





SOUTH AFRICA MAINSTREAM RENEWABLE POWER DROOGFONTEIN PV 3 (PTY) LTD

AMENDMENT APPLICATION TO THE ENVIRONMENTAL AUTHORISATION FOR THE PROPOSED 75MW DROOGFONTEIN PHOTOVOLTAIC SOLAR ENERGY FACILITY, LOCATED IN THE SOL PLAATJIE LOCAL MUNICIPALITY, FRANCES BAARD DISTRICT MUNICIPALITY IN THE NORTHERN CAPE PROVINCE OF SOUTH AFRICA

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prepared by: SiVEST Environmental

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Glossary of Terms

Archaeological resources: This includes:

- material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years including artefacts, human and hominid remains and artificial features and structures;
- rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation;
- wrecks, being any vessel or aircraft, or any part thereof which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the republic as defined in the Maritimes Zones Act, and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation;
- Features, structures and artefacts associated with military history which are older than 75 years and the site on which they are found.

Alluvial: Resulting from the action of rivers, whereby sedimentary deposits are laid down in river channels, floodplains, lakes, depressions etc

Biodiversity: The variety of life in an area, including the number of different species, the genetic wealth within each species, and the natural areas where they are found.

Cultural significance: This means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance

Cumulative Impact: In relation to an activity, cumulative impact means the impact of an activity that in itself may not be significant, but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

The "Equator Principles": A financial industry benchmark for determining, assessing and managing social & environmental risk in project financing.

Environmental Impact Assessment: In relation to an application, to which Scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of the application.

Environmental Impact Report: In-depth assessment of impacts associated with a proposed development. This forms the second phase of an Environmental Impact Assessment and follows on from the Scoping Report.

Environmental Management Programme: A legally binding working document, which stipulates environmental and socio-economic mitigation measures that must be implemented by several responsible parties throughout the duration of the proposed project.

Ephemeral: When referring to a stream or drainage line, it refers to the flow characteristics by which only periodic surface flows typically occur. Similarly when referring to a pan or depression, this would be characterised by only periods of time when surface water occurs within it, usually associated with the rainy season.

ESRI is a software development and services company providing Geographic Information System (GIS) software and geodatabase management applications.

Heritage resources: This means any place or object of cultural significance. See also archaeological resources above

Hyrdomorphic / hydric soil: Soil that in its undrained condition is saturated or flooded long enough during the growing season to develop anaerobic conditions favouring growth and regeneration of hydrophytic vegetation. These soils are found in and associated with wetlands.

Kilovolt (kV): a unit of electric potential equal to a thousand volts (a volt being the standard unit of electric potential. It is defined as the amount of electrical potential between two points on a conductor carrying a current of one ampere while one watt of power is dissipated between the two points).

Macro-geomorphological: Related to / on the scale of geomorphic provinces. A geomorphic province is a spatial entity with common geomorphic attributes.

Precipitation: Any form of water, such as rain, snow, sleet, or hail that falls to the earth's surface.

Red Data species: All those species included in the categories of endangered, vulnerable or rare, as defined by the International Union for the Conservation of Nature and Natural Resources.

Riparian: The area of land adjacent to a stream or river that is influenced by stream induced or related processes.

List of Abbreviations

AIA	Archaeological Impact Assessment
C&RR	Comments and Response Report
CPV	Concentrating Photovoltaic
BID	Background Information Document
DEA	Department of Environmental Affairs
DEIR	Draft Environmental Impact Report
DEAT	Department of Environmental Affairs and Tourism (currently known as DEA)
DSR	Draft Scoping Report
DWA	Department of Water Affairs
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMPr	Environmental Management Programme
ENPAT	Environmental Potential Atlas
EP	Equator Principles
EPFI	Equator Principles Financial Institutions
EWT	Endangered Wildlife Trust
FEIR	Final Environmental Impact Report
FGM	Focus Group Meeting
FSR	Final Scoping Report
GHG	Greenhouse gas
GIS	Geographic Information System
HIA	Heritage Impact Assessment
l&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IFC	International Finance Corporation
IPP	Independent Power Producer
IUCN	International Union for the Conservation of Nature and Natural Resources
IRP	Integrated Resource Plan
IUCN	International Union for the Conservation of Nature and Natural Resources
KSW	Key Stakeholder Workshop
kV	Kilo Volt
LSA	Late Stone Age
LM	Local Municipality
MAP	Mean Annual Precipitation
MW	Megawatt
MWp	Megawatt peak
NCDTEC	Northern Cape Department of Tourism, Environment and Conservation
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)

NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NERSA	National Energy Regulator of South Africa
NGO	Non-Government Organisations
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NSD	Potential Noise-Sensitive Development
NWA	National Water Act, 1998 (Act No. 36 of 1998)
PM	Public Meeting
PPA	Power Purchase Agreement
PPP	Public Participation Process
PSRs	Potentially Sensitive Receptors
PV	Photovoltaic
REFIT	Renewable Energy Feed-In Tariff
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SAWS	South African Weather Service
SIA	Social Impact Assessment
SKA	Square Kilometre Array
WESSA	Wildlife and Environment Society of South Africa

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DRAFT PART 1 ADDITIONAL INFORMATION REPORT

1 INTRODUCTION

1.1 Background

South Africa Mainstream Renewable Power Droogfontein PV 3 (Pty) Ltd (hereafter referred to as "Mainstream") was issued with an Environmental Authorisation (EA) for the proposed 75MW Droogfontein Photovoltaic (PV) Solar Energy Facility (SEF), located in Kimberly within the Sol Plaatjie Local Municipality, Frances Baard District Municipality in the Northern Cape Province of South Africa on September 2012 (DFFE Reference No.: 12/12/20/2024/1/1).

Subsequent to the issuing of the original EA in September 2012, the following amendments have been undertaken and granted for the authorised SEF:

- The EA was amended on 19 September 2013 to change the details of the Environmental Authorisation holder (DFFE Reference No.: 12/12/20/2024/1/1/AM1).
- The EA was amended on 19 of June 2015 to extend the validity period of the EA and to change the contact details of the EA holder (DFFE Reference No.: 12/12/20/2024/1/1/AM2).
- The EA was amended on 11 August 2017 in order to extend the validity of the EA (DFFE Reference No.: 12/12/20/2024/1/1AM3).
- The EA was amended on 02 September 2020 in order to extend the validity of the EA (DFFE Reference No.: 12/12/20/2024/1/1AM4).

The Droogfontein Photovoltaic (PV) Solar Energy Facility is to be constructed within the project site which comprises the following farm portion:

• Portion 1 of the farm Droogfontein No. 62

The following infrastructure have been authorised by the DFFE:

- Photovoltaic (PV) panels array with a maximum 320 000 panels
- Concrete or screw pile foundations used to support the panel arrays
- The panel arrays (between 5m and 10m high) footprint of approximately 15m x 4m in area

- A single storey building with warehouse / workshop space & access (eg. 8m high, 20m long, 20m wide)
- The distribution substation of approximately 90m x 120m in size and inverters between 75 and 93
- An access road with a gravel surface from the public road onto the site
- A 5m high permanent solar resource measuring station which will measure 100m2 to measure incoming solar radiation levels on site.
- A lay down area of maximum of 10000m2 adjacent to the site or access route and a contractors site offices which will require a maximum of 5000m2

1.2 Motivation

The key motivating factor for the request to amend the EA validity period, is to ensure that the applicant has a project that is compliant with the requirements of the Department of Mineral Resources and Energy ("DMRE") (previously the Department of Energy) Renewable Energy Independent Power Producer Procurement ("REIPPP") Programme. Due to various reasons, outside of the Applicant's control, the planned announcements and roll-out of bidding rounds have not occurred as previously planned for. As a result, the REIPPP Programme has been delayed, resulting in the project not yet being selected as a preferred bidder, further necessitating the need for the EA validity period to be extended.

Extension of the validity of the EA will ensure that the EA remains valid for the undertaking of the authorised activities such that the project can be bid into future bidding rounds of the REIPPP Programme or similar programmes.

Between 2011 and 2015, 302 bids were submitted in support of the REIPPP Programme with around 30% (92) of the projects being awarded. Following these bid rounds, there was a significant delay in the signing of Power Purchase Agreements by Eskom, and as a result no further bid rounds were opened between 2015 and 2021. It is well understood that the nature of this bidding process is highly competitive, and that bid windows have been planned for 2023. However, there is some uncertainty around the planned bid window submission and award dates, and as has been shown in the past, these dates may change at short notice, and impact on the Applicant's ability to participate in the process, as this EA validity as it currently stands lapses in 2022.

For this reason, application is being sought to extend the current validity of the EA.

1.3 Expertise of Environmental Assessment Practitioner

SiVEST has considerable experience in the undertaking of EIAs. Staff and specialists who have worked on this project and contributed to the compilation of this Environmental Impact Report are detailed in Table 1 below.

Table '	1:	Project Team
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Name and Organisation	Role
Natalie Pullen – SiVEST Environmental	Project Leader

Name and Organisation	Role				
Division					
Rendani Rasivhetshele – SiVEST	Report compilation				
Environmental Division					
David Hoare – David Hoare Consulting	Biodiversity (Flora and Fauna)				
Chris van Rooyen – Chris van Rooyen	Avifauna				
Consulting					
Bruce Scott-Shaw – NatureStamp	Surface water				
Johann Lanz – Johann Lanz	Soils and Agricultural Potential				
Kerry Schwartz – SLR	Visual				
Wouter Fourie – PGS Heritage	Heritage				
Lloyd McFarlane - ACER (Africa)	Social				
Environmental Consultants					
Duan Swart - GaGE Consulting	Geotechnical				
Ntuthuko Hlanguza – SiVEST Civil	Transportation				
Engineering Division					
Siphiwokuhle Buthelezi – SiVEST	GIS and Mapping				
Environmental Division					
Hlengiwe Ntuli – SiVEST Environmental	Public participation				
Division					

2 BASELINE STATUS OF THE RECEIVING ENVIRONMENT ASSESSED THROUGH THE EIA PROCESS (EIA REPORT 2012)

The Northern Cape Province is considered to be the most suitable region for the establishment of solar plants CPV/ PV due to the good solar resource. Mainstream is proposing the establishment of a Concentrating Photovoltaic (CPV) / Photovoltaic (PV) plant in Kimberley, Northern Cape Province.

2.1 Locality

The study area is situated, approximately 15km north of the town of Kimberley in Sol Plaatje Local Municipality, Northern Cape Province. The study area which is 278Ha is located on portion 1 of the Farm Droogfontein 62.



Figure 1: Regional Locality



Figure 2: Site Locality Map

2.2 Study Area Description

The study area is characterized by large areas of natural vegetation, covered by shrublands. The site is classified as "natural" having relatively little human infrastructure on it and is used as grazing land for cattle and sheep herds. Open grazing land is interspersed with two ephemeral pans in the south-eastern part of the study area. The pans are sensitive habitats for birds and may be prone to seasonal inundation.

There are existing transmission lines of 275kV, 132kV, 66kV and 11kV traversing diagonally across the site. There is also a railway infrastructure that traverses adjacent to the southern boundary of the study area in the east-west direction.

Residential, agriculture and some mining (diamond mines, nevertheless four De Beers Mines are closed) land uses surround the study area. According to the ENPAT data, sourced from DEAT (2001), the study area and immediate surrounding areas are characterised by natural vegetation

AThe N12 (which is a portion of the diamond route) runs along the eastern side of the study area. To the south of the site is Kamfers Dam (400Ha in size) a permanent and large pan which is a sensitive habitat with high ecological importance and should be protected. This dam is the home to up to 50 000 Lesser Flamingoes (*Phoeniconaias minor*). According to Barnes (2000), the Lesser Flamingo which is listed as a Near Threatened species requires shallow eutrophic saline and alkaline wetlands such as saltpans and sheltered coastal lagoons (Brown *et al.*, 1982). The Vaal River forms the northern boundary of the study area. Centre pivot irrigation schemes are prominent to the north-west of the study area and along the banks of the Vaal River (

The Riverton Road and the railway line are located to the east of the study area. The Riverton Road located closer to the boundaries of the study area borders to the east.

The Dronfield Nature Reserve is located directly to the south-east of the study area and across the N12.

2.3 Climate

The study area has a semi-arid continental climate with a summer rainfall regime i.e. most of the rainfall is confined to summer and early autumn. Mean Annual Precipitation (MAP) is approximately 392mm per year and without some form of supplementary irrigation natural rainfall is generally insufficient to produce sustainable harvests for cultivated crops. This is reflected in the limited dry land crop production within the study area. Precipitation usually takes the form of infrequent thundershowers. Average daily temperatures range from 25°C in summer to 10 °C in winter. Average night time temperatures drop to around 0.3 °C during winter (**Table 2**).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
MAP	58	62.9	67.5	41.1	18	6.7	4.4	6	13.1	27.5	38.2	48.1	392
(mm)													
MAT	24.7	23.6	21.3	17.5	13.4	10.1	10.2	12.8	16.6	19.7	21.9	24	18
(°C)													

 Table 2: Mean Monthly and Annual Precipitation and Temperature for Kimberley (SAWS

 (South African Weather Service), 2010)

2.4 Biodiversity (including fauna, flora and avi-fauna)

2.4.1 Flora in the study area

The prominent plant of concern within the study area is the Camel thorn (*Acacia erioloba*) which is common throughout the area. This is a protected tree species in terms of the National Forest Act, 1998 (Act No. 30 of 1998). Several of these trees are present on the site. Mitigation measures will thus need to be included within the EMPr and a permit applied for with the Department of Agriculture, Forestry and Fisheries (DAFF) should any of these species be affected.

Kimberley Thornveld

This vegetation type is characterised by rolling topography but more often very flat. A well developed tree layer is present dominated by Camel thorn (*Acacia erioloba*), Umbrella thorn (*Acacia tortillis*) and Shepherds tree (*Boscia albitrunca*). Grass is present however a large amount of exposed soil is present.

Larger dominant species include Acacia mellifera, Tarchonanthus camphoratus, Rhus lancea, Ehretia rigida and Diospyros pallens. The herb layer is dominated by Acacia hebeclada, Euclea crispa, Hermannia comosa, Melolobium microphyllum and Aloe hereroensis.

Grass species occurring include Eragrostis lehmanniana, Aristida congesta, Cymbopogon posposchilii, Digitaria eriantha, Enneapogon cenchroides, Themeda triandra and Eragrostis rigidior.

The vegetation type is considered to be Least Threatened with 82.3% remaining however only 2% has been formally protected.

2.4.2 Fauna in the study area

Friedman & Daly, (2004) list several red data mammal species that could potentially occur in the study area e.g. the South African Hedgehog (*Atelerix frontalis*), Brown Hyaena (*Hyaena brunnea*) and the Honey Badger (*Mellivora capensis*) which listed as Near Threatened. Several of the

species recorded for the study area are not likely to occur to the anthropogenic activities such as fencing etc that have taken place.

Two Important Bird Areas (IBAs) are in close proximity to the study area and bird life in the area is fairly diverse (SABAP 2). African White Backed Vultures (*Gyps africanus*) were noted to be breeding on the site.

The African Giant Bullfrog (*Pyxicephalus adspersus*), a Red Data species has been recorded in the large pan on the site (*pers comm*.).It occurs in seasonal shallow grassy pans, vleis and other rain filled depressions in open flat areas of grassland or savanna (Du Preez and Carruthers, 2009). This species is considered to be Near Threatened as its specialized habitat is at risk from increasing urbanization and agricultural activity (Du Preez and Carruthers, 2009).

Invertebrate information for the study area is limited although several species are anticipated to be present.

2.5 Surface Water

2.5.1 Drainage Context

The general area falls within Quaternary Catchment C91E. In a macro-geomorphological context, the Study Area is located in a transition area between two Geomorphic Provinces (Lower Vaal and Orange Geomorphic Province and Highveld Geomorphic Province). Geomorphic Provinces have been developed as a way to classify similar areas of surface water drainage and are defined as similar areas containing a limited range of recurring landforms that reflect comparable erosional, climatic and tectonic histories (Partridge *et al.* 2010).

The boundary of the two Geomorphic provinces traverses the study site diagonally. Therefore, while the north-western half of the study area falls under the Lower Vaal and Orange Geomorphic Province, the south-eastern half falls under the Highveld Geomorphic Province. The boundary in the geomorphic provinces reflects a distinction in hydrological characteristics that occurs across the study area.

2.5.2 Surface Water Resource Occurrence in the Study Area

The wider study area is characterised by water resources such as the Vaal River, Kamfers dam as well as several non-perennial pans which are located outside the boundaries of the proposed PV study site. The very flat nature of the topography is a strong factor in influencing the nature of surface water occurrence in the wider study area as described above.

The Vaal River which is located about 4km north of the proposed CPV/ PV site has an overall catchment of 196 438 km² and has a runoff of 3 929 million m³/year (DEAT, 1999). The River rises on the western slopes of the Drakensberg escarpment and flows approximately 900km

west-south-west across the interior plateau and joins the Orange River near Douglas. The major tributaries of the Vaal drain the Drakensberg in the east, the Witwatersrand in the north and the Maluti Mountains in the south (Braune & Rogers, 1987). The river is controlled through the Vaal Dam, the Vaal Barrage and Bloemhof Dam. While it provides water through water transfer schemes to the Crocodile and Olifants Rivers, it receives water from the Assegaai, Buffalo, Tugela, Orange and Senqu Rivers (DEAT, 1999).

