any secondary disturbance as it is currently outside of any footprint areas.</p> <p>Note the site camp / laydown is within 10m of the LOW sensitivity drainage line buffer and will require a specific water use authorisation (Possibly under a GA)</p>	<p>6 Irises (<i>Moraea miniata</i>) 80 <i>Babiana spp</i> >40 <i>Gethyllis spp</i> 5 <i>Drimia capensis</i> >1000 <i>Antimima spp</i></p>	 <p data-bbox="1597 978 1809 1013"><i>Antimima pumila</i></p>
Substation (BESS) & OM Buildings		
	<p>10 <i>Babiana spp</i> >20 <i>Gethyllis spp</i> >1000 <i>Antimima spp</i></p>	<p>Extensive rock pavement area near substation</p>

Structure	Observation	Comment & ID Photo
Roads 4 i to t, 7a, 8a, 9a 10a, 11a, 12a, 13a, Turbines 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20		
<p>This portion of the layout covers very similar terrain, up on a ridge line, which has avoided large dolerite outcrops and / or sensitivity areas. Similarly extensive cut and fill areas will also be limited to most of road 4t and 4s.</p>	<p>Species are represented by all the Aizoaceae and those listed above, ranging from 100-1000s of plants. The only unique species observed along the portion of the alignment include the 2 x <i>Euphorbia multifolia</i> near Road 13a but will be avoided by the road alignment</p>	 <p><i>Euphorbia multifolia</i></p>
Northern wind farm entrance, Roads 14a to m, 15a, 16a, 17a, 18a, 21a, 22a, 20a. Turbines 41, 40, 23, 24, 36, 37, 25, 26, 45 and 29		
<p>This portion of the site cover a northern ridgeline, similar in aspect and slope, with a similar suite of plant species.</p> <p>Note the underground cable around Turbine 40 is within 12m of the LOW sensitivity drainage line buffer and will require a specific water use authorisation (Possibly under a GA). Similarly the blade finger area for Turbine 36 is located 10m into drainage line buffer (LOW sensitivity).</p>	<p>Species include all those previously listed above, but due to drier / sunnier conditions on these slopes, the following additional species were also observed</p> <p>>50 <i>Euphorbia hamata</i> 20- 30 <i>Brunsvigia josephinae</i></p>	 <p><i>Brunsvigia spp</i></p>
Internal Medium Voltage (MV) Overhead lines		
<p>Two MV OHL that span the high sensitivity watercourses and wetlands, noting that the remainder of the wind farm layout has avoided these areas.</p>	<p>All species shown in this table were encountered.</p>	
132kV Overhead lines		
<p>132kV OHL will span the high sensitivity watercourses and wetlands, noting that the remainder of the wind farm layout has avoided these areas.</p>	<p>All species shown in this table were encountered, bust mostly dominated by Aizoaceae family species (vygies).</p>	<p>Note a 1km portion of the far western end on the Soetwater WEF site has already been cleared of protected species starting in 2020 and still ongoing.</p>

4. Results – Fauna

In terms of fauna the following are species which potentially occur at the site and are listed as protected species, with those species highlighted in BOLD being observed in this and past assessments:

Schedule 1: Specially Protected Fauna as per the Northern Cape Nature Conservation Act (No 9 of 2009) (NCNCA)

- *Felis nigripes* - Black-footed cat/Miersshooptier
- *Felis silvestris* - African wild cat/Afrika wildekat
- *Ictonyx striatus* - Striped polecat/Stinkmuishond
- *Mellivora capensis* - Honey badger/Ratel
- *Otocyon megalotis* - Bat-eared fox/Bakoorvos
- *Proteles cristatus* – Aardwolf/Maanhaarjakkals
- *Vulpes chama* - Cape fox / Silver jackal Silwervos
- *Orycteropus afer* - Aardvark / Ant-bear Erdvark / Aardvark
- *Atelerix frontalis* – South African hedgehog
- Family: *Chamaeleonidae* - Chamaeleons, all species
- **Family: *Cordylidae* Girdled lizards, all species**

Schedule 2: Protected Species as per the Northern Cape Nature Conservation Act (No. 9 of 2009)

Virtually all indigenous fauna which do not fall under Schedule 1 are classified under Schedule 2 of the NCNCA, except those species classified as pests. In terms of mammals most rodents, shrews, elephant shrews, bats, hares and rabbits, carnivores such as mongoose, genets, and meerkat, antelope such as klipspringer, steenbok, Mountain reedbuck and duiker are included. In terms of other vertebrates, all tortoises, lizards, most harmless snakes and all frogs are listed under Schedule 2. The full list is contained within the Schedule and it not repeated here.