The small ephemeral pans distributed outside the study area are considered sensitive landscape features of the site, as they appear to be associated with avifauna and amphibian species and have been avoided.

Further south, approximately 14.7km outside the study area, is Kamfers Dam which measures 500ha in size. Kamfers Dam is thought to have previously been an ephemeral pan, only being inundated during high rainfall periods. It is now permanently inundated due to the constant inputs of effluent water from Kimberley in addition to the stormwater runoff from Kimberley through the Municipality's reticulation system. The dam probably supports the largest permanent population of Lesser Flamingos (*Phoeniconaias minor*) in Southern Africa with sometimes more than 80,000 individuals present (Anderson & Anderson, 2010).

2.6 Agricultural Potential

According to the ENPAT database the Droogfontein Site is dominated by red apedal soils formed from sedimentary parent material. These well drained soils are associated with a high base status (an indicator of good fertility), lack of well formed peds and are weakly structured. The study area is classified as having a moderate soil depth which is generally between 0.45 and 0.75m deep.

The ENPAT Database also provides an overview of the study area's agricultural potential based on its soil characteristics, it should be noted this spatial dataset does not take *prevailing climate into account*. Restrictive climate characteristics, due to heat and / or moisture stress will further reduce the agricultural potential of the area under assessment. The study area is dominated by soils which have a poor suitability for arable agriculture. The north-western portion of the study area, along the bank of the Vaal, is classified as having soils with an intermediate suitability for arable agriculture and this zone corresponds to an increase in cultivated lands and crop production when compared to the land found further to the south-east

By taking all the site characteristics (climate, geology, land use, slope and soils) into account the agricultural potential for the majority of the study area is classified as being low for crop production while moderate for grazing.

The site can be classified as having a low agricultural value and is replaceable when assessed within the context of the proposed development. Consequently, the overall impact of the Solar

Energy Facility on the study area's agricultural potential and production will be negligible due to the site's low inherent agricultural potential.

2.7 Groundwater

The proposed site is located in quaternary catchment C91E, within Water Management Area 10 (Lower Vaal). The site is underlain mainly by a varying thickness of the Kalahari Sand Formation (Error! Reference source not found.), which is in turn underlain by rocks of the Karoo S upergroup and the Ventersdorp Supergroup. Outcrops of the Ventersdorp Supergroup occur in the middle part of the site, suggesting that the Kalahari Sands may be very thin elsewhere over the site. The General Series Hydrogeology Maps of South Africa (sheet 2722 Kimberley) classify the aquifers (the solid rocks rather than the sands) underlying the site area as "b3", meaning a fractured aguifer with median borehole yield (excluding recorded dry boreholes) of 0.5 to 2.0 litres per second (Error! Reference source not found.). See Vegter (1995) for more details. The h ydrogeology maps classify the geology of the site as "argillaceous", meaning a fine-grained sedimentary rock. These rocks are expected to be Minor Aquifers, with groundwater storage and flow being mainly via secondary features such as fractures, faults and bedding planes. The Groundwater Harvest Potential Map of South Africa published by the Department of Water Affairs (Baron et al, 1998) classifies the area around Kimberley has having a harvest potential of 6000 to 10000 m³/km²/annum, defined as the maximum volume of groundwater that may annually be abstracted per square kilometer per annum without depleting the aquifers.

2.8 Visual

2.8.1 *Physical Landscape Characteristics*

As part of the visual characterisation, the physical landscape characteristics are described in terms of the prevailing topography, vegetation cover and landuse in the study area.

Topography

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Generally speaking, the study area is characterised by a relatively flat, topographically featureless landscape which slopes down gradually in a north-westerly direction towards the Vaal River Valley (**Error! Reference source not found.**). Variations in the topographical uniformity occur in t he form of localised high points and ridges in the north and south-east of the site and slightly lower ground in the south-western portion of the site. The generally flat nature of the southern part of the site is indicated by the presence of a number of pans which only occur where the topography is too flat for surface drainage to flow away from the area.

Visual Implications

The relatively flat topography on the site will result in typically wide-ranging vistas of the site, especially from locally higher elevations.

Vegetation

The dominant vegetation unit in the study area is Kimberley Thornveld, which is characterised by a well developed tree and shrub layer with an underlaying grass layer (Mucina and Rutherford, 2006). Much of this natural vegetation has however been previously cleared and replaced by open grasslands for agricultural purposes, except in the south-western parts of the site where natural thornveld vegetation is still present.

Visual Implications

The short open grasslands will promote wide open vistas of the proposed site. Where natural trees and shrubs are still present they will restrict views and effectively screen objects that are the same height or lower.

Landuse

Most of the natural vegetation has been cleared from the proposed site and replaced by grassy plains used as grazing land for cattle. The surrounding area has been partly transformed by urban and suburban environments, with the town of Riverton directly to the north-east of the site along the Vaal River and the community of Roodepan situated to the south-west of the site. Intensive commercial agriculture occurs adjacent to the Vaal River, in and to the north of the site and mining activities which belong to the De Beers Consolidated Mines Ltd mostly occur to the south-east. Kimberley is the largest urban area and is located approximately 7km to the south of the site.

Visual Implications

Clearance of the natural vegetation for urban and suburban land uses has partially transformed the natural visual character and resulted in wide open vistas.

Visual Character

The above physical landscape characteristics as well as the presence of built infrastructure influences the visual character of the study area. Visual character is defined based on the level of transformation from a completely natural setting (little evidence of human transformation), with varying degrees of transformation engendering different visual characteristics.

Most of the study area is considered to have a natural visual character with certain parts displaying a pastoral component where pasture land occurs, therefore introducing a solar field into this largely natural context is likely to alter the 'sense of place'.

Human infrastructure within the proposed site occurs at a low density and includes; transmission lines which traverse the site, the railway line along the western, southern, and eastern boundary, the road to Riverton adjacent to the north-eastern boundary and the N12 highway on the eastern boundary. The surrounding landscape is relatively undisturbed with human transformation limited to agriculture and mining activities, scattered residential settlements, the N12 highway and the R31 to Barkly West. The Dronfield Nature Reserve is located directly to the south-east of the site and contributes to the natural scenic character of the area by conserving the natural thornveld vegetation.

At present the area is largely undeveloped with a low density of human habitation and therefore the proposed solar energy facility is likely to degrade the natural visual character of the area. A large residential development, known as Northgate, has however been planned approximately 3km south of the proposed solar energy facility. Once erected, this residential development will increase the urban footprint and is likely to degrade the natural visual character of the study area.

Visual Absorption Capacity

The visual absorption capacity (VAC) of an area / landscape refers to the ability of the area / landscape to absorb the development without any noticeable intrusion or change to the visual character of the area. It is measured on a scale from high (an area which has a high capacity to absorb the development) to low (an area in which a development would be highly visible). It is a function of topography, landuse and land cover, with urban areas having a high VAC and natural areas having a low VAC.

The area surrounding the proposed site has a largely natural visual character, with a very low density of human settlement. The wooded component of the natural vegetation will impede views toward the site from several places along the N12. The majority of the study area is assigned a moderate VAC value as these trees and shrubs are scattered and will offer incomplete visual screening.

2.8.2 Visual Sensitivity

Visual Sensitivity is expressed as the sensitivity of an area to a proposed development which could be perceived as a visual impact. It is based on the, VAC, presence of existing infrastructure and visual character in an area, but also relates to the spatial distribution of potential receptors and likely value judgement of these receptors based on the perceived aesthetic appeal of an area. It is categorised as **high** (visually intrusive, negatively perceived by receptors), **moderate** (receptors present, limited negative perception) or **low** (little opposition, not negatively perceived).

The table below explores in more detail the inputs into categories of visual sensitivity:

Visual	Visual	Presence and	Presence	Visual	Other factors
Sensitivity	Absorption	size of	of	Character	influencing
Category	Capacity	Existing	Sensitive		visual sensitivity
		Infrastructure	Receptors		
High	Low	Absent or at	Present	-Natural /	- Areas of natural
		very low		largely	vegetation
		densities		natural	(conserved)
				-Rural /	-Practice of
				pastoral	economic
					activities (esp.
					tourism) which
					place value on the
					scenic / beauty
					character of the
					area
Moderate	Moderate	Present – not	Present	-Rural /	
		high densities		pastoral	
				-Urban	
Low	High	Present – high	Absent	-Urban	
		densities,		-Industrial	
		often a very			
		large or tall			

 Table 3: Environmental factors used to define visual sensitivity classes

As discussed above, the study area has a largely natural visual character, a low density of human infrastructure and a moderate VAC. Moreover, from a tourism perspective the N12 which is an important tourism route (Diamond Route) and the Dronfield Nature Reserve are distant from the proposed PV site. However, Riverton road, is potentially used by tourists travelling towards the Riverton Pleasure visual Resort. Due to these factors the area is categorised as having a low visual sensitivity.

2.9 Heritage

2.9.1 Archival findings

Archaeology

At present no data could be obtained from the McGregor Museum on archaeological sites in and around the study area.

Nooitgedacht Rock Art Site

This National Monument is situated on the farm Nooitgedact (adjacent to the farm Droogfontein) and contains 3 sections of glaciated pavement with over 250 Bushman and Khoe rock engravings (Figure 3).



Figure 3: (Khoi)San Engraving of and Eland on glacial pavement at Nooitgedacht (http://commons.wikimedia.org/wiki/File:Rock_Art_at_Nooitgedacht.jpg)

South African War

A study of archival information indicates the presence of the redoubts and encampments of the Boer forces during the South African war of 1899-1902 just outside the study area. This is discussed in detail in the Heritage Assessment Report.

An area southern western of the study area is close to an Intermediate pumping station which was the area where the Head Quarters of the Boer command were established during the siege while the south eastern section is close to the vicinity of the low ridge just north of the Falstead farm where a set of boer redoubts where positioned (**Error! Reference source not found.**).

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Figure 4: – Archival map of Kimberley Sieg - Georeferenced for plotting historical positions (www.boerwar.com)



Figure 5: – Boer positions in relation to study area in red

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2.9.2 Palaeoentological Heritage

The fossil heritage recorded within each of the main sedimentary rock successions represented within the Droogfontein study region north of Kimberley is outlined in the Heritage Assessment Report. See also the summary of fossil heritage provided below.

GEOLOGICAL UNIT	ROCK TYPES & AGE	FOSSIL HERITAGE	PALAEONT- OLOGICAL SENSITIVITY	RECOMMENDED MITIGATION
Gordonia Formation <i>etc</i> KALAHARI GROUP	unconsolidated to semi-consolidated aeolian sands, locally calcretized at depth QUATERNARY	Calcretised rhizoliths & termitaria, ostrich egg shells, land snail shells, rare mammalian and reptile (<i>e.g.</i> tortoise) bones, teeth freshwater units associated with diatoms, molluscs, stromatolites <i>etc</i>	LOW	none recommended any substantial fossil finds to be reported by ECO to SAHRA
Prince Albert Formation ECCA GROUP	Basinal mudrocks with carbonate &phosphatic concretions, minor tuffs EARLY PERMIAN	marine invertebrates (esp. molluscs, brachiopods), coprolites, palaeoniscoid fish & sharks, trace fossils, various microfossils, petrified wood	LOW IN THIS AREA	none recommended any substantial fossil finds to be reported by ECO to SAHRA
Allanridge Formation VENTERSDORP SUPERGROUP	lavas and pyroclastics with minor siliciclastic lenses LATE ARCHAEAN (c. 2.7 Ga)	none	INSENSITIVE	none recommended stromatolites recorded from sediments of underlying Bothaville Formation

Table 4 [.] Summary	v of fossil	heritage in	the	Kimberlev	area
	y or rossii	nemaye m	uie	Rinberrey	area

2.10 Tourism

2.10.1 Tourism Routes

The proposed development falls within the Frances Baard District Municipality (FBDM) which is made up of four local municipalities namely: Dikgatlong Municipality; Magareng Local

Municipality; Phokwane Municipality and Sol Plaatje Municipality. The study site is located in Sol Plaatje Local Municipality.

Tourism in the FBDM is increasingly becoming a major contributor to the global economy (2009 Tourism Strategy for Frances Baard DM). As a destination for tourists, FBDM is the most visited regional destination in the Northern Cape. It is known for its key attractions such as the Kimberley Big Hole, Wildebeest Kuil Rock Art Centre, Galeshewe Activity Route, Kimberley Ghost Trail, McGregor Museum, Hartswater irrigation system and wine cellar and Anglo-Boer War battlefield.

Current visitation to the Northern Cape (i.e. holiday, VFR (Visiting Friends and Relatives) as well as business tourists) is concentrated between Kimberley and Upington. While Kimberley captures 40% of visitors, Upington captures 36% of visitors implying that the FBDM in general and Sol Plaatje Local Municipality in particular are the main beneficiary in tourism in the Province. Other visited areas in FBDM include; the Orange River, the Kalahari Gemsbok National Park, Augrabies Falls and De Aar (FBDM, 2009).

Tourism routes that could potentially be affected by the proposed development include the Anglo Boer War Route, the Diamond Route and the Diamond Birding Route as detailed below.

Anglo Boer War Route

The war between Great Britain and the Boer Republic of Transvaal and the Orange Free State broke out on 11 October 1899 and those living in the Northern Cape region of the Cape Colony were plunged into three years of unimaginable hardship, with accompanying loss of liberty and even life.

The Northern Cape was to play a decisive role in the war, the major battles of the Western Campaign taking place within 120 kilometres of Kimberley. These details are discussed further in the Tourism Assessment Report in Appendix 6G.

By visiting the many battlefields and talking to the local inhabitants, a visitor is able to picture that distant war and bring it to life (Northern Cape Tourism Board, 2007).

The Diamond Route

The Diamond Route was established by the Oppenheimer family in conjunction with De Beers (the international diamond mining company). The Route links eight sites across northern South Africa. It stretches from Namaqualand on the west coast, to Kimberley (Benfontein, Rooipoort and Dronfield), then north to Tswalu in the Kalahari, through Brenthurst Gardens in Johannesburg eastwards to Ezemvelo Nature Reserve and northwards to the Venetia Limpopo reserve in far Limpopo (De Beers 2010).

The route is geared for both ecotourism and general tourism, incorporating new and largely undiscovered natural wonders, as well as historical and cultural elements, including diamond mining. The route caters mainly for independent travellers or small groups. It offers a broad array of activities with expert trained guides, but also allows self-guided tourism at some destinations. Begun as a birding route, the route has a strong element of birding (De Beers 2010).

Although there are several tourism hotspots along the route, only the Kimberley node is highlighted in this report as it located closest to the study area. The Kimberley node encompasses tourism sites namely; Benfontein, Dronfield and Rooipoort. Tourism attractions per site include:

- Benfontein: Camping on historical sites, home of the black wildebeest, night-drives for rare mammals, birding.
- Dronfield: Cottages in Kalahari thornveld, vulture hide, and rare mammal programmes, Anglo-Boer war site.
- Rooipoort: Historical shooting lodge, safari camp, huge area, picturesque Vaal river frontage, petroglyphs.

All these sites are situated near the Big Hole diamond mining museum and world famous Kamfers' Dam flamingo breeding colony (De Beers 2010).

2.10.2 Tourism Trends and Land use

Kimberley is the nearest town that lies along the Diamond Route and the Anglo Boer War Route. The N12 (which is a portion of the diamond route) runs along the eastern side of the study area. In addition, bordering the study site to the east is the unidentified Road heading to Riverton, off the N12. This is also a potential route for tourists.

The Vaal River (where a number of tourism activities (and future development opportunities) exist including the Vaal Aquatic club) is to the north of study area.

The study site is traversed by existing transmission lines of 275kV, 132kV, 66kV and 11kV, as well as a railway line. These infrastructures are well away from the CPV/PV development footprint. The immediate surroundings of the study area are dominated by open areas of natural vegetation. Further north and northwest, the area is characterized by cultivated land. In addition, mining activities which belong to De Beers Consolidated Mines Ltd are mostly to the east of the study area.

The Dronfield Nature Reserve is located south east of the study area.

There is an industrial and commercial area on a small portion of land south west of the site.

Meanwhile residential areas are scattered to the south of the study area.

Tourism Supply

There are a variety of tourism activities around the study area (within a 25km radius), namely:

- The Vaal River to the north of the study area offers a number of tourism activities (and future development opportunities) including the Vaal Aquatic club.
- The vulture feeding site and a restaurant on Dronfield Farm.
- Dronfield Nature Reserve is situated south east of the study area.
- Ingelwood sable breeding establishment, Kamfers dam to the south and the vultures feeding site are major tourism attractions. Ecotourism and general lodges and cottages can be found on this portion.
- Kamfers dam in considered a Natural Heritage site due to its importance to water birds
- Kimberly Golf Club.
- The Big Hole in Kimberly further south is a world heritage site.
- The Diamond Route N12 (Transvaal Road) where a number of attraction spots are situated.
- Further south of the study area is the Kimberley city centre where various eco tourism lodges and Museums (McGregor Museum) are located. Several monuments and statues are found in the Kimberley.
- The Wildebeest Kuil Rock Art Centre south west of the study area.
- There is a heritage site further south west of the study area. This is a potential tourist development destination.
- The current annual events in the district include: Gariep Festival, Kimberley Show, Barney Barnato Golf Week, Flea Market and Jones Street Mall (Tourism Strategy for FBDM 2009).
- Accommodation facilities

The supply of accommodation facilities is concentrated mainly in and around Kimberley which is approximately 15km away from the study site. Tourist accommodation facilities around the study area can be broken up into a number of different categories:

- Bed and breakfasts,
- Guesthouses,
- Hotels/motels/Inns/ lodges,
- Conference facilities,
- Youth hostels/ backpacker
- Caravan and Camping sites
- Chalets

A list of accommodation facilities is included in the Tourism Assessment Report. They are important to the tourism in the area. There are approximately 106 accommodation facilities in

Kimberly. However, only nine facilities within a 2km radius of the study area were interviewed. The total number of beds in the nine facilities is 324 and mostly business tourists are the main guests (Pers. Comm. 2010).

There is generally a significant number of tourism facilities in the wider area which indicates an excellent supply of tourist accommodation and facilities in the area.

Much of this is concentrated the town of Kimberley. Dronfield Nature Reserve immediately south east of the study area offers self-catering accommodation facilities (i.e. chalets sleeping between 2 to 4 guests) as well as conference facilities (accommodating up to 30 guests).

2.11 Socio-economic

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2.11.1 Site Location and Description

The Droogfontein site is located within the Sol Plaatje Local Municipality that forms part of the Frances Baard District of the Northern Cape.

At 362,591.4km² the Northern Cape has the biggest land mass of all the provinces and covers approximately 29.7% of South Africa's total land surface. Apart from its western border that is bounded by the Atlantic Ocean, the province is mostly landlocked: Namibia lies to the north-west, Botswana to the north, and the Western Cape to the south.

The province was home to two cross-boundary municipalities (the Ga-Segonyana District Municipality and the Phokwane Local Municipality) that overlapped with the Northwest Province, but in 2006 these municipalities were incorporated into the Northern Cape. This incorporation led to an increase in the province's total population by approximately 180,000 people and had a significant impact on the province's services backlog in terms of water, sanitation, housing and electricity.

By the year 2007, the total population size of the province was estimated to be around 1.1 million people, which represents a population increase of approximately 66,000 people from 2001 when the last census was conducted. Based on the population size of 2007, the province has an extremely low population density, estimated at around 3 persons per square kilometer. However, it can be expected that the population density will increase in the urban areas, e.g. in the Sol Plaatje Local Municipal area (Kimberley) the population density stands at approximately 129.5 people per square kilometer.

According to the Northern Cape Province Fifteen Year Review (2009), the main economic contributors are mining and agriculture, despite the fact that the mining industry does not absorb as much labour as the agricultural sector. The Northern Cape's contribution to the Gross Domestic Product (GDP) showed an average growth rate of 4.1% per annum during the period

1995 to 2006. The Fifteen Year Review further stipulated that the agricultural sector within the province grew faster than the national average, in part due to the provincial government's policies in terms of the transformation of the agricultural sector.

One of the most significant driving forces behind the transformation of the agricultural sector is the Land Reform Programme as the provincial government adopted the national target of redistributing at least 30% of the productive agricultural land within the province to historically disadvantaged communities by the year 2014. In the Northern Cape alone a total of 2,883 land claims were lodged with the Land Claims Commission, of which a total of 552,084ha have successfully been transferred to the beneficiaries by January 2008.

3 CURRENT STATUS OF THE ENVIRONMENT

3.1 Ecology

Imagery from Google Earth shows that there have been no changes on site over time. The vegetation patterns as originally described (Koch 2012) appear to have remained stable aside from the construction of the solar energy facility on the adjacent site in 2019. The general status and species composition of the site will be confirmed during an upcoming field assessment, but it is not expected that any fundamental changes will be observed. The preliminary conclusion is therefore that the baseline conditions on site have not changed. Available information indicates that the biophysical environment on site is unchanged between the original assessment and the current date, except for the construction of the solar energy facility on the adjacent site.

3.2 Avifauna

The project development area is classified as High sensitivity for avifauna, according to the DFFE online screening tool. The development sites contain confirmed habitat for species of conservation concern (SCC). The occurrence of SCC was confirmed during the original surveys in August 2010 and March 2011, namely White-backed Vulture. Martial Eagle was recorded during the subsequent site visit in October 2022, and it was confirmed that the habitat has not changed for the above listed SCC at the development area. The classification High sensitivity is assessed to be accurate as far as the potential presence of SCC is concerned, based on actual conditions recorded on the ground during the site visits in August 2010 and March 2011, and the subsequent site visit conducted in October 2022.

3.3 Agricultural and Soils

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There has been no significant change to the baseline agricultural environment since the original assessment. The agricultural potential of the study area is still totally limited by climate and soil constraints.

3.4 Visual

A desktop assessment was undertaken using Google Earth Imagery. From this assessment, it was established that although the landscape immediately east of Droogfontein 3 SEF development area, and also to the south-east, has undergone some transformation as a result of the development of Solar PV facilities, there has been little significant change in the baseline characteristics or in the number of sensitive receptors across the remainder of the Droogfontein 3 SEF VIA study area since 2011.

3.5 Geotech

The evaluations of the original Geotech has shown that no additional impacts will arise to those previously assessed.

3.6 Heritage

The evaluations of the original HIA and subsequent documentation has shown that it is envisaged that no changes are envisaged to the project impact.

3.7 Social

The evaluations of the original SIA and subsequent documentation has shown that it is envisaged that no changes are envisaged to the project impact.

4 SITE VERIFICATION AND NEW GUIDELINES/PROTOCOLS

The proposed development does not fall within the Renewable Energy Development Zone (REDZ) or Electrical Grid Infrastructure corridors. Where required, specialists have taken into consideration the Protocol for the specialist assessment and minimum report content requirements for environmental impacts (Government Gazette No 43855, 30 October 2020).

4.1 Ecology

Following current legislation, an assessment of the site would have required compliance with gazetted Species Protocols. A Screening Tool report for the site shows that Terrestrial Biodiversity and Aquatic Biodiversity Themes have low sensitivity. This would be confirmed by an on-site field verification, followed by a Site Sensitivity Verification. Information from the original assessment (Koch 2012) indicates that the low sensitivity for these two themes is confirmed. For the Plant Theme (Medium sensitivity) and Animal Theme (High sensitivity), the sensitivity would need to be confirmed on-site and either a Compliance Statement provided by the specialist, or an Assessment. No plant species of concern were detected by Koch (2012, see checklist on page 15 - 16), therefore a Compliance Statement would have sufficed. For the Animal Theme, two of the **SOUTH AFRICA MAINSTREAM RENEWABLE POWER DROOGFONTEIN PV 3 (PTY) LTD**

three bird species flagged for the site were recorded by Koch (2012), as well as the Giant Bullfrog. An Animal Species Assessment would therefore have been required.

4.2 Avifauna

The project development area is classified as **High** sensitivity for avifauna, according to the DFFE online screening tool. The development sites contain 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, Vulnerable, near threatened or Data Deficient. The classification of High sensitivity is linked to the potential occurrence of Ludwig's Bustard (Globally and Regionally Endangered).

5 TERMS OF REFERENCE FOR SPECIALITS

The specialists were provided with the same terms of references as provided by the DFFE requesting additional information (refer to the specialist's letters).

6 CONFIRMATION OF IMPACT RATING AND MITIGATION MEASURES

The following specialist studies were undertaken in 2012 as per the Plan of Study for EIA:

- Biodiversity Assessment (including fauna, flora and avifauna)
- Surface Water Assessment
- Agricultural Potential and Soils Assessment
- Visual Impact Assessment
- Geotechnical Assessment
- Heritage Impact Assessment
- Socio-economic Assessment

Below is a summary of the findings:

Table 5: Summary of findings and recommendations (2012)

Environmental Parameter		Summary of major findings Recommendations
Biodiversity	Impact	No fatal flaws are present on Strict mitigation measures
Assessment		the site however some must be in place and must be
		potentially sensitive areas are implemented. Monitoring is
		present namely the pans and required
		thornveld areas. These areas
		exhibit sensitivities in terms of

Environmental Parameter	Summary of major findings	Recommendations
	species present (Bullfrogs	
	present, White backed	
	vultures present). Very few if	
	any Camel Thorn trees will be	
	affected by the proposed	
	development. The actual	
	footprint is not an issue. Birds	
	are the faunal grouping which	
	could be affected the worst by	
	the proposed development	
	however suitable mitigation	
	measures can reduce these	
	impacts.	
Surface Water Impact	No surface water features on	No surface water features
Assessment	site	were identified on site and in
		the immediate area of the
		PV/CPV site therefore no
		impacts are expected.
Groundwater Impact	The proposed development	Stringent implementation of
Assessment	has not been identified as a	mitigation measures.
	major risk to groundwater	
	however minor risks	
	associated with hydrocarbons	
	are present which require	
	management.	
Visual Impact Assessment	It was established that the	Mitigation measures
	proposed development will	suggested in the visual study
	have a moderate visual impact	must be implemented to
	on motorists travelling along	reduce potential visual
	the Riverton road. Very Low	impacts.
	visual impacts are expected	
	along N12 highway as well as	
	visitors using the self drive	
	game routes within the	
	Dronfield Nature Reserve. The	
	proposed solar energy facility	
	will have a negative low visual	
	impact during construction and	
	operation, with very few	
	mitigation measures available	

Environmental Parameter	Summary of major findings	Recommendations
Heritage Impact Assessment	No heritage features have	Strict implementation of
	been identified within the	mitigation and management
	proposed PV site. Heritage	measures. Consultation with
	sensitive areas are present in	SAHRA through a heritage
	the surrounding area. Several	specialist for the duration of
	Palaeontology features have	construction.
	been identified in the wider	
	site	
Tourism Impact Assessment	The CPV/ PV is distant from a	Vegetation clearing should be
	major tourist route (N12) and a	minimised and the area
	major tourist destination	rehabilitated as soon as
	(Dronfield Nature Reserve). It	possible to minimise visual
	is anticipated that tourists	impacts along Riverton road.
	travelling along N12 and those	
	within the Nature Reserve will	
	not view the proposed power	
	plant in this area. Therefore	
	the sensitivity of CPV/ PV	
	plant is considered low.	
	However Riverton road which	
	is potentially utilised by	
	tourists travelling to the	
	Riverton Pleasure Resort on	
	the banks of the Vaal River	
	where a number of adventure	
	and water sport activities take	
	place. Visual impacts along	
	Riverton road are considered	
	moderate according to the	
	visual study.	
	On a positive note, the impact	 Creating demand through
	of the proposed development	appropriate marketing of
	on corporate demand for	tourism assets in the area.
	tourism facilities is anticipated	 Improvement of tourism
	to be minimal as the	infrastructure by
	professional team on the	establishing an up to date
	project is expected to be	tourism information office
	small.	so as to increase tourism
		demand.

Environmental Parameter	Summary of major findings	Recommendations
		 Identification and Development of new tourist attractions Creating demand through appropriate marketing of tourism assets in the area. The above recommendations are not be implemented by the proponent but rather by the respective tourism bodies in the study area
Socio-economic Impact Assessment	Some negative social impacts have been identified however these are able to be mitigated. Several positive impacts associated with the proposed development have also been identified such as a corporate social investment plan to address the high levels of poverty and unemployment in the local community. The proposed development is in line with the SDF and provides an opportunity for reviving the tourism environment of Kimberley.	Social issues identified during the EIA phase are addressed during construction. This could be done by engaging social specialists where necessary or by ensuring that ECOs used during construction have the necessary knowledge and skills to identify social problems and address these when necessary. Guidelines on managing possible social changes and impacts could be developed for this purpose. Neighbouring landowners are informed beforehand of any construction activity that is going to take place in close proximity to their property. Prepare them on the number of people that will be on site and on the activities they will engage in. Employees are aware of their responsibility in terms of

Environmental Parameter	Summary of major findings	Recommendations
		Mainstream's relationship with
		landowners and communities
		surrounding the site.
		Implement an awareness drive
		to relevant parts of the
		construction team to focus on
		respect, adequate
		communication and the 'good
		neighbour principle.'
		All mitigation measures in the
		SIA that are relevant to the
		construction phase are
		incorporated in the EMPr to
		ensure that Mainstream and
		the contractor adhered to
		these

7 POTENTIAL FOR CHANGE IN THE SIGNIFICANCE OF IMPACTS AS ASSESSED IN THE EIA AS A RESULT OF THE REQUESTED AMDENDMENT

7.1 Impacts on Ecology

The original assessment (Koch 2012) identified three impacts for the proposed project, as follows:

- Loss of habitat for Red List / general species (Low significance, low after mitigation)
- Edge effect (on biodiversity) (Medium significance, low after mitigation)
- Bird collisions (Low significance, low after mitigation).

Several mitigation measures were proposed in the original assessment (Koch 2012), as follows (with comments in italics and square brackets):

- An on-site ecologist should be present when site excavation takes place to ensure that any uncovered species are protected from destruction. [*Any measures related to plant species should be contained in the appropriate Management Plan, e.g., Plant Rescue Management Plan*].
- Demarcation of sensitive areas prior to construction activities starting.

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- Use of appropriate construction methods in the sensitive area.
- Use of appropriate construction methods in the sensitive areas. [Appropriate construction methods are not defined].
- A copy of the Environmental Impact Report and associated Environmental Management Programme as well as the specialist study must be present at the construction site for easy reference to specialist recommendations in sensitive areas.
- It is recommended that the construction crew be educated about the sensitivities involved in these areas as well as the potential species they could encounter. A poster of sensitive species (compiled by a qualified specialist) should be kept on the construction site for easy reference. [A flora permit is required for any protected plant species expected to be lost to the development the identity of such species and numbers affected must be compiled during a Pre-Construction Walkthrough Survey].
- Rehabilitation to be undertaken as soon as possible after construction in sensitive area has been completed.
- Only vegetation within the study area must be removed. [Assume specialist meant "within the footprint of the construction and infrastructure of the proposed project"].
- Vegetation removal must be phased in order to reduce impact of construction. [*The phasing of vegetation removal within the project footprint area will make no difference to the final outcome*].
- Construction site office and laydown areas must be clearly demarcated, and no encroachment must occur beyond demarcated areas. [In general, project activities should be within the approved footprint area only].
- All natural areas impacted during construction must be rehabilitated with locally indigenous plant species. [Assume this applies to temporary construction impacts. This should be covered in the Rehabilitation/Revegetation Management Plan].
- Construction areas must be well demarcated, and these areas strictly adhered to.
- The use of pesticides and herbicides in the study area must be discouraged as these impacts on important pollinator species of indigenous vegetation
- Soils must be kept free of petrochemical solutions that may be kept on site during construction. Spillage can result in a loss of soil functionality thus limiting the re-establishment of flora. [*It is assumed that there is a legal obligation to adhere to any measures related to dangerous / hazardous chemicals and that these measures are contained in the relevant Management Plan*].
- Six monthly checks of the area should take place for the emergence of invader species. [Management of alien plant species should be detailed in an Alien Invasive Management Plan, which should also include monitoring requirements. Management of alien plant species is a legal requirement, as per NEMBA and CARA. The impact of alien plant species should have been assessed as a potential impact.].
- Mitigation measures mentioned for the construction phase above must be implemented for any maintenance of the development that may be undertaken during the operation phase.
- Correct rehabilitation with locally indigenous species.

- Monitoring programme to ensure that rehabilitation efforts are successful to ensure that risks such as erosion and the edge effect are avoided. [Edge effects are unavoidable where infrastructure is located in previously natural spaces.]
- Constant maintenance of the area to ensure re-colonisation of floral species. [*This should be covered in the Rehabilitation/Revegetation Management Plan*].
- Regular removal of alien species which may jeopardise the proliferation of indigenous species. [Management of alien plant species should be detailed in an Alien Invasive Management Plan].

New proposed mitigation measures

The following mitigation measures are proposed to replace those in the original assessment:

- Ensure that impacts during construction and operation are restricted to the project footprint area and do not spread into surrounding natural areas.
- Compile and implement the following management plans, each of which should include appropriate monitoring guidelines:
 - a. Rehabilitation Management Plan.
 - b. Alien Invasive Management Plan.
 - c. Open Space Management Plan.
 - d. Plant Rescue/Protection Management Plan.
 - e. Black-footed Cat Management Plan (in consultation with EWT).
- Obtain all required protected fauna, protected flora and protected tree permits from the relevant authorities. This will require a detailed pre-construction walk-through survey of the infrastructure footprint area. This is primarily a legal compliance measure and is not necessarily to mitigate any specific impacts.

7.1.1 Conclusion

In conclusion, the proposed amendment of the Environmental Authorisation to extend the commencement period will have no implications for the original assessment. They will not change the potential impacts. The baseline conditions have also not changed; therefore, the original assessment is valid. It is recommended that the amendment to the extension of the commencement period be approved. Revised mitigation measures are proposed to align with current best practice.

7.2 Impacts on Avifauna

Bird distribution data of the South African Bird Atlas 2 (SABAP 2) was obtained from the University of Cape Town (2022), as a means to ascertain which species occur within the broader area i.e., within a block consisting of 8 pentads where the proposed project development area will be located. A pentad grid cell covers 5 minutes of latitude by 5 minutes of longitude (5'× 5'). Each

pentad is approximately 8×7.6 km. From 2007 to date, a total of 68 full protocol lists (i.e., surveys lasting a minimum of two hours each) have been completed for this area. In addition, 36 ad hoc protocol lists (i.e., surveys lasting less than two hours but still yielding valuable data) have been completed. The broader area was selected on the basis of the number of checklists that had been completed, in order to get a more representative view of the avifauna that could occur at the project site.