In terms of fauna, the following, *inter alia*, are protected and may not be hunted, captured or harmed without a permit:

- All tortoises [3 species observed which include Angulate tortoise (*Chersina angulate*), Karoo Padloper (*Homopus femoralis*) & Southern Tent Tortoise (*Psammobates tentorius tentorius*)];
- All lizards;
- All frogs;
- Most snakes [4 species have been observed in the past on site, namely Cape cobra (*Naja nivea*), Mole snake (*Pseudoaspis cana*), Karoo sand snake (*Psammophylax rhombeatus rhombeatus*), and Puff adder (*Bitis arietans arietans*)]. The June 2021 period was mainly a cold windy period so no reptiles other than a few of the tortoises and small lizards listed above where observed;
- All indigenous antelope;
- Aardvark;
- Most small carnivores such as Honey Badger, Cape Fox, Bat-eared Fox;
- Large Grey Mongoose etc.; and
- Most birds except pest species.



Girdled lizard (*Karusasaurus polyzonus*; Karoo Girdled Lizard) found near the Southern site entrance

With the exception of the tortoises, lizards and snakes, the species listed above typically leave the area once construction commences, thus permits for the relocation of lizards, snakes and tortoises must be obtained.

5. Conclusion and Recommendations

The report indicates the approximate areas of occurrence of several protected species throughout the development site. However, most of the species are easy to relocate and with a degree of success can be re-established outside of the footprint areas, noting that all of the species are still well represented in areas that won't be disturbed.

During this assessment, it was also indicated that the presence of termites and primates at other sites have resulted in either damage to underground cables or work stoppages when vervet monkeys or baboons climb into the turbine towers.

With regard primates (vervets & baboons) the following recommendations are made:

1. All turbine towers, plant / vehicles and or buildings inclusive of windows must be closed when not being occupied
2. Solid waste and in particular any food waste must be disposed of into the appropriate bins. These bins must be located in waste areas that can be located using primate proof cages. This especially on Sundays or R&R periods when there are limited numbers of staff thus movement and disturbance on site. This will discourage the animals from entering the construction camps in search of food, if the waste is not accessible.
3. Confronting the animals is not recommended, as this usually escalates fear within the primates, which typically become defensive, attack and or bite. Particularly if large males or females with young individuals are present.

In a short review of termite distribution of South Africa, it is evident that the following species are found within the project site with those in bold being observed in the previous surveys:

Harvester termites (Hodotermitidae)

Hodotermes mossambicus = Northern Harvester Termite / Rysmier

Microhodotermes viator = Southern Harvester Termite

Subterranean termites / damp wood termites (Rhinotermitidae)

Psammotermes allocerus = Desert Termite

Fungus-growing termites (Termitidae)

Trinervitermes = Snouted Harvest Termites

Amitermes hastatus = Black-mound Termites

It is not evident if any of the species have the ability or the need to damage the underground cables, but several options are available to deter the termites from tasting. They don't feed on the cables, but test to see if outer casing is edible, which then leads to damage of the insulation and water ingress. The first option is to include a physical barrier, while the second is the use of a chemical barrier. The latter option is used successfully on small sites such as homes, but the potential of soil contamination and secondary poisoning on a larger scale may pose a significant risk, when considering the length of the cables within a wind farm.

The only recommendation that can be made presently based on the information at hand is to install monitoring stations within the site, typically the very sandy areas where the termites are found. Using these small bait

stations will allow for correct identification of the species present, but also allow for the opportunity to place small sections of the proposed cable inside the monitoring system to see if the termites are causing significant damage to the cable outers. These can be placed throughout the site, to assist if required which portions of the underground cables will require physical barriers.

Lastly, a very high number of plants that are protected under Provincial legislation, with some of the species encountered (Aizoaceae) numbering in the thousands are abundant within the region. Table 2 thus lists the number of plants that should be relocated as a percentage of those observed within the affected properties or sites (5-10%). Noting that the majority of these species are adapted to disturbance, while the topsoil will contain a large seed bank. It is therefore important to conserve as much of the stripped topsoil within the sandy area as and when construction commences, as this will aid in rehabilitation in the later construction phases of the project. Similarly, it is anticipated that rock spoil post construction maybe an issue, thus the contractor must allow for time and cost to adequately break down large boulders to create smaller micro habitats for both plants and animals.