According to the SABAP2 projects, a total of 261 species occurs in the broader area. The species that were recorded on and around the project development area during the site visit on 5 October 2022 are listed below:

Species name	Scientific name	SABAP 2 Full protocol reporting rate	SABAp2 Ad hoc protocol reporting rate	Global status	Regional status	Recorded during surveys in 2010/2011	Recorded during surveys in 2022
Abdim's Stork	Ciconia abdimii	4.44	1.19	-	NT		
Acacia Pied Barbet	Tricholaema leucomelas	81.11	14.29	-	-	х	
African Black Swift	Apus barbatus	2.22	0.00	-	-		
African Cuckoo	Cuculus gularis	11.11	2.38	-	-		
African Darter	Anhinga rufa	15.56	2.38	-	-		
African Fish Eagle	Haliaeetus vocifer	15.56	2.38	-	-		
African Grey Hornbill	Lophoceros nasutus	1.11	0.00	-	-		
African Hoopoe	Upupa africana	65.56	5.95	-	-		
African Jacana	Actophilornis africanus	4.44	0.00	-	-		
African Marsh Harrier	Circus ranivorus	1.11	0.00	-	EN		
African Palm Swift	Cypsiurus parvus	43.33	7.14	-	-		
African Paradise Flycatcher	Terpsiphone viridis	1.11	0.00	-	-		
African Pipit	Anthus cinnamomeus	43.33	9.52	-	-		х
African Red-eyed Bulbul	Pycnonotus nigricans	78.89	10.71	-	-		
African Reed Warbler	Acrocephalus baeticatus	12.22	1.19	-	-		
African Sacred Ibis	Threskiornis aethiopicus	13.33	3.57	-	-		
African Snipe	Gallinago nigripennis	1.11	0.00	-	-		
African Spoonbill	Platalea alba	2.22	0.00	-	-		
African Stonechat	Saxicola torquatus	6.67	1.19	-	-		
African Swamphen	Porphyrio madagascariensis	1.11	0.00	-	-		
Alpine Swift	Tachymarptis melba	22.22	3.57	-	-		
Amur Falcon	Falco amurensis	14.44	0.00	-	-		
Ant-eating Chat	Myrmecocichla formicivora	74.44	19.05	-	-	х	х
Ashy Tit	Melaniparus cinerascens	66.67	7.14	-	-		
Banded Martin	Riparia cincta	13.33	0.00	-	-		
Barn Swallow	Hirundo rustica	52.22	10.71	-	-		

Table 6: Avifauna recorded by SABAP 2 and during surveys in the broader area in March2012 and at the Droogfontein development area in October 2022. Species of conservationconcern (SCC) are shaded in green

SOUTH AFRICA MAINSTREAM RENEWABLE POWER DROOGFONTEIN PV 3 (PTY) LTD

prepared by: SiVEST Environmental

Amendment Application Revision No. 2 18 October 2022

Species name	Scientific name	SABAP 2 Full protocol reporting rate	SABAp2 Ad hoc protocol reporting rate	Global status	Regional status	Recorded during surveys in 2010/2011	Recorded during surveys in 2022
Barred Wren-Warbler	Calamonastes fasciolatus	2.22	0.00	-	-		
Black Crake	Zapornia flavirostra	6.67	0.00	-	-		
Black Cuckoo	Cuculus clamosus	10.00	0.00	-	-		
Black-chested Prinia	Prinia flavicans	84.44	9.52	-	-		
Black-chested Snake Eagle	Circaetus pectoralis	6.67	0.00	-	-		
Black-crowned Night Heron	Nycticorax nycticorax	0.00	1.19	-	-		
Black-faced Waxbill	Brunhilda erythronotos	15.56	1.19	-	-		
Black-headed Heron	Ardea melanocephala	3.33	1.19	-	-		
Black-necked Grebe	Podiceps nigricollis	10.00	0.00	-	-		
Blacksmith Lapwing	Vanellus armatus	41.11	4.76	-	-		
Black-throated Canary	Crithagra atrogularis	47.78	3.57	-	-		
Black-winged Kite	Elanus caeruleus	55.56	10.71	-	-		
Black-winged Stilt	Himantopus himantopus	10.00	4.76	-	-		
Blue Waxbill	Uraeginthus angolensis	2.22	1.19	-	-		
Blue-billed Teal	Spatula hottentota	0.00	1.19	-	-		
Bokmakierie	Telophorus zeylonus	23.33	0.00	-	-		
Booted Eagle	Hieraaetus pennatus	2.22	0.00	-	-		
Bradfield's Swift	Apus bradfieldi	15.56	2.38	-	-		
Brown Snake Eagle	Circaetus cinereus	1.11	0.00	-	-		
Brown-backed Honeybird	Prodotiscus regulus	1.11	0.00	-	-		
Brown-crowned Tchagra	Tchagra australis	42.22	4.76	-	-		
Brown-hooded Kingfisher	Halcyon albiventris	11.11	1.19	-	-		
Brown-throated Martin	Riparia paludicola	20.00	2.38	-	-		
Brubru	Nilaus afer	71.11	11.90	-	-		
Buffy Pipit	Anthus vaalensis	21.11	1.19	-	-		
Burchell's Coucal	Centropus burchellii	4.44	0.00	-	-		
Burchell's Sandgrouse	Pterocles burchelli	13.33	1.19	-	-		
Cape Bunting	Emberiza capensis	2.22	0.00	-	-		
Cape Eagle-Owl	Bubo capensis	1.11	0.00	-	-		
Cape Penduline Tit	Anthoscopus minutus	14.44	0.00	-	-		
Cape Robin-Chat	Cossypha caffra	17.78	0.00	-	-		
Cape Shoveler	Spatula smithii	15.56	1.19	-	-		
Cape Sparrow	Passer melanurus	47.78	2.38	-	-		
Cape Starling	Lamprotornis nitens	80.00	20.24	-	-		
Cape Teal	Anas capensis	15.56	1.19	-	-		
Cape Turtle Dove	Streptopelia capicola	91.11	16.67	-	-	х	
Cape Vulture	Gyps coprotheres	10.00	9.52	VU	EN		
Cape Wagtail	Motacilla capensis	34.44	3.57	-	-		
Capped Wheatear	Oenanthe pileata	8.89	0.00	-	-		
Cardinal Woodpecker	Dendropicos fuscescens	28.89	2.38	-	-		
Caspian Tern	Hydroprogne caspia	2.22	0.00	-	VU		
Chat Flycatcher	Melaenornis infuscatus	6.67	1.19	-	-		

Species name	Scientific name	SABAP 2 Full protocol reporting rate	SABAp2 Ad hoc protocol reporting rate	Global status	Regional status	Recorded during surveys in 2010/2011	Recorded during surveys in 2022
Chestnut-banded Plover	Charadrius pallidus	5.56	2.38	-	NT		
Chestnut-vented Warbler	Curruca subcoerulea	91.11	16.67	-	-	х	
Cinnamon-breasted Bunting	Emberiza tahapisi	12.22	0.00	-	-		
Cloud Cisticola	Cisticola textrix	13.33	1.19	-	-		
Common Buzzard	Buteo buteo	23.33	7.14	-	-		
Common Greenshank	Tringa nebularia	3.33	0.00	-	-		
Common House Martin	Delichon urbicum	1.11	0.00	-	-		
Common Moorhen	Gallinula chloropus	23.33	2.38	-	-		
Common Myna	Acridotheres tristis	15.56	2.38	-	-		
Common Ostrich	Struthio camelus	47.78	4.76	-	-		
Common Quail	Coturnix coturnix	3.33	0.00	-	-		
Common Ringed Plover	Charadrius hiaticula	3.33	0.00	-	-		
Common Scimitarbill	Rhinopomastus cyanomelas	68.89	13.10	-	-		
Common Starling	Sturnus vulgaris	4.44	0.00	-	-		
Common Swift	Apus apus	7.78	0.00	-	-		
Common Waxbill	Estrilda astrild	6.67	1.19	-	-		х
Crested Barbet	Trachyphonus vaillantii	31.11	0.00	-	-		
Crimson-breasted Shrike	Laniarius atrococcineus	51.11	2.38	-	-		
Crowned Lapwing	Vanellus coronatus	71.11	10.71	-	-		х
Desert Cisticola	Cisticola aridulus	63.33	5.95	-	-		
Diederik Cuckoo	Chrysococcyx caprius	38.89	3.57	-	-		
Double-banded Courser	Rhinoptilus africanus	6.67	0.00	-	-		х
Dusky Sunbird	Cinnyris fuscus	6.67	0.00	-	-		х
Eastern Clapper Lark	Mirafra fasciolata	60.00	8.33	-	-		
Egyptian Goose	Alopochen aegyptiaca	42.22	7.14	-	-		
Eurasian Hobby	Falco subbuteo	1.11	0.00	-	-		
European Bee-eater	Merops apiaster	54.44	8.33	-	-		
European Roller	Coracias garrulus	5.56	0.00	-	NT		
Fairy Flycatcher	Stenostira scita	10.00	0.00	-	-	х	х
Familiar Chat	Oenanthe familiaris	62.22	8.33	-	-		
Fawn-colored Lark	Calendulauda africanoides	55.56	7.14	-	-	х	
Fiscal Flycatcher	Melaenornis silens	84.44	14.29	-	-		
Fork-tailed Drongo	Dicrurus adsimilis	75.56	0.00	-	-	х	
Gabar Goshawk	Micronisus gabar	13.33	2.38	-	-		
Giant Kingfisher	Megaceryle maxima	4.44	1.19	-	-		
Glossy Ibis	Plegadis falcinellus	14.44	2.38	-	-		
Golden-breasted Bunting	Emberiza flaviventris	32.22	1.19	-	-		
Golden-tailed Woodpecker	Campethera abingoni	37.78	3.57	-	-		
Goliath Heron	Ardea goliath	0.00	1.19	-	-		
Great Crested Grebe	Podiceps cristatus	1.11	0.00	-	-		
Great Egret	Ardea alba	1.11	0.00	-	-		
Great Reed Warbler	Acrocephalus arundinaceus	2.22	0.00	-	-		

Species name	Scientific name	SABAP 2 Full protocol reporting rate	SABAp2 Ad hoc protocol reporting rate	Global status	Regional status	Recorded during surveys in 2010/2011	Recorded during surveys in 2022
Greater Flamingo	Phoenicopterus roseus	24.44	10.71	-	NT		
Greater Honeyguide	Indicator indicator	3.33	0.00	-	-		
Greater Kestrel	Falco rupicoloides	17.78	0.00	-	-		
Greater Striped Swallow	Cecropis cucullata	48.89	8.33	-	-		
Green Wood Hoopoe	Phoeniculus purpureus	5.56	1.19	-	-		
Green-winged Pytilia	Pytilia melba	11.11	0.00	-	-		
Grey Go-away-bird	Crinifer concolor	1.11	0.00	-	-		
Grey Heron	Ardea cinerea	3.33	1.19	-	-		
Grey-backed Cisticola	Cisticola subruficapilla	2.22	0.00	-	-		
Grey-backed Sparrow-Lark	Eremopterix verticalis	3.33	0.00	-	-		
Grey-headed Gull	Chroicocephalus cirrocephalus	21.11	7.14	-	-		
Groundscraper Thrush	Turdus litsitsirupa	5.56	0.00	-	-		
Hadada Ibis	Bostrychia hagedash	52.22	8.33	-	-		
Hamerkop	Scopus umbretta	4.44	1.19	-	-		
Helmeted Guineafowl	Numida meleagris	65.56	13.10	-	-		х
House Sparrow	Passer domesticus	22.22	2.38	-	-		
Icterine Warbler	Hippolais icterina	2.22	0.00	-	-		
Intermediate Egret	Ardea intermedia	2.22	0.00	-	-		
Jacobin Cuckoo	Clamator jacobinus	18.89	2.38	-	-		
Kalahari Scrub Robin	Cercotrichas paena	90.00	11.90	-	-	х	
Karoo Scrub Robin	Cercotrichas coryphoeus	8.89	2.38	-	-		
Karoo Thrush	Turdus smithi	17.78	2.38	-	-		
Kittlitz's Plover	Charadrius pecuarius	5.56	1.19	-	-		
Klaas's Cuckoo	Chrysococcyx klaas	2.22	0.00	-	-		
Kori Bustard	Ardeotis kori	5.56	1.19	NT	NT		
Lanner Falcon	Falco biarmicus	4.44	0.00	-	VU		
Lappet-faced Vulture	Torgos tracheliotos	16.67	2.38	EN	EN		
Lark-like Bunting	Emberiza impetuani	11.11	0.00	-	-		
Laughing Dove	Spilopelia senegalensis	72.22	22.62	-	-		
Layard's Warbler	Curruca layardi	1.11	0.00	-	-		
Lesser Flamingo	Phoeniconaias minor	35.56	16.67	NT	NT		
Lesser Grey Shrike	Lanius minor	42.22	5.95	-	-		
Lesser Honeyguide	Indicator minor	2.22	0.00	-	-		
Lesser Kestrel	Falco naumanni	24.44	5.95	-	-		
Lesser Swamp Warbler	Acrocephalus gracilirostris	24.44	2.38	-	-		
Levaillant's Cisticola	Cisticola tinniens	20.00	1.19	-	-		
Lilac-breasted Roller	Coracias caudatus	5.56	0.00	-	-		
Little Bee-eater	Merops pusillus	1.11	0.00	-	-		
Little Egret	Egretta garzetta	2.22	2.38	-	-		
Little Grebe	Tachybaptus ruficollis	21.11	1.19	-	-		
Little Stint	Calidris minuta	4.44	1.19	-	-		
Little Swift	Apus affinis	46.67	8.33	-	-		х

Species name	Scientific name	SABAP 2 Full protocol reporting rate	SABAp2 Ad hoc protocol reporting rate	Global status	Regional status	Recorded during surveys in 2010/2011	Recorded during surveys in 2022
Long-billed Crombec	Sylvietta rufescens	36.67	2.38	-	-		
Ludwig's Bustard	Neotis ludwigii	2.22	0.00	EN	EN		
Maccoa Duck	Oxyura maccoa	4.44	0.00	EN	NT		
Magpie Shrike	Urolestes melanoleucus	2.22	0.00	-	-		
Malachite Kingfisher	Corythornis cristatus	11.11	3.57	-	-		
Marico Flycatcher	Melaenornis mariquensis	38.89	3.57	-	-		
Martial Eagle	Polemaetus bellicosus	6.67	1.19	EN	EN		х
Monotonous Lark	Mirafra passerina	4.44	1.19	-	-		
Montagu's Harrier	Circus pygargus	1.11	0.00	-	-		
Mountain Wheatear	Myrmecocichla monticola	2.22	0.00	-	-		
Namaqua Dove	Oena capensis	51.11	7.14	-	-		
Namaqua Sandgrouse	Pterocles namaqua	11.11	1.19	-	-		
Natal Spurfowl	Pternistis natalensis	2.22	0.00	-	-		
Neddicky	Cisticola fulvicapilla	72.22	5.95	-	-	х	
Nicholson's Pipit	Anthus nicholsoni	5.56	0.00	-	-		
Northern Black Korhaan	Afrotis afraoides	75.56	20.24	-	-	х	х
Orange River Francolin	Scleroptila gutturalis	26.67	3.57	-	-		
Orange River White-eye	Zosterops pallidus	18.89	1.19	-	-		
Pale Chanting Goshawk	Melierax canorus	38.89	5.95	-	-		
Pearl-breasted Swallow	Hirundo dimidiata	4.44	2.38	-	-		
Pearl-spotted Owlet	Glaucidium perlatum	5.56	0.00	-	-		
Pied Avocet	Recurvirostra avosetta	3.33	1.19	-	-		
Pied Crow	Corvus albus	53.33	20.24	-	-	х	х
Pied Kingfisher	Ceryle rudis	13.33	3.57	-	-		
Pied Starling	Lamprotornis bicolor	16.67	7.14	-	-		
Pink-billed Lark	Spizocorys conirostris	2.22	0.00	-	-		
Pin-tailed Whydah	Vidua macroura	7.78	0.00	-	-		
Plain-backed Pipit	Anthus leucophrys	22.22	3.57	-	-		
Pririt Batis	Batis pririt	66.67	9.52	-	-		х
Quailfinch	Ortygospiza atricollis	22.22	0.00	-	-		
Rattling Cisticola	Cisticola chiniana	1.11	0.00	-	-		
Red-backed Shrike	Lanius collurio	24.44	1.19	-	-		
Red-billed Firefinch	Lagonosticta senegala	4.44	0.00	-	-		
Red-billed Quelea	Quelea quelea	34.44	2.38	-	-		
Red-billed Teal	Anas erythrorhyncha	10.00	1.19	-	-		
Red-breasted Swallow	Cecropis semirufa	16.67	1.19	-	-		
Red-capped Lark	Calandrella cinerea	3.33	1.19	-	-		
Red-crested Korhaan	Lophotis ruficrista	41.11	7.14	-	-	х	
Red-eyed Dove	Streptopelia semitorquata	25.56	7.14	-	-		
Red-faced Mousebird	Urocolius indicus	55.56	5.95	-	-		
Red-headed Finch	Amadina erythrocephala	28.89	0.00	-	-		
Red-knobbed Coot	Fulica cristata	16.67	3.57	-	-		