The following recommendations are reiterated:

- Vegetation clearing should occur in in a phased manner in accordance with the construction programme to minimise erosion and/or run-off.
- All construction materials including fuels and oil should be stored in demarcated areas that are contained within berms / bunds to avoid spread of any contamination. Washing and cleaning of equipment should also be done in berms or bunds, in order to trap any cement and prevent excessive soil erosion. Mechanical plant and bowsers must not be refuelled or serviced within or directly adjacent to any channel. It is therefore suggested that all construction camps, lay down areas, batching plants or areas and any stores should be more than 34m from any demarcated water courses.
- All cleared areas must be re-vegetated after construction has been completed.
- All alien plant re-growth (mostly forbs) must be monitored, and should it occur, these plants should be eradicated. The scale of the operation does however not warrant the use of a Landscape Architect and / or Landscape Contractor.

6. Appendix 1 - Specialist CV

CURRICULUM VITAE

- **Dr Brian Michael Colloty**

- **7212215031083**

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Pari Park

Port Elizabeth, 6070

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083 498 3299

Profession: Ecologist (Pr. Sci. Nat. 400268/07)

Member of the South African Wetland Society

Specialisation: Ecology and conservation importance rating of inland habitats, wetlands, rivers & estuaries

Years experience: 25 years

SKILLS BASE AND CORE COMPETENCIES

- 25 years experience in environmental sensitivity and conservation assessment of aquatic and terrestrial systems inclusive throughout Africa. Experience also includes biodiversity and ecological assessments with regard sensitive fauna and flora, within the marine, coastal and inland environments. Countries include Mozambique, Kenya, Namibia, Central African Republic, Zambia, Eritrea, Mauritius, Madagascar, Angola, Ghana, Guinea-Bissau and Sierra Leone. Current projects also span all nine provinces in South Africa.
- 15 years experience in the coordination and management of multi-disciplinary teams, such as specialist teams for small to large scale EIAs and environmental monitoring programmes, throughout Africa and inclusive of marine, coastal and inland systems. This includes project and budget management, specialist team management, client and stakeholder engagement and project reporting.
- GIS mapping and sensitivity analysis

TERTIARY EDUCATION

- 1994: B Sc Degree (Botany & Zoology) - NMU
- 1995: B Sc Hon (Zoology) - NMU
- 1996: M Sc (Botany - Rivers) - NMU
- 2000: Ph D (Botany – Conservation Rating Systems (wetlands) – NMU

EMPLOYMENT HISTORY

- 1996 – 2000 Researcher at Nelson Mandela University – SAB institute for Coastal Research & Management. Funded by the WRC to develop estuarine importance rating methods for South African Estuaries

- 2001 – January 2003 Training development officer AVK SA (reason for leaving – sought work back in the environmental field rather than engineering sector)
- February 2003- June 2005 Project manager & Ecologist for Strategic Environmental Focus (Pretoria) – (reason for leaving – sought work related more to experience in the coastal environment)
- July 2005 – June 2009 Principal Environmental Consultant Coastal & Environmental Services (reason for leaving – company restructuring)
- June 2009 – August 2018 Owner / Ecologist of Scherman Colloty & Associates cc
- August 2018 Owner / Ecologist - EnviroSci (Pty) Ltd