Read Cormorant Microcarbo africanus 14.44 4.76 - Rock Dove Columba livia 6.67 0.00 - - Rock Kestrel Falco rupicolus 4.44 1.19 - - Rock Kestrel Pstaco rupicolus 4.44 0.00 - x x Rose-ringed Parakeet Pstacual k-rameri 0.00 1.19 - - - Rufous-careed Warbler Mairous pactoralis 3.33 0.00 - - - Rufous-acred Warbler Mairous pactoralis 3.33 0.00 - - - Sabota Lark Calendulauda sabota 27.78 2.38 - - x Scaly-feathered Weaver Sporopipes squamifrons 65.56 11.90 - - - - Sociable Weaver Sporopipes squamifrons 65.56 3.57 - - - - - - - - - - - - - -	Species name	Scientific name	SABAP 2 Full protocol reporting rate	SABAp2 Ad hoc protocol reporting rate	Global status	Regional status	Recorded during surveys in 2010/2011	Recorded during surveys in 2022
Bock Dove Columba livia 6.67 0.00 - - Rock Kestrel Falco rupicolus 4.44 1.19 - - - Rock Martin Ptytonorgone fulgula 25.56 2.38 - - x x Ruff Calidris pugnax 4.44 0.00 - - - Rufous-cheeked Nightjar Capinnulgus rufigena 18.69 3.57 - - Rufous-cheeked Nightjar Capinnulgus rufigena 18.69 3.57 - - Rufous-cheeked Nightjar Capinnulgus rufigena 18.69 3.57 - - Rufous-aped Lark Marain arbicana 60.00 10.71 - - - Sadotta Lark Calandendurade sabota 27.78 2.38 - - x Sadarf-Bathered Weaver Sportojopes squamifrons 65.56 11.90 - - - Sociable Weaver Philetairus socius 13.33 0.00 - - - <	Reed Cormorant	Microcarbo africanus	14.44	4.76	-	-		
Rock Kestrel Falco rupicolus 4.44 1.19 - Rock Martin Ptyonoprogne fulligula 25.56 2.38 - x Rode Martin Calidris pugnax 4.44 0.00 - - Ruft Calidris pugnax 4.44 0.00 - - Rufous-cheeked Nightjar Caprimulgus rufigena 18.89 3.57 - - Rufous-aread Warbler Malcorus pectoralis 3.33 0.00 - - - Rufous-aread Warbler Malcorus pectoralis 3.33 0.00 - - - Sabota Lark Calendulauda sabota 27.78 2.38 - x - Sand Martin Riparia riparia 1.11 0.00 - - - - Scaly-feathered Weaver Sportopipes squamitrons 65.66 11.90 - - - - - - - - - - - - - - - - <t< td=""><td>Rock Dove</td><td>Columba livia</td><td>6.67</td><td>0.00</td><td>-</td><td>-</td><td></td><td></td></t<>	Rock Dove	Columba livia	6.67	0.00	-	-		
Rock Martin Ptytonoprogne fuligula 25.56 2.38 - - x x Rose-ringed Parakeet Psittacula krameri 0.00 1.19 - - - Ruff Calidris pugnax 4.44 0.00 - - - Rufous-checked Nightjar Caprimulgus rufigena 18.89 3.57 - - Rufous-checked Nightjar Capinnulgus rufigena 18.89 3.57 - - Sadota Lark Calendulauda sabota 27.78 2.38 - x Sand Martin Riparia riparia 1.11 0.00 - - - Sadat Lark Calendulauda sabota 27.78 2.38 - - x Sadat Martin Riparia riparia 1.11 0.00 - - - - X Secretarybird Sagittarius serpentarius 14.44 1.90 - - X Souther Nealer Philetairus socius 13.33 0.00 -	Rock Kestrel	Falco rupicolus	4.44	1.19	-	-		
Rose-ringed Parakeet Peittacula krameri 0.00 1.19 - Ruff Calidris pugnax 4.44 0.00 - - Rufous-cheeked Nightjar Caprimulgus rufgena 18.89 3.57 - - Rufous-naped Lark Malcorus pectoralis 3.33 0.00 - - Rufous-naped Lark Calendulauda sabota 27.76 2.38 - x Sabota Lark Calidris us sepentarius 1.11 0.00 - - x Sabota Lark Calidrairus sepentarius 14.44 1.19 EN VU - Scaly-feathered Weaver Sporopipes squarifrons 65.56 11.90 -	Rock Martin	Ptyonoprogne fuligula	25.56	2.38	-	-	х	х
Ruff Calidris pugnax 4.44 0.00 - - Rufous-cheeked Nightjar Caprimulgus rufigena 18.89 3.57 - - Rufous-cared Warbler Matorus pectoralis 3.33 0.00 - - Sabota Lark Calendulauda sabota 27.78 2.38 - - x Sand Martin Riparia riparia 1.11 0.00 - - x Scaly-feathered Weaver Sporopipes squamifrons 65.56 11.90 - x Secretarybird Sagittarius serpentarius 14.44 1.19 EN VU - Sociable Weaver Sporopipes squamifrons 65.56 11.90 - - - South African Cliff Swallow Petrochelidon spilodera 25.56 3.57 - - - Southern Fiscal Lanius collaris 57.78 3.57 - - - Southern Red Bishop Euplectes orix 40.00 8.33 - - x <	Rose-ringed Parakeet	Psittacula krameri	0.00	1.19	-	-		
Rufous-cheeked Nightjar Caprimulgus rufigena 18.89 3.57 . . Rufous-apaed Lark Miafara africana 60.00 . . . Sabota Lark Calendulauda sabota 27.78 2.38 . . x Sand Martin Riparia riparia 1.11 0.00 . . . Scaly-feathered Weaver Sporopipes squamifrons 65.56 11.90 . x Secretarybird Sagittarius serpentarius 14.44 1.19 EN VU . Short-toed Rock Thrush Monticola brevipes 7.78 0.00 . . South African Shelduck Tadoma cana 26.67 3.57 . . Southern Fiscal Lanius collaris 57.78 3.57 . . . Southern Masked Weaver Ploceus velatus 71.11 11.90 . . Southern Fiscal Lanius collaris 57.78 3.57 . . X Southern Pachard	Ruff	Calidris pugnax	4.44	0.00	-	-		
Rufous-eared Warbler Malcorus pectoralis 3.33 0.00 - Rufous-naped Lark Mirafra africana 60.00 10.71 - - Sabota Lark Calendulauda sabota 27.78 2.38 - x Sand Martin Riparia riparia 1.11 0.00 - - x Scaly-feathered Weaver Sporopipes squamifrons 65.56 11.90 - x Secretarybird Sagittarius serpentarius 14.44 1.19 EN VU Short-toed Rock Thrush Monticola brevipes 7.78 0.00 - - South African Cliff Swallow Petrochelidon spilodera 25.56 3.57 - - Southerm Fiscal Lanius collaris 57.78 3.57 - x Southerm Red Bishop Euplectes orix 40.00 8.33 - x Southerm Red Sishop Euplectes orix 40.00 - - x Southerm Petion-billed Hornbill Cockus leucormelas 13.33 0.00	Rufous-cheeked Nightjar	Caprimulgus rufigena	18.89	3.57	-	-		
Rufous-naped Lark Mirafra africana 60.00 10.71 - - Sabota Lark Calendulauda sabota 27.78 2.38 - - x Sand Martin Riparia riparia 1.11 0.00 - - x Scaly-feathered Weaver Sporopipes squamifrons 65.56 11.90 - - x Secretarybird Sagittarius serpentarius 14.44 1.19 EN VU - Shaft-tailed Whydah Vidua regia 4.44 0.00 - - - Shaft-tailed Whydah Monticola brevipes 7.78 0.00 - - - South African Shelduck Tadorna cana 26.67 3.57 -	Rufous-eared Warbler	Malcorus pectoralis	3.33	0.00	-	-		
Sabota Lark Calendulauda sabota 27.78 2.38 - - x Sand Martin Riparia riparia 1.11 0.00 - - - Scaly-feathered Weaver Sporopipes squamifrons 65.56 11.90 - - x Secretarybird Sagittarius serpentarius 14.44 1.19 EN VU -<	Rufous-naped Lark	Mirafra africana	60.00	10.71	-	-		
Sand Martin Riparia riparia 1.11 0.00 - - × Scaly-feathered Weaver Sporopipes squamifrons 65.56 11.90 - - × Secretarybird Sagittarius serpentarius 14.44 1.19 EN VU × Shaft-tailed Whydah Vidua regia 4.44 0.00 - - × Short-toed Rock Thrush Monticola brevipes 7.78 0.00 - - - South African Shelduck Tadorna cana 26.67 3.57 - - × Southem Fiscal Lanius collaris 57.78 3.57 - × - Southem Masked Weaver Ploceus velatus 71.11 1.90 - - - Southem Red Bishop Euplectes orix 40.00 8.33 - × - Southem Red Bishop Euplectes orix 40.00 - - - - Speckled Mousebird Colus striatus 1.11 0.00 - <td>Sabota Lark</td> <td>Calendulauda sabota</td> <td>27.78</td> <td>2.38</td> <td>-</td> <td>-</td> <td>х</td> <td></td>	Sabota Lark	Calendulauda sabota	27.78	2.38	-	-	х	
Scaly-feathered Weaver Sporopipes squamifrons 65.56 11.90 - × Secretarybird Sagitarius serpentarius 14.44 1.19 EN VU Shaft-tailed Whydah Vidua regia 4.44 0.00 - - Short-toed Rock Thrush Monitoola brevipes 7.78 0.00 - - South African Shelduck Tadorna cana 26.67 3.57 - - South African Shelduck Tadorna cana 26.67 3.57 - - × Southern Grey-headed Sparrow Passer diffusus 48.89 3.57 - - × Southern Pochard Netta erythrophthalma 7.78 1.19 - - - Southern White-faced Scops Euplectes orix 40.00 8.33 - × - Southern White-faced Scops Filiopsis granti 3.33 0.00 - - - Southern Vellow-billed Hornbill Tockus leucomelas 13.33 2.38 - - -<	Sand Martin	Riparia riparia	1.11	0.00	-	-		
Secretarybird Sagittarius serpentarius 14.44 1.19 EN VU Shaft-tailed Whydah Vidua regia 4.44 0.00 - - Short-toed Rock Thrush Monticola brevipes 7.78 0.00 - - Sociable Weaver Philetairus socius 13.33 0.00 - - South African Shelduck Tadorna cana 26.67 3.57 - - Southern Fiscal Lanius collaris 57.78 3.57 - - x Southern Grey-headed Sparrow Passer diffusus 48.89 3.57 - - x Southern Masked Weaver Ploceus velatus 71.11 11.90 - - - Southern White-faced Scops - - x Southern White-faced Scops - - x Owl Ptilopsis granti 3.33 0.00 - - - - Southern White-faced Scops - - - - - x <t< td=""><td>Scaly-feathered Weaver</td><td>Sporopipes squamifrons</td><td>65.56</td><td>11.90</td><td>-</td><td>-</td><td></td><td>х</td></t<>	Scaly-feathered Weaver	Sporopipes squamifrons	65.56	11.90	-	-		х
Shaft-tailed Whydah Vidua regia 4.44 0.00 - - Shaft-tailed Whydah Monticola brevipes 7.78 0.00 - - Sociable Weaver Philetairus socius 13.33 0.00 - - South African Cliff Swallow Petrochelidon spilodera 25.56 3.57 - - South African Shelduck Tadorna cana 26.67 3.57 - - X Southern Srey-headed Sparrow Passer diffusus 48.89 3.57 - - X Southern Pochard Netta erythrophthalma 7.78 1.19 - - - Southern White-faced Scops Euplectes orix 40.00 8.33 - - x Southern Yellow-billed Hornbill Tockus leucomelas 13.33 2.38 - - - Speckled Pigeon Colius striatus 1.11 0.00 - - x x Spotted Eagle-Owl Bubo africanus 7.78 0.00 - -<	Secretarybird	Sagittarius serpentarius	14.44	1.19	EN	VU		
Short-toed Rock Thrush Monticola brevipes 7.78 0.00 - - Sociable Weaver Philetairus socius 13.33 0.00 - - South African Cliff Swallow Petrochelidon spilodera 25.56 3.57 - - South African Shelduck Tadorra cana 26.67 3.57 - × Southern Fiscal Lanius collaris 57.78 3.57 - × Southern Grey-headed Sparrow Passer diffusus 48.89 3.57 - × Southern Red Bishop Euplectes velatus 71.11 11.90 - - Southern White-faced Scops 0.00 8.33 - × - Owl Ptilopsis granti 3.33 0.00 - - Speckled Mousebird Colius striatus 1.11 0.00 - - Speckled Pigeon Coliuba guinea 58.89 4.76 - × x Spotted Eagle-Owl Bubo africanus 7.78 0.00 - <td>Shaft-tailed Whydah</td> <td>Vidua regia</td> <td>4.44</td> <td>0.00</td> <td>-</td> <td>-</td> <td></td> <td></td>	Shaft-tailed Whydah	Vidua regia	4.44	0.00	-	-		
Sociable Weaver Philetairus socius 13.33 0.00 - - South African Cliff Swallow Petrochelidon spilodera 25.56 3.57 - - South African Shelduck Tadoma cana 26.67 3.57 - - Southem Fiscal Lanius collaris 57.78 3.57 - - Southem Grey-headed Sparrow Passer diffusus 48.89 3.57 - - Southern Masked Weaver Ploceus velatus 71.11 11.90 - - Southern Pochard Netta erythrophthalma 7.78 1.19 - - Southern White-faced Scops 000 8.33 - x S Owl Ptilopsis granti 3.33 0.00 - - Speckled Pigeon Columba guinea 58.89 4.76 - x Spotted Eagle-Owl Bubo africanus 7.78 0.00 - - Spotted Flycatcher Muscicapa striata 32.22 0.00 - -	Short-toed Rock Thrush	Monticola brevipes	7.78	0.00	-	-		
South African Cliff Swallow Petrochelidon spilodera 25.56 3.57 - - South African Shelduck Tadorna cana 26.67 3.57 - - x Southern Fiscal Lanius collaris 57.78 3.57 - - x Southern Masked Weaver Ploceus velatus 71.11 11.90 - - Southern Pochard Netta erythrophthalma 7.78 1.19 - - Southern Red Bishop Euplectes orix 40.00 8.33 - x Southern White-faced Scops Owl Ptilopsis granti 3.33 0.00 - - Southern Yellow-billed Hornbill Tockus leucomelas 13.33 2.38 - - x Speckled Mousebird Collus striatus 1.11 0.00 - - - - - - - x Speckled Mousebird Columba guinea 58.89 4.76 - - x Spite-heeled Lark Chersormanes albofasciata 32.22	Sociable Weaver	Philetairus socius		0.00	-	-		
South African Shelduck Tadorna cana 26.67 3.57 - - Southern Fiscal Lanius collaris 57.78 3.57 - × Southern Grey-headed Sparrow Passer diffusus 48.89 3.57 - × Southern Grey-headed Sparrow Passer diffusus 48.89 3.57 - × Southern Masked Weaver Ploceus velatus 71.11 11.90 - Southern Pochard Netta erythrophthalma 7.78 1.19 - Southern White-faced Scops 00 8.33 - × Owl Ptilopsis granti 3.33 0.00 - Southern Yellow-billed Hornbill Tockus leucomelas 13.33 2.38 - Speckled Pigeon Columba guinea 58.89 4.76 - × x Spitke-heeled Lark Chersomanes albofasciata 31.11 3.57 - × x Spotted Flycatcher Muscicapa striata 32.22	South African Cliff Swallow	Petrochelidon spilodera	25.56	3.57	-	-		
Southern FiscalLanius collaris57.783.57xSouthern Grey-headed SparrowPasser diffusus48.893.57Southern Masked WeaverPloceus velatus71.1111.90Southern PochardNetta erythrophthalma7.781.19Southern Red BishopEuplectes orix40.008.33-xxSouthern White-faced ScopsPtilopsis granti3.330.00Southern Yellow-billed HornbillTockus leucomelas13.332.38Speckled MousebirdColius striatus1.110.00xSpeckled PigeonColumba guinea58.894.76-xxSpotted Eagle-OwlBubo africanus7.780.00Spotted Eagle-OwlBubo africanus7.780.00Spotted Thick-kneeBurhinus capensis22.223.57Spur-winged GoosePlectropterus gambensis15.561.19Striated HeronButorides striata10.003.57Swallow-tailed Bee-eaterMerops hirundineus42.228.33Swallow-tailed Bee-eaterMerops hirundineus42.228.33Tawny EagleAquila rapax4.440.00 <td>South African Shelduck</td> <td>Tadorna cana</td> <td>26.67</td> <td>3.57</td> <td>-</td> <td>-</td> <td></td> <td></td>	South African Shelduck	Tadorna cana	26.67	3.57	-	-		
Southern Grey-headed SparrowPasser diffusus48.893.57Southern Masked WeaverPloceus velatus71.1111.90Southern PochardNetta erythrophthalma7.781.19Southern Red BishopEuplectes orix40.008.33-xSouthern White-faced Scops0OwlPtilopsis granti3.330.00Southern Yellow-billed HornbillTockus leucomelas13.332.38-Speckled MousebirdColius striatus1.110.00Speckled PigeonColumba guinea58.894.76-xSpike-heeled LarkChersomanes albofasciata31.113.57-xSpotted FlycatcherMuscicapa striata32.220.00Spotted Thick-kneeBurhinus capensis22.223.57Spur-winged GoosePlectropterus gambensis15.561.19Striated HeronButorides striata10.003.57Striated HeronButorides striata10.003.57Swallow-tailed Bee-eaterMerops hirundineus42.228.33Tawny EagleAquila rapax4.440.00Terminck's CourserCursorius termininckii4.440.00Three-banded PloverCharadrius tricollaris12.222.38- <td< td=""><td>Southern Fiscal</td><td>Lanius collaris</td><td>57.78</td><td>3.57</td><td>-</td><td>-</td><td>х</td><td></td></td<>	Southern Fiscal	Lanius collaris	57.78	3.57	-	-	х	
Southern Masked WeaverPloceus velatus71.1111.90-Southern PochardNetta erythrophthalma7.781.19Southern Red BishopEuplectes orix40.008.33xSouthern White-faced ScopsPtilopsis granti3.330.00Southern Yellow-billed HornbillTockus leucomelas13.332.38Speckled MousebirdColius striatus1.110.00Speckled PigeonColumba guinea58.894.76xSpite-heeled LarkChersomanes albofasciata31.113.57xSpotted Eagle-OwlBubo africanus7.780.00Spotted FlycatcherMuscicapa striata32.220.00Spotted Thick-kneeBurhinus capensis12.223.57Sputed HoronButoides striata10.003.57Strak's LarkSpizocorys starki1.110.00Striated HeronButorides striata10.003.57Swainson's SpurfowlPternistis swainsonii23.333.57Swainson's SpurfowlPternistis swainsonii23.333.57Striated HeronButorides striata10.00 <tr< tr="">Swainson's SpurfowlPte</tr<>	Southern Grev-headed Sparrow	Passer diffusus	48.89	3.57	-	-		
Southern PochardNetta erythrophthalma7.781.19Southern Red BishopEuplectes orix40.008.33xSouthern White-faced ScopsPtilopsis granti3.330.00Southern Yellow-billed HornbillTockus leucomelas13.332.38Speckled MousebirdColius striatus1.110.00Speckled PigeonColumba guinea58.894.76xSpike-heeled LarkChersomanes albofasciata31.113.57xSpotted Eagle-OwlBubo africanus7.780.00Spotted FlycatcherMuscicapa striata32.220.00Spotted Thick-kneeBurhinus capensis22.223.57Sputed Thick-kneeButorides striata10.003.57Strike HeronButorides striata10.003.57Striged KingfisherHalcyon chelicuti1.110.00Swallow-tailed Bee-eaterMerops hirundineus42.228.33Tawny EagleAquila rapax4.440.00xThree-banded PloverCharadrius tricollaris12.222.38Verreaux's Eagle-OwlBubo lacteus1.111.19Violet-eared Waxbill	Southern Masked Weaver	Ploceus velatus	71.11	11.90	-	-		
Southern Red BishopEuplectes orix40.008.33-×Southern White-faced Scops OwlPtilopsis granti3.330.00×Southern Yellow-billed HornbillTockus leucomelas13.332.38×Speckled MousebirdColius striatus1.110.00×Speckled PigeonColumba guinea58.894.76-××Speckled PigeonColumba guinea58.894.76-××Spike-heeled LarkChersomanes albofasciata31.113.57-××Spotted Eagle-OwlBubo africanus7.780.00Spotted FlycatcherMuscicapa striata32.220.00Spotted Thick-kneeBurhinus capensis22.223.57Spur-winged GoosePlectropterus gambensis15.561.19Striated HeronButorides striata10.003.57Swainson's SpurfowlPternistis swainsonii23.333.57Swainson's SpurfowlPternistis swainsonii23.33Tawny EagleAquila rapax4.440.00-××Three-banded PloverCharadrius tricollaris12.222.38-Verreaux's Eagle-OwlBubo lacteus1.111.19	Southern Pochard	Netta erythrophthalma	7.78	1.19	-	-		
Southern White-faced Scops OwlPtilopsis granti3.330.00-Southern Yellow-billed HornbillTockus leucomelas13.332.38-Speckled MousebirdColius striatus1.110.00-Speckled PigeonColumba guinea58.894.76-Speckled PigeonColumba guinea58.894.76-Speckled PigeonColumba guinea58.894.76-Speckled PigeonColumba guinea7.780.00-Spotted Eagle-OwlBubo africanus7.780.00-Spotted FlycatcherMuscicapa striata32.220.00-Spotted Thick-kneeBurhinus capensis22.223.57-Spur-winged GoosePlectropterus gambensis15.561.19-Striated HeronButorides striata10.003.57-Striated HeronButorides striata10.00Swainson's SpurfowlPternistis swainsonii23.333.57-Swainson's SpurfowlPternistis swainsonii23.33Tawny EagleAquila rapax4.440.00Termminck's CourserCursorius terminckii4.440.00Verreaux's Eagle-OwlBubo lacteus1.111.19Violet-eared WaxbillGranatina granatina34.442.38	Southern Red Bishop	Euplectes orix	40.00	8.33	-	-		х
Southern Yellow-billed HornbillTockus leucomelas13.332.38-Speckled MousebirdColius striatus1.110.00Speckled PigeonColumba guinea58.894.76xSpike-heeled LarkChersomanes albofasciata31.113.57xxSpotted Eagle-OwlBubo africanus7.780.00Spotted FlycatcherMuscicapa striata32.220.00Spotted Thick-kneeBurhinus capensis22.223.57Sput-winged GoosePlectropterus gambensis15.561.19Strik's LarkSpizocorys starki1.110.00Striged KingfisherHalcyon chelicuti1.110.00Swainson's SpurfowlPternistis swainsonii23.333.57 </td <td>Southern White-faced Scops Owl</td> <td>, Ptilopsis granti</td> <td>3.33</td> <td>0.00</td> <td>-</td> <td>-</td> <td></td> <td></td>	Southern White-faced Scops Owl	, Ptilopsis granti	3.33	0.00	-	-		
Speckled MousebirdColius striatus1.110.00Speckled PigeonColumba guinea58.894.76xSpike-heeled LarkChersomanes albofasciata31.113.57xSpotted Eagle-OwlBubo africanus7.780.00Spotted FlycatcherMuscicapa striata32.220.00Spotted Thick-kneeBurhinus capensis22.223.57Spur-winged GoosePlectropterus gambensis15.561.19Stark's LarkSpizocorys starki1.110.00Striated HeronButorides striata10.003.57Striged KingfisherHalcyon chelicuti1.110.00Swainson's SpurfowlPternistis swainsonii23.333.57Swallow-tailed Bee-eaterMerops hirundineus42.228.33Tawny EagleAquila rapax4.440.00VUENTerminck's CourserCursorius temminckii4.440.00xThree-banded PloverCharadrius tricollaris12.222.38-Violet-eared WaxbillGranatina granatina34.442.38-	Southern Yellow-billed Hornbill	Tockus leucomelas	13.33	2.38	-	-		
Speckled PigeonColumba guinea58.894.76xSpike-heeled LarkChersomanes albofasciata31.113.57xxSpotted Eagle-OwlBubo africanus7.780.00xSpotted FlycatcherMuscicapa striata32.220.00Spotted Thick-kneeBurhinus capensis22.223.57Sput-winged GoosePlectropterus gambensis15.561.19Stark's LarkSpizocorys starki1.110.00Striated HeronButorides striata10.003.57Striged KingfisherHalcyon chelicuti1.110.00Swainson's SpurfowlPternistis swainsonii23.333.57Swallow-tailed Bee-eaterMerops hirundineus42.228.33Temminck's CourserCursorius temminckii4.440.00xThree-banded PloverCharadrius tricollaris12.222.38Verreaux's Eagle-OwlBubo lacteus1.111.19Violet-eared WaxbillGranatina granatina34.442.38	Speckled Mousebird	Colius striatus	1.11	0.00	-	-		
Spike-heeled LarkChersomanes albofasciata31.113.57-×××Spotted Eagle-OwlBubo africanus7.780.00Spotted FlycatcherMuscicapa striata32.220.00Spotted Thick-kneeBurhinus capensis22.223.57Sputed Thick-kneeBurhinus capensis15.561.19Sput-winged GoosePlectropterus gambensis15.561.19Stark's LarkSpizocorys starki1.110.00Striated HeronButorides striata10.003.57Striged KingfisherHalcyon chelicuti1.110.00Swainson's SpurfowlPternistis swainsonii23.333.57Swallow-tailed Bee-eaterMerops hirundineus42.228.33Tawny EagleAquila rapax4.440.00xxThree-banded PloverCharadrius tricollaris12.222.38xVerreaux's Eagle-OwlBubo lacteus1.111.19Violet-eared WaxbillGranatina granatina34.442.38	Speckled Pigeon	Columba guinea	58.89	4.76	-	-		х
Spotted Eagle-OwlBubo africanus7.780.00Spotted FlycatcherMuscicapa striata32.220.00Spotted Thick-kneeBurhinus capensis22.223.57Spur-winged GoosePlectropterus gambensis15.561.19Stark's LarkSpizocorys starki1.110.00Striated HeronButorides striata10.003.57Striped KingfisherHalcyon chelicuti1.110.00Swainson's SpurfowlPternistis swainsonii23.333.57Swallow-tailed Bee-eaterMerops hirundineus42.228.33Tawny EagleAquila rapax4.440.00VUENxThree-banded PloverCharadrius tricollaris12.222.38Verreaux's Eagle-OwlBubo lacteus1.111.19Violet-eared WaxbillGranatina granatina34.442.38	Spike-heeled Lark	Chersomanes albofasciata	31.11	3.57	-	-	х	х
Spotted FlycatcherMuscicapa striata32.220.00Spotted Thick-kneeBurhinus capensis22.223.57Spur-winged GoosePlectropterus gambensis15.561.19Stark's LarkSpizocorys starki1.110.00Striated HeronButorides striata10.003.57Striped KingfisherHalcyon chelicuti1.110.00Swainson's SpurfowlPternistis swainsonii23.333.57Swallow-tailed Bee-eaterMerops hirundineus42.228.33Tawny EagleAquila rapax4.440.00VUENxThree-banded PloverCharadrius tricollaris12.222.38Verreaux's Eagle-OwlBubo lacteus1.111.19Violet-eared WaxbillGranatina granatina34.442.38	Spotted Eagle-Owl	Bubo africanus	7.78	0.00	-	-		
Spotted Thick-kneeBurhinus capensis22.223.57Spur-winged GoosePlectropterus gambensis15.561.19Stark's LarkSpizocorys starki1.110.00Striated HeronButorides striata10.003.57Striped KingfisherHalcyon chelicuti1.110.00Swainson's SpurfowlPternistis swainsonii23.333.57Swallow-tailed Bee-eaterMerops hirundineus42.228.33Tawny EagleAquila rapax4.440.00VUENThree-banded PloverCharadrius tricollaris12.222.38Verreaux's Eagle-OwlBubo lacteus1.111.19Violet-eared WaxbillGranatina granatina34.442.38	Spotted Flycatcher	Muscicapa striata	32.22	0.00	-	-		
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Violet-eared Waxbill Granatina granatina 34.44 2.38	Verreaux's Eagle-Owl	Bubo lacteus	1.11	1.19	-	-		<u> </u>
	Violet-eared Waxbill	Granatina granatina	34.44	2.38	-	-	1	1

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Species name	Scientific name	SABAP 2 Full protocol reporting rate	SABAp2 Ad hoc protocol reporting rate	Global status	Regional status	Recorded during surveys in 2010/2011	Recorded during surveys in 2022
Wattled Starling	Creatophora cinerea	37.78	3.57	-	-		
Western Barn Owl	Tyto alba	31.11	4.76	-	-		
Western Cattle Egret	Bubulcus ibis	55.56	16.67	-	-		х
Whiskered Tern	Chlidonias hybrida	5.56	0.00	-	-		
White Stork	Ciconia ciconia	1.11	0.00	-	-		
White-backed Mousebird	Colius colius 47.78 1.19 -		-	-			
White-backed Vulture	Gyps africanus	74.44	36.90	CR	CR	х	
White-bellied Sunbird	Cinnyris talatala	15.56	0.00	-	-		
White-breasted Cormorant	Phalacrocorax lucidus	11.11	0.00	-	-		
White-browed Sparrow-Weaver	Plocepasser mahali	82.22	15.48	-	-	х	
White-faced Whistling Duck	Dendrocygna viduata	10.00	3.57	-	-		
White-fronted Bee-eater	Merops bullockoides	12.22	0.00	-	-		
White-rumped Swift	Apus caffer	28.89	2.38	-	-		х
White-throated Canary	Crithagra albogularis	2.22	0.00	-	-		
White-throated Robin-Chat	Cossypha humeralis	1.11	0.00	-	-		
White-throated Swallow	Hirundo albigularis	18.89	3.57	-	-		х
White-winged Tern	Chlidonias leucopterus	4.44	0.00	-	-		
Willow Warbler	Phylloscopus trochilus	5.56	0.00	-	-		
Wood Sandpiper	Tringa glareola	1.11	1.19	-	-		
Yellow Canary	Crithagra flaviventris	70.00	5.95	-	-		
Yellow-bellied Eremomela	Eremomela icteropygialis	16.67	1.19	-	-		
Yellow-billed Duck	Anas undulata	18.89	3.57	-	-		
Yellow-billed Stork	Mycteria ibis	1.11	0.00	-	EN		
Yellow-crowned Bishop	Euplectes afer	5.56	0.00	-	-		
Zitting Cisticola	Cisticola juncidis	23.33	3.57	-	-		

7.2.1 Conclusion

- No new avifaunal sensitivities were recorded during the site inspection in October 2022 that had not already been identified previously in the Avian Impact Assessment Report (SiVEST 2013).
- No nests of Red Data priority species were recorded during the site inspection in October 2022.
- The site inspection in October 2022 confirmed that the findings of the Avian Impact Assessment Report (SiVEST 2013) are still valid and applicable, as the receiving environment had not changed in any material way.
- It is recommended that the validity of the Environmental Authorisation be extended by an additional 3 years.

The proposed amendments are acceptable from an avifaunal perspective and will not change the nature or level of impact assessed. No additional mitigation measures will be required other than what was recommended in the original Avian Impact Assessment Report (SiVEST 2013). It is therefore recommended that the validity of the Environmental Authorisation be extended by an additional 3 years.

7.3 Impacts on Heritage

It is noted by the specialist that no changes to the layout and infrastructure from the original layouts are proposed and only the extension of the EA.

The evaluation of the original HIA and subsequent documentation has shown that it is envisaged no changes to the projected impact.

The management measures as included in the HIA (2012) remains true and needs to be implemented and is listed below.

- A monitoring plan must be agreed upon by all the stakeholders for the different phases of the project. The developer undertakes to give the archaeologist sufficient time to identify and record and archaeological finds and features.
- If during construction any possible finds are made, the operations must be stopped, and the qualified archaeologist be contacted for an assessment of the find.
- Should substantial fossil remain (e.g. well-preserved fossil fish, reptiles or petrified wood) be exposed during construction, however, the ECO should carefully safeguard these, preferably in situ, and alert SAHRA as soon as possible so that appropriate action (e.g. recording, sampling or collection) can be taken by a professional palaeontologist.
- A management plan must be developed for managing the heritage resources in the surface area impacted by operations during the construction and operation of the development. This includes basic training for construction staff on possible finds, action steps for mitigation measures, surface collections, excavations, and communication routes to follow in the case of a discovery.

7.3.1 Conclusion

It is our considered opinion that the extension of the EA for the authorised Droogfontein 3 PV will not have any additional impacts on the heritage resources inventory identified for the project as part of the original heritage study (Fourie, PGS, 2012). We conclude that this proposed extension of the EA can proceed from a heritage perspective.

7.4 Impacts on Visual

The proposed changes to the EA are considered to be purely administrative and will not give rise to additional visual impacts or exacerbate the impacts previously identified in the VIA for this development.

7.4.1 Conclusion

Furthermore, no additional recommendations or mitigation measures will be required, and all of the mitigation measures set out in the original VIA remain valid.

7.5 Impacts on Geotech

The previous geotechnical reports (Bernard, 2012 and Gibbs, 2013) suggests the sub-surface profiles on the sites comprises a thin sandy topsoil horizon, underlain by shallow 'competent' material of weakly cemented calcite/sandstone/siltstone. The BESS desktop assessment reports concluded the development of the sites will have a "Negative Low Impact" with no fatal flaws being identified that would render the proposed BESS site unsuitable. Considering the proposed changes to the 75MW Droogfontein Photovoltaic (PV) Solar Energy Facility, from the geotechnical perspective, it is expected that there are unlikely to be any additional geotechnical impacts to those previously identified.

It is also most unlikely that the proposed changes to the project would either increase or reduce the significance of the impacts as assessed.

Regarding the above amendments, it is expected that no additional geotechnical impacts will arise to those previously identified. The proposed changes are not expected to decrease or increase any impact previously stated

7.5.1 Conclusion

From a geotechnical and geological perspective, no fatal flaws, sensitivities or areas to avoid arise from the above amendments. It is therefore recommended that the proposed activity be authorised.