SELECTED RELEVANT PROJECT EXPERIENCE

World Bank IFC Standards

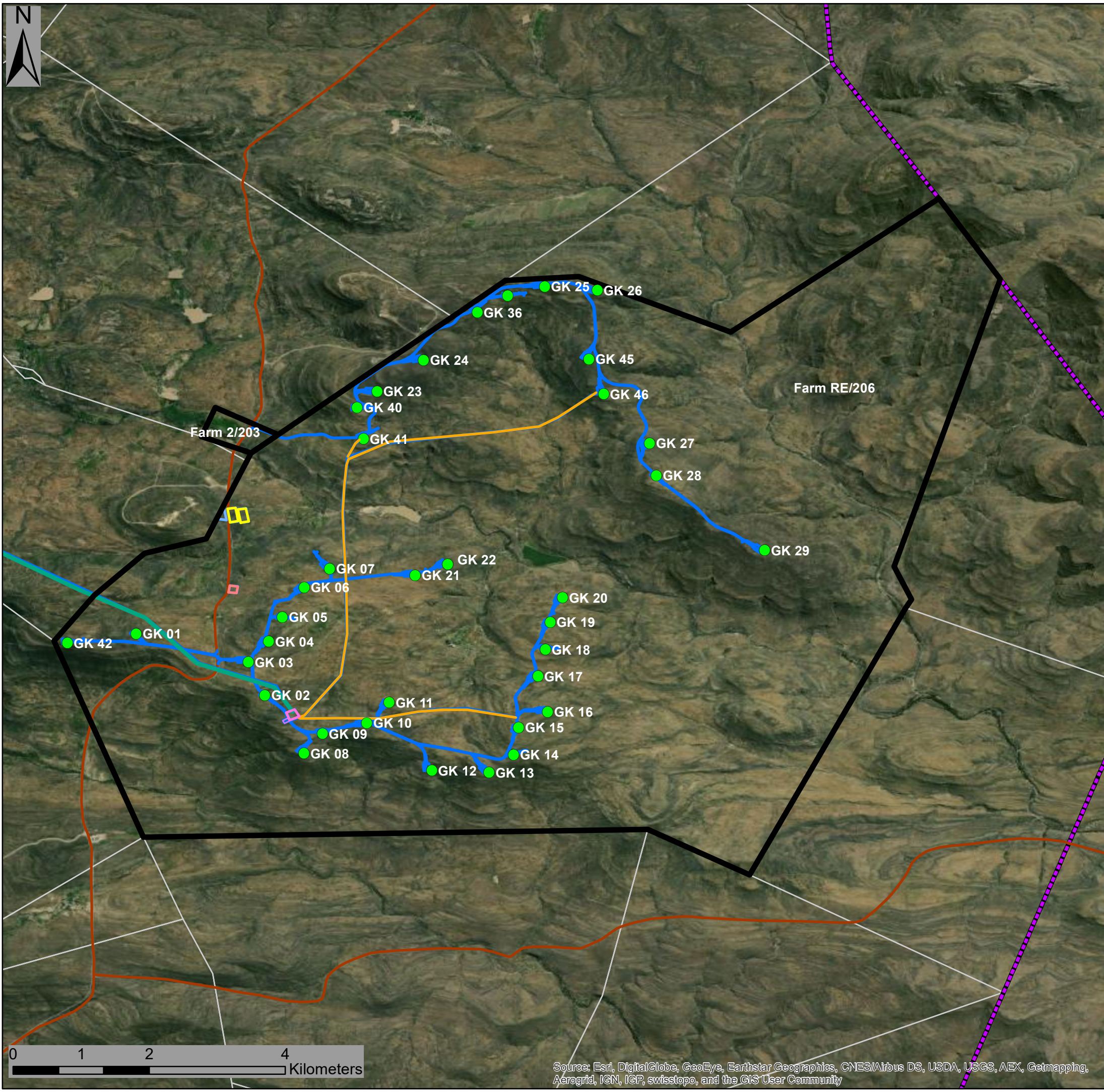
- Botswana South Africa 400kv transmission line (400km) biodiversity assessment on behalf of Aurecon - current
- Farim phosphate mine and port development, Guinea Bissau – biodiversity and estuarine assessment on behalf of Knight Piesold Canada – 2016.
- Tema LNG offshore pipeline EIA – marine and estuarine assessment for Quantum Power (2015).
- Colluli Potash South Boulder, Eritrea, SEIA marine baseline and hydrodynamic surveys co-ordinator and coastal vegetation specialist (coastal lagoon and marine) (on-going).
- Wetland, estuarine and riverine assessment for Addax Biofeuls Sierra Leone, Makeni for Coastal & Environmental Services: 2009
- ESHIA Project manager and long-term marine monitoring phase coordinator with regards the dredge works required in Luanda bay, Angola. Monitoring included water quality and biological changes in the bay and at the offshore disposal outfall site, 2005-2011