7.6 Impacts on Surface Water

The entire extent of the PV area, and associated infrastructure were previously assessed in terms of the EIA Regulations, 2014 (as amended). The aquatic biodiversity impact was confirmed to be very low. This is largely due to the lack of surface water resources within and around the site. The impacts and recommendations that were originally documented have not changed. Since the inception of the project, there have been no visible impacts from the existing PV areas, indicating that the impact of this activity is low and that the EMPr has been adhered to.

7.6.1 Conclusion

It is hereby recommended that the validity of the Environmental Authorisation be extended and the original input to the EMPr be kept the same.

7.7 Impacts on Agricultural

The impact rating as provided in the initial assessment remains valid. The mitigation measures provided in the initial assessment are still applicable. There are no new mitigation measures which need to be included into the EA.

7.7.1 Conclusion

The conclusions about the agricultural potential of the study area in the original assessment are completely valid and are verified in this assessment as still being true

7.8 Impacts on Social

The proposed changes to the EA are considered to be purely administrative and will not give rise to additional social impacts or exacerbate the impacts previously identified in the SIA for this development.

7.8.1 Conclusion

Based on an initial review of the impact assessment previously undertaken and the current state of the social environment, the proposed extension is unlikely to have a significant impact.

CUMULATIVE IMPACTS AND MITIGATION MEASURES IDENTIFIED 8 WITHIN THE ORIGINAL EIA REPORT

8.1 **Cumulative Impacts**

Table 7: Cumulative impacts and proposed mitigation measures

Environmental Component	Cumulative Impact			
Biodiversity Impact	Construction			
Assessment	Due to the negligible amount of infrastructure present within			
	the study area, cumulative impacts are anticipated to be low			
	during construction.			
	Operation			
	Cumulative impacts during the operation phase relate mainly			
	to avifauna. However suitable mitigation measures			
	recommended in this report can reduce these impacts. In			

Environmental Component	Cumulative Impact
	addition the additional infrastructure to be added is very small
	in comparison to that already present. It is recommended that
	the client enter into discussions with Eskom to investigate the
	possibility to adding bird flappers to the existing power line
	infrastructure in order to reduce the current impact present.
	 Decommissioning
	Decommissioning of the plant will result in the elimination of
	the cumulative impacts mentioned above.
	 Residual Impacts
	If rehabilitation of the site is done efficiently and according to
	the Environmental Management Programme, no residual
	impacts on biodiversity are anticipated.
Groundwater Impact	 Construction Phase
Assessment	Cumulative impacts are considered unlikely for the
	construction phase, since the timescales are relatively short.
	Operation Phase
	cumulative impacts for the operation phase have been
	classified as Medium, since minor cumulative effects may
	increased groundwater recharge combines with groundwater
	nollution leading to more rapid migration of contaminants
	away from the site
Visual Impact Assessment	None foreseen
Heritage Impact Assessment	None foreseen
Tourism Impact Assessment	None foreseen
Socio-economic Impact	
Assessment	The socio – economic data is presented in respect of the
	75MW Droogfontein CPV/PV 2 plant being a standalone
	project. At the time of the compilation of the original EIA
	Report, preferred bidders for the 'REBID' round 1 submission
	had not yet been announced. In December 2011, 28
	Preferred Bidders were announced of which one is located in

Environmental Component	Cumulative Impact
	the Kimberley area. This is the Mainstream Renewable
	Power PV (50MW). This entity has until 30th June 2012 to
	reach financial close.
	Details for the impacts of this project are difficult to determine
	at this point. At the time of writing of this report, the proposed
	project had not been guaranteed to reach the construction
	phase and hence the realization of the economic impacts
	could not be confirmed.
	There exists then the potential cumulative impact (positive
	and negative) of one renewable energy project within the
	Kimberley area. Those potential impacts could include the
	lollowing.
	Positive:
	 Increase in indirect iob creation:
	 Increase in local economy: and
	 Provision of jobs.
	Negative:
	 Strain on available workforce;
	 Impact on municipal infrastructure;
	 Increase in crime; and
	 Increase in spread of HIV/Aids
	Mainstream is the project proponent and is mindful that the
	cumulative effect will have both positive and negative effects
	for itself and the Kimberley area.
	Construction Phase
	i The influx of people could result in minor cumulative
	effects, depending on the number of unemployed job
	seekers that also enter the area in addition to the
	construction team . However, this impact can be
	intensified by the influx of other construction teams on
	the other Mainstream PV plant developments in the
	area.
	ii. An additional demand on municipal services could
	result in minor cumulative impacts if services become

Environmental Component	Cumulative Impact
	strained, which in turn would impact mildly on
	permanent residents.
	III. HIV infection adds to the current HIV infection rate in
	the province and the country, thereby taxing health resources further in combating the disease
	iv If conflict situation arise during the integration with the
	local community members these may potentially flare
	into further negative cumulative effects although this is
	unlikely as relatively few people will arrive during this
	nhase
	Operation Phase
	i. A breakdown in municipal services would affect the
	whole of the locality, although this is highly unlikely.
	ii. The community would be uplifted through certain
	interventions, which means that they are more able to
	find employment and gain skills, which in turn could
	impact positively on the individual and family,
	concerned.
	iii. The presence of the CPV/ PV plant can set an
	unintended precedent for land use change, which in
	future can lead to cumulative impacts. This impact
	becomes all the more likely due to the fact that
	another PV plant is proposed for the Kimberley area.
	iv. The potential sense of place impact may be
	significant, especially for immediately located
	settlements and businesses.

8.2 Mitigation/ Management Measures

8.2.1 Biodiversity

Ideally it is preferable to place the infrastructure away from the sensitive areas identified and away from habitat that may house Red Data species.

Mitigation measures in this report are adopted for floral and faunal protection.

Pre-construction site specific mitigation measures

- An ecologist should be available when site clearing takes place to ensure that any uncovered species are protected from destruction (It is important to remember that even though these species have not been encountered, they could be in a dormant stage and suddenly arise during construction due to more favourable conditions.
- Demarcation of sensitive areas prior to construction activities starting.
- Construction site specific mitigation measures

The following mitigation measures are recommended for the study area:

- Care taken during construction given the presence of Giant Bullfrogs in the wider area. Should frogs be discovered, a herpetologist should be contacted to suitably relocate the specimen.
- Use of appropriate construction methods in the sensitive area.
- A copy of the Environmental Impact Report and associated Environmental Management Programme as well as the specialist study must be present at the construction site for easy reference to specialist recommendations in sensitive areas.
- It is recommended that the construction crew be educated about the sensitivities involved in these areas as well as the potential species they could encounter. A poster of sensitive species (compiled by a qualified specialist) should be kept on the construction site for easy reference.
- Rehabilitation to be undertaken as soon as possible after construction in sensitive area has been completed
- Only vegetation within the study area must be removed.
- Vegetation removal must be phased in order to reduce impact of construction.
- Construction site office and laydown areas must be clearly demarcated and no encroachment must occur beyond demarcated areas.
- All natural areas impacted during construction must be rehabilitated with locally indigenous plant species.
- A buffer zone should be established in areas where construction will not take place to ensure that construction activities do not extend into these areas.
- Construction areas must be well demarcated and these areas strictly adhered to.
- The use of pesticides and herbicides in the study area must be discouraged as these impacts on important pollinator species of indigenous vegetation.
- Soils must be kept free of petrochemical solutions that may be kept on site during construction. Spillage can result in a loss of soil functionality thus limiting the re-establishment of flora.
- Operation Site Specific Mitigation Measures

The following mitigation measures are recommended for the study area

- Six monthly checks of the area should take place for the emergence of invader species.
- Mitigation measures mentioned for the construction phase above must be implemented for any maintenance of the development that may be undertaken during the operation phase.
- Correct rehabilitation with locally indigenous species.
- Monitoring programme to ensure that rehabilitation efforts are successful to ensure that risks such as erosion and the edge effect are avoided.
- Constant maintenance of the area to ensure re-colonisation of floral species.
- Regular removal of alien species which may jeopardise the proliferation of indigenous species.
- More recent information should be consulted to ensure that no Red Data species have colonised the areas which were previously rehabilitated.
- Decommissioning Mitigation and Management measures

All mitigation measures applied during construction will apply to the decommissioning phase of the project.

Achievability of Mitigation Measures

Mitigation measures included within this report are feasible and will be easy to achieve. Several of the mitigation measures included here are generic in nature and have been implemented successfully on several different construction sites. The unique mitigation measures stated in this report are also achievable and it is essential that these are taken into account when the proposed development is constructed.

Management and Monitoring

It is recommended that a formal monitoring and reporting strategy/protocol be developed for monitoring the impact on the vegetation and biodiversity in general in the area during construction. This will ensure that the mitigation measures stipulated for the construction are well enforced and the identified impacts minimised as much as possible.

Specific areas of concern that require strict monitoring include:

- Containment of construction to the demarcated area
- Erosion control
- Emergence of alien species
- Rehabilitation of the site
- Containment of construction near sensitive areas

If Red Data species are located during construction, the relevant permits must be applied for from the relevant authorities. No listed plants may be removed without these permits. It will be the responsibility of the ECO to ensure that these permits are in place where necessary.

The precautionary principle should be applied during the construction and care taken to implement the recommended mitigation measures.

Rehabilitation

Once the proposed development has been constructed, rehabilitation needs to take place. This needs to take place timeously to ensure that alien plant emergence and erosion do not occur.

8.2.2 Surface Water

- Site specific mitigation measures will be needed to prevent the spillage and/or leakage of oils, fuels and other toxic substances entering the wetlands. Firstly, all vehicles will need to be checked for leakage before and after entering the construction area. Secondly areas where fuels are either kept or transferred will need to be bunded so as to contain spillage. Cement mixing sites will also need to be strategically designated and at least 100metres away from the wetland areas. Ablution facilities must be provided to prevent workers urinating near or in the wetlands.
- The loss of vegetation is inevitable and necessary for the proposed development to take place. Hence, the impact of vegetation clearance will be definite. Mitigation measures primarily will relate to the cumulative impacts associated with exposed open stretches of land. Run-off is to be mitigated by the use of structures that will reduce the rate and volume of run-off so as to prevent erosion and siltation impacts affecting nearby wetlands. Structures can include silt nets, grass blocks and any other related structure that can prevent silt build-up and erosion. In terms of potential impacts associated with wind erosion, regular but light watering must take place whilst surfaces are left exposed.
- The development and implementation of an adequate storm water management plan to be designed by an appropriate engineer. Here, the engineer should account for both natural run-off (that which can be released into the natural landscape with no detrimental effect) and excess artificial run-off generated by the proposed development structures. Attenuation dams and evaporation ponds are examples that can contain storm water run-off. Other structures that may be considered are semi-permeable surfaces that can absorb artificial run-off but releases a certain amount into the landscape. Energy dissipating structures can also be used. Such structures can reduce the amount and rate of excess run-off generated by the proposed development entering wetlands and thereby prevent the onset of erosion.
- Transformer oils mitigation measures Standard measures are typically accommodated in the design of the substation to ensure that should an accident occur which may cause spillage of this oil, that it would not pollute the surrounding soils or any runoff from the substation. The transformers are typically housed within a concrete bund that would be linked

to an oil holding dam within the footprint of the substation and plants. Should contaminated water enter the oil holding dam, this would typically be removed from the site, and would be recycled off-site as part of the remediation process. It is important that such design-related mitigation measures be incorporated into the substation design to minimise the risk of any oil spillage being transported off the site.

8.2.3 Groundwater

Mitigation measures for all phases of the plant should include the following (see impact tables above for more details):

- Inventories should be made of all substances that are potentially hazardous to groundwater, which will be stored, used or transported over the sites. The risk of each substance to the groundwater should be considered.
- All areas in which substances potentially hazardous to groundwater are stored, loaded, worked with or disposed of should be securely bunded (impermeable floor and sides) to prevent accidental discharge to groundwater.

8.2.4 Visual

- Carefully plan to reduce the construction period as far as possible.
- Locate laydown and storage areas in zones of low visibility i.e. behind exiting wooded vegetation or in lower lying areas.
- Minimise vegetation clearing and rehabilitate cleared areas as soon as possible.
- Maintain a neat construction site by removing rubble and waste materials regularly.
- Make use of existing gravel access roads where possible.
- Limit construction activities to day-time hours in order to minimise night lighting during construction. If construction, is to take place at night neighbouring land owners will have to be informed.
- Make use of fittings that focus the light and prevent light spill.
- Direct perimeter lighting in a downward direction toward the site in a western direction.
- Limit the use of flood lighting where possible.

8.2.5 Heritage

Management Guidelines

The National Heritage Resources Act (Act 25 of 1999) states that, any person who intends to undertake a development categorised as-

- the construction of a road, wall, transmission line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- the construction of a bridge or similar structure exceeding 50m in length;

any development or other activity which will change the character of a site-

- exceeding 5 000 m² in extent; or
- involving three or more existing erven or subdivisions thereof; or
- involving three or more erven or divisions thereof which have been consolidated within the past five years; or
- the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- the re-zoning of a site exceeding 10 000 m² in extent; or
- any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

In the event that an area previously not included in an archaeological or cultural resources survey is to be disturbed, the South African Heritage Resources Agency (SAHRA) needs to be contacted. An enquiry must be lodged with them into the necessity for a Heritage Impact Assessment.

In the event that a further heritage assessment is required it is advisable to utilise a qualified heritage practitioner preferably registered with the Cultural Resources Management Section (CRM) of the Association of Southern African Professional Archaeologists (ASAPA).

This survey and evaluation must include:

- The identification and mapping of all heritage resources in the area affected;
- An assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6 (2) or prescribed under section 7 of the National Cultural Resources Act;
- An assessment of the impact of the development on such heritage resources;
- An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
- The results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
- If heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- Plans for mitigation of any adverse effects during and after the completion of the proposed development.

It is advisable that an information section on cultural resources be included in the SHEQ training given to contractors involved in surface earthmoving activities. These sections must include basic information on:

Heritage;

- Graves;
- Archaeological finds; and
- Historical Structures.

This module must be tailor made to include all possible finds that could be expected in that area of construction.

In the event that a possible find is discovered during construction, all activities must be halted in the area of the discovery and a qualified archaeologist contacted. The archaeologist needs to evaluate the finds on site and make recommendations towards possible mitigation measures.

If mitigation is necessary, an application for a rescue permit must be lodged with SAHRA. After mitigation an application must be lodged with SAHRA for a destruction permit. This application must be supported by the mitigation report generated during the rescue excavation. Only after the permit is issued may such a site be destroyed.

If during the initial survey sites of cultural significance is discovered, it will be necessary to develop a management plan for the preservation, documentation or destruction of such a site. Such a program must include an archaeological/palaeontological monitoring programme, timeframe and agreed upon schedule of actions between the company and the archaeologist. In the event that human remains are uncovered or previously unknown graves are discovered a qualified archaeologist needs to be contacted and an evaluation of the finds made.

If the remains are to be exhumed and relocated, the relocation procedures as accepted by SAHRA needs to be followed. This includes an extensive social consultation process.

The definition of an archaeological/palaeontological monitoring programme is a formal program of observation and investigation conducted during any operation carried out for non-archaeological reasons. This will be within a specified area or site on land, inter-tidal zone or underwater, where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive.

The purpose of an archaeological/ palaeontological monitoring programme is:

- To allow, within the resources available, the preservation by record of archaeological/palaeontological deposits, the presence and nature of which could not be established (or established with sufficient accuracy) in advance of development or other potentially disruptive works
- To provide an opportunity, if needed, for the watching archaeologist to signal to all interested parties, before the destruction of the material in question, that an archaeological/palaeontological find has been made for which the resources allocated to the

watching brief itself are not sufficient to support treatment to a satisfactory and proper standard.

- A monitoring programme is not intended to reduce the requirement for excavation or preservation of known or inferred deposits, and it is intended to guide, not replace, any requirement for contingent excavation or preservation of possible deposits.
- The objective of the monitoring is to establish and make available information about the archaeological resource existing on a site.

PGS can be contacted on the way forward in this regard.

ROLE	RESPONSIBILITY	IMPLEMENTATION
A responsible specialist needs to be	The client	Archaeologist and a
allocated and should sit in at all relevant		competent archaeology
meetings, especially when changes in		supportive team
design are discussed, and liaise with		
SAHRA.		
If chance finds and/or graves or burial	The client	Archaeologist and a
grounds are identified during construction		competent archaeology
or operational phases, a specialist must		supportive team
be contacted in due course for evaluation.		
Comply with defined national and local	The client	Environmental
cultural heritage regulations on		Consultancy and the
management plans for identified sites.		Archaeologist
Consult the managers, local communities	The client	Environmental
and other key stakeholders on mitigation		Consultancy and the
of archaeological sites.		Archaeologist
Implement additional programs, as	The client	Environmental
appropriate, to promote the safeguarding		Consultancy and the
of our cultural heritage. (i.e. integrate the		Archaeologist,
archaeological components into		
employee induction course).		
If required, conservation or relocation of	The client	Archaeologist, and/or
burial grounds and/or graves according to		competent authority for
the applicable regulations and legislation.		relocation services
Ensure that recommendations made in	The client	The client
the Heritage Report are adhered to.		
Provision of services and activities related	The client	Environmental
to the management and monitoring of		Consultancy and the
significant archaeological sites.		Archaeologist
After the specialist/archaeologist has	Client and Archaeologist	Archaeologist

ROLE	RESPONSIBILITY	IMPLEMENTATION
been appointed, comprehensive feedback		
reports should be submitted to relevant		
authorities during each phase of		
development.		