South African

- Plant search and rescue, for NMBM (Driftsands sewer, Glen Hurd Drive), Department of Social Development (Military veterans housing, Despatch) and Nxuba Wind Farm, - current
- Wetland specialist appointed to update the Eastern Cape Biodiversity Conservation Plan, for the Province on behalf of EOH CES appointment by SANBI – current. This includes updating the National Wetland Inventory for the province, submitting the new data to CSIR/SANBI.
- CDC IDZ Alien eradication plans for three renewable projects Coega Wind Farm, Sonop Wind Farm and Coega PV, on behalf of JG Afrika (2016 – 2017).
- Nelson Mandela Bay Municipality Baakens River Integrated Wetland Assessment (Inclusive of Rehabilitation and Monitoring Plans) for CEN IEM Unit - Current
- Rangers Biomass Gasification Project (Uitenhage), biodiversity and wetland assessment and wetland rehabilitation / monitoring plans for CEM IEM Unit – current.
- Gibson Bay Wind Farm implementation of the wetland management plan during the construction and operation of the wind farm (includes surface / groundwater as well wetland rehabilitation & monitoring plan) on behalf of Enel Green Power - current
- Gibson Bay Wind Farm 133kv Transmission Line wetland management plan during the construction of the transmission line (includes wetland rehabilitation & monitoring plan) on behalf of Eskom – 2016.
- Tsitsikamma Community Wind Farm implementation of the wetland management plan during the construction of the wind farm (includes surface / biomonitoring, as well wetland rehabilitation & monitoring plan) on behalf of Cennergi – completed May 2016.
- Alicedale bulk sewer pipeline for Cacadu District, wetland and water quality assessment, 2016
- Mogalakwena 33kv transmission line in the Limpopo Province, on behalf of Aurecon, 2016
- Cape St Francis WWTW expansion wetland and passive treatment system for the Kouga Municipality, 2015
- Macindane bulk water and sewer pipelines wetland and wetland rehabilitation plan 2015

- Eskom Prieska to Copperton 132kV transmission line aquatic assessment, Northern Cape on behalf of Savannah Environmental 2015.
- Joe Slovo sewer pipeline upgrade wetland assessment for Nelson Mandela Bay Municipality 2014
- Cape Recife Waste Water Treatment Works expansion and pipeline aquatic assessment for Nelson Mandela Bay Municipality 2013
- Pola park bulk sewer line upgrade aquatic assessment for Nelson Mandela Bay Municipality 2013
- Transnet Freight Rail – Swazi Rail Link (Current) wetland and ecological assessment on behalf of Aurecon for the proposed rail upgrade from Ermelo to Richards Bay
- Eskom Transmission wetland and ecological assessment for the proposed transmission line between Pietermaritzburg and Richards Bay on behalf of Aurecon (2012).
- Port Durnford Exxaro Sands biodiversity assessment for the proposed mineral sands mine on behalf of Exxaro (2009)
- Fairbreeze Mine Exxaro (Mtunzini) wetland assessment on behalf of Strategic Environmental Services (2007).
- Wetland assessment for Richards Bay Minerals (2013) – Zulti North haul road on behalf of RBM.
- Biodiversity and aquatic assessments for 125 renewable projects in the past 9 years in the Western, Eastern, Northern Cape, KwaZulu-Natal and Free State provinces. Clients included RES-SA, RedCap, ACED Renewables, Mainstream Renewable, GDF Suez, Globeleq, ENEL, Abengoa amongst others. Particular aquatic sensitivity assessment and Water Use License Applications on behalf of Mainstream Renewable Energy (8 wind farms and 3 PV facilities.), Cennergi / Exxaro (2 Wind farm), WKN Wind current (2 wind farms & 2 PV facilities), ACED (6 wind farms) and Windlab (3 Wind farms) were also conducted. Several of these projects also required the assessment of the proposed transmission lines and switching stations, which were conducted on behalf of Eskom.
- Vegetation assessments on the Great Brak rivers for Department of Water and Sanitation, 2006 and the Gouritz Water Management Area (2014)
- Proposed FibreCo fibre optic cable vegetation assessment along the PE to George, George to Graaf Reinet, PE to Colesburg, and East London to Bloemfontein on behalf of SRK (2013-2015).

7. Appendix 2: Layout Map



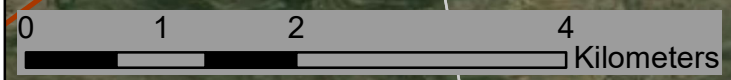
Great Karoo Wind Energy Facility

Combined Layout

Legend

- Turbine
- Overhead MV cables
- Secondary Roads
- Site roads & underground MV cables
- 132kV OHL (seperate authorisation)
- Turbine Component Laydown Area
- Substation
- Site Camp
- O&M
- Concrete Batch Plant
- Provincial Boundary
- Farm Portion
- Wind Farm

Scale: 1: 50 000
 Projection: LO19
 Map ref: Great Karoo Layout Map



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