- All phases of the project
- Archaeology

Based on the findings of the HIA, all stakeholders and key personnel should undergo an archaeological induction course during this phase. Induction courses generally form part of the employees' overall training and the archaeological component can easily be integrated into these training sessions. Two courses should be organised – one aimed more at managers and supervisors, highlighting the value of this exercise and the appropriate communication channels that should be followed after chance finds, and the second targeting the actual workers and getting them to recognize artefacts, features and significant sites. This needs to be supervised by a qualified archaeologist. This course should be reinforced by posters reminding operators of the possibility of finding archaeological/palaeontological sites.

The project will encompass a range of activities during the construction phase, including ground clearance, establishment of construction camps area and small scale infrastructure development associated with the project.

It is possible that cultural material will be exposed during operations and may be recoverable, but this is the high-cost front of the operation, and so any delays should be minimised. Development surrounding infrastructure and construction of facilities results in significant disturbance, but construction trenches do offer a window into the past and it thus may be possible to rescue some of the data and materials. It is also possible that substantial alterations will be implemented during this phase of the project and these must be catered for. Temporary infrastructure is often changed or added to the subsequent history of the project. In general these are low impact developments as they are superficial, resulting in little alteration of the land surface, but still need to be catered for.

During the construction phase, it is important to recognize any significant material being unearthed, to make the correct judgment on which actions should be taken. A responsible archaeologist/palaeontologist must be appointed for this commission. This person does not have to be a permanent employee, but needs to sit in at relevant meetings, for example when changes in design are discussed, and notify SAHRA of these changes. The archaeologist would inspect the site and any development recurrently, with more frequent visits to the actual workface and operational areas.

In addition, feedback reports can be submitted by the archaeologist to the client and SAHRA to ensure effective monitoring. This archaeological monitoring and feedback strategy should be incorporated into the Environmental Management Programme (EMPr) of the project. Should an archaeological/palaeontological site or cultural material be discovered during construction (or operation), such as burials or grave sites, the project needs to be able to call on a qualified expert to make a decision on what is required and if it is necessary to carry out emergency recovery. SAHRA would need to be informed and may give advice on procedure. The developers therefore should have some sort of contingency plan so that operations could move elsewhere temporarily while the material and data are recovered. The project thus needs to have an archaeologist/palaeontologist available to do such work. This provision can be made in an archaeological/palaeontological monitoring programme.

Graves

In the case where a grave is identified during construction the following measures must be taken.

- Mitigation of graves will require a fence around the cemetery with a buffer of at least 20 meters.
- If graves are accidentally discovered during construction, activities must cease in the area and a qualified archaeologist be contacted to evaluate the find. To remove the remains a rescue permit must be applied for with SAHRA and the local South African Police Services must be notified of the find.
- Where it is then recommended that the graves be relocated a full grave relocation process that includes comprehensive social consultation must be followed.

The grave relocation process must include:

- A detailed social consultation process, that will trace the next-of-kin and obtain their consent for the relocation of the graves, that will be at least 60 days in length;
- Site notices indicating the intent of the relocation
- Newspaper Notice indicating the intent of the relocation
- A permit from the local authority;
- A permit from the Provincial Department of health;
- A permit from the South African Heritage Resources Agency if the graves are older than 60 years or unidentified and thus presumed older than 60 years;
- An exhumation process that keeps the dignity of the remains intact;
- An exhumation process that will safeguard the legal implications towards the developing company;
- The whole process must be done by a reputable company that are well versed in relocations;
- The process must be conducted in such a manner as to safeguard the legal rights of the families as well as that of the developing company.

Paleontology

The Palaeontological desktop study found that, the impact of the proposed development on local fossil heritage considered to be *low* and specialist palaeontological mitigation is not considered necessary.

The following general mitigation measures are recommended:

- A monitoring plan must be agreed upon by all the stakeholders for the different phases of the project focussing on the areas where earthmoving will occur.
- If during construction any possible finds are made, the operations must be stopped and the qualified archaeologist be contacted for an assessment of the find.
- Should substantial fossil remains (e.g. well-preserved fossil fish, reptiles or petrified wood) be exposed during construction, however, the ECO should carefully safeguard these, preferably in situ, and alert SAHRA as soon as possible so that appropriate action (e.g. recording, sampling or collection) can be taken by a professional palaeontologist.
- A management plan must be developed for managing the heritage resources in the surface area impacted by operations during construction and operation of the development. This includes basic training for construction staff on possible finds, action steps for mitigation measures, surface collections, excavations, and communication routes to follow in the case of a discovery.

8.2.6 Tourism

- Visual Impact
 - Areas with significant tourism facilities in the study area should be avoided completely
 - Vegetation clearing should be minimised and the area rehabilitated as soon as possible to minimise visual impacts along Riverton road
- Land Use
 - Areas with significant tourism facilities in the study area should be avoided completely
- Corporate Demand
 - Creating demand through appropriate marketing of tourism assets in the area.
 - Improvement of tourism infrastructure by establishing an up to date tourism information office so as to increase tourism demand.
 - Identification and Development of new tourist attractions
 - Creating demand through appropriate marketing of tourism assets in the area.

8.2.7 Socio-economic

Construction

Construction activities have the potential to largely impact on the social environment. Thus social mitigation measures ensure that construction activities are managed in such a manner that the positive impacts may be enhanced and the negative impacts are minimised as far as possible.

- Influx of People
 - It is recommended that the construction workers be housed in existing dwellings as they are numerous and are currently serviced.
 - Ensure that employment procedures/polices are communicated to local stakeholders, especially community representative organisations and ward councillors.
 - Have clear rules and regulations for access to the construction site to control loitering. Consult with the local SAPS to establish standard operating procedures for the control and/or removal of loiterers at the construction site.
- Change to Municipal Infrastructure
 - Contractors to supply and install, at their own cost, infrastructure needed to access municipal services, e.g. water and sewerage pipelines. On site, sufficient portable services must be available (e.g. portable toilet facilities) and serviced regularly to prevent contamination.
 - Inform residents in advance, if any blasting is going to take place. The contractor must repair any damages to houses as a direct result of blasting as soon as possible and at the contractor's cost.
 - MRP and its appointed contractor(s) must deliver on their undertakings with local communities in terms of employment allocation and any other commitments made. Any problems that occur as a direct result of any of the construction activities should be addressed effectively and without delay, and in consultation with the affected parties, if so required.
 - Contractors must comply with the mitigation and/or enhancement measures stipulated in the EMPr. Corrective measures must be implemented where the EMPr has not been adhered to.
- Integration with Local Communities
 - An aggressive STI and HIV/AIDS awareness campaign should be launched, which is not only directed at construction workers but also at the community as a whole. To accomplish this, a Health & Safety Plan should be developed and implemented, including a HIV prevention plan.
 - Access at the construction site should be controlled to prevent sex workers from either visiting and/or loitering at the construction village or the construction sites.

- Local women should be empowered. This could be achieved by employing them to work on the project, which in turn would decrease their (financial) vulnerability.
- Every viable step must be taken to reduce substance abuse on the part of the crew as this will diminish local confidence in them and increase the likelihood of risk behaviour.
- Measures should be introduced (educational or institutional interventions) to reduce and curb the prevalence of substance abuse in the nearby Roodepan and Riverton areas.
- Operation

Impacts that occur during the Operation and Maintenance phase have the potential to occur over a prolonged period and therefore particular attention should be paid to the mitigation of such impacts to either reduce the severity of the impacts or the duration of the impact.

- Increase in Housing Needs/Demands
 - None would be required where operational staff is required to secure housing in their private capacity.
- Corporate Social Investment
 - Consult with the community to determine their needs. Following a top-down approach without community consultation can result in irrelevant interventions that are disregarded by the community.
- Sense of Place
 - Job opportunities should be afforded to local individuals as far as possible to enhance their sense of place.
 - Mitigation measures identified by the visual impact assessment should be implemented and maintained.
 - Educational drives within the community highlighting the employment creation, industrial development, and technological energy usage brought about by these plants may assist in this regard.
- Achievability of Mitigation Measures

Most mitigation measures suggested in this report are relatively achievable as they either make use of existing structures or processes without enormous cost to the project proponent.

9 POTENTIAL FOR CHANGE IN THE SIGNICANT OF CUMULATIVE IMPACTS AS ASSESSED IN THE EIA AS A RESULT OF THE REQUESTED AMENDMENT (2022)

9.1 Cumulative impacts on Ecology

The original ecological assessment (Koch 2012) indicates that possible issues of concern for cumulative impacts are dust generation, impacts on ecological movement of species, and emergence of alien species, and "Decommissioning of the plant will result in the elimination of the cumulative impacts mentioned above". The last statement is incorrect; loss of natural habitat is irreversible. This is because secondary vegetation that develops in areas where the soil profile is disturbed do not recover the original species composition. The reasons are ecologically complex and, with rare exceptions, means that any loss of natural habitat is permanent.

The spatial extent of cumulative impacts can be calculated by determining the loss of habitat within the footprint area of the project relative to the extent of similar habitat within an assessed area. The 2018 National Land Cover dataset has land cover data in 73 naturals, degraded and transformed categories. Statistics can be extracted using a GIS algorithm that provides proportions of different land cover classes within 30 km of the current site. Only those classes that occur within the footprint area are of interest to the analysis since it is these classes that are affected by the proposed project.

Other renewable energy projects within 30 km of the current site are as follows:

The exact areas for each of these projects is now known, but an estimate of 2500 ha is made for the total footprint of the combined projects. It is also assumed that similar land cover classes are affected as for the current project. The outcomes of the analysis of possible impacts on spatial extent are as follows:

- 1. Within 30 km of the current project, 96.4% of the landscape (272593 ha) is still in a natural state.
- 2. The loss of habitat predicted to occur due to the current project is 0.07% of the remaining natural habitat within 30 km of the current site. This is negligible.
- 3. A maximum of 0.92% of the remaining natural habitat within 30 km of the current site is potentially affected by all combined projects on the renewable energy database. This total cumulative spatial effect is considered to be small.

The cumulative impact due to the proposed current project is negligible.

9.2 Cumulative impacts on Avifauna

Cumulative effects are commonly understood to be impacts from different projects that combine to result in significant change in an area, which could be larger than the sum of all the individual impacts. The assessment of cumulative effects therefore needs to consider all renewable energy projects within a 30 km radius that have received an EA or are in process at the time of starting the environmental impact process, as well as the proposed Droogfontein SEF. There are currently ten (10) renewable energy projects authorised, operational or in process within a 30 km radius around the proposed Droogfontein PV 3 SEF (excluding those who have been withdrawn, lapsed or refused. The projects were identified using the latest (2022) Renewable Energy EIA Application Database for SA from the Department of Fisheries, Forestry and Environment (DFFE).

Project name	DFFE registration	Status
Proposed Establishment Of A Photovoltaic (Pv) Installation At The Kimberley Airport, Northern Cape Province	12/12/20/2148	Approved
Proposed Kabi Kimberly PV Solar Energy Facility and associated infrastructure on a site East of Kimberly, Northern Cape Province	12/12/20/2124	Approved
South Africa Mainstream Renewable Power Droogfontein	12/12/20/2024/2	Approved
Poposed Construction of a 75 MW Photovoltaic (PV) Plant near Kimberly within the Sol Plaatjie Local Municipality, Northern Cape Province	12/12/20/2024/1/1	Approved
Construction of a CSP and CPV/ PV Plant in, Kimberley, Northern Cape Province	12/12/20/2024	Approved
Proposed construction of 100MW compact linear Fresnel reflector facility on the farm Platfontein 68 and Wildebeestkuil 69 within Sol Plaaitjie Local Municipality, Northern Cape Provice	12/12/20/2251/2	Approved
Amendment for the construction of the 75MW Photovoltaic facility on the farm Platfontein No 68, Northen Cape Province	12/12/20/2251/1	Approved
The Construction Of A 75mw Photovoltaic Solar Facility On A Portion Of Portion 1 Of The Farm Hanskopfontein 40 Rd Near Kimberley, Northern Cape Province	14/12/16/3/3/2/307	Approved
The Proposed Construction Of A 19.5mw Photovoltaic Solar Facility And Its Associated Infrastructure On A Portion Of Portion 24 Of The Farm Zoutpansfontein 34, Registration Division Rd, Northern Cape Province	14/12/16/3/3/1/505	Approved
Solar energy facility on morgenzon farm- phase 2(75mw), Northern Cape Province	14/12/16/3/3/2/257/2	In process

Table 9:	Renewable energy	projects within	30 km of	the current site
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9.3 Cumulative impacts on Heritage

The cumulative impact related to the number of other proposed wind and solar renewable projects in the vicinity of the approved Droogfontein PV were evaluated. It is specialists considered opinion that the cumulative impact on cultural heritage resources, as originally assessed, will not change and is the same as assessed in the original EIA.

9.4 Cumulative impacts on Visual

The previous VIA considered other existing and proposed renewable energy in close proximity to the Droogfontein 3 SEF and according to the DFFE's Renewable Energy EIA Application Database for SA (incremental release Quarter 2 2022), there have been very few EAs granted in respect of new REF developments in the area (Figure 1). There has however been some change in the status of two of the approved projects in the interim. Droogfonetin PV1 and PV2 have been constructed in close proximity to Droogfontien 3 and both of these SEFs are in operation. Hence the landscape has already undergone noticeable change. The development of the Droogfontein 3 SEF directly adjacent to Droogfontein PV2 could therefore be seen an extension of the existing SEF, rather than the creation of a new development in an otherwise "unaltered" landscape.

Accordingly, the overall significance of the cumulative impacts is not expected to increase and these impacts could be mitigated to acceptable levels with the implementation of the relevant mitigation measures.

9.5 Cumulative impacts on Geotech

None

9.6 Cumulative impacts on Agricultural

All renewable energy developments within 30 km of the development being assessed are taken into account in order to assess the cumulative impact.

All of these projects have the same agricultural impacts in an almost identical agricultural environment, and therefore the same mitigation measures apply to all.

In quantifying the cumulative impact, the area of land taken out of grazing as a result of all the developments (total generation capacity of 673 MW) will amount to a total of approximately 1,683 hectares. This is calculated using the industry standards of 2.5 and 0.3 hectares per megawatt for solar and wind energy generation respectively, as per the Department of Environmental Affairs (DEA) Phase 1 Wind and Solar Strategic Environmental Assessment (SEA) (2015). As a proportion of the total area within a 30km radius (approximately 282,700 ha), this amounts to 0.60% of the surface area. That is well within an acceptable limit in terms of loss of low potential

agricultural land which is only suitable for grazing, and of which there is no scarcity in the country. This is particularly so when considered within the context of the following point.

9.7 Cumulative impacts on Social

It is unlikely that the proposed extension to the EA validity will give rise to additional cumulative social impacts or exacerbate the impacts previously identified in the SIA for this development.

9.8 No Go Alternative

The No-Go Alternative is the option of not establishing the PV Plant. The No-Go option would therefore result in contributing to the demand for electricity and more specifically renewable energy targets in South Africa not being met. This would also hinder the economic injection that the project promises to provide for the town of Prieska in the form of short term employment and long term job creation and financial injection.

The No-Go alternative has thus been eliminated due to the fact that the identified environmental impacts can be suitably mitigated and that by not building the project, the socio-economic benefits would be lost.

10 NEED AND DESIRABILITY

10.1 Climate friendly development

The uptake of renewable energy offers the opportunity to address energy needs in an environmentally responsible manner and thereby allows South Africa to contribute towards mitigating climate change through the reduction of GHG emissions. South Africa is estimated to currently be responsible for approximately 1% of global GHG emissions (and circa half of those for which Africa is responsible) and is currently ranked 9th worldwide in terms of per capita carbon dioxide emissions. The proposed development and the associated electricity generated as a result of the facility will result in considerable savings on tons of CO_2 emissions.

10.2 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 (CO₂) and sulphur dioxide (SO₂). Both these gases have been shown to contribute to the worsening climate crisis. Solar 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.

10.3 Employment Creation

The development, procurement, installation, maintenance and management of renewable energy facilities have significant potential for job creation and skills development in South Africa. The construction phase will create temporary employment opportunities and the operation phase will create limited full-time employment opportunities.

11 CUMULATIVE IMPACT ASSESSMENT

Based on the overall assessments of the surrounding environment in relation to the proposed amendment, the specialists did not identify any additional cumulative impacts associated with the proposed amendments.

It was noted that all the original impacts assessments done as part of the EIA process are still applicable due to the fact that there is no change in the baseline environment of the project site. Also, given the nature of the project and the proposed amendment, there are not any new impacts than what was initially identified, as these amendments will take place within the authorised development footprint.

12 CONCLUSION AND MOTIVATION FOR APPROVAL OF THE REQUESTED AMENDMENTS

The specialist verification undertaken as part of the amendment application process have concluded that there are no fatal flaws associated with the proposed amendments being requested by the developer. Based on the specialist findings, it is concluded that the proposed amendments to extend the validity of the EA are not expected to result in an increase to the significance ratings for the identified potential impacts.

The requested amendments include:

An extension of the commencement period (validity) of the Environmental Authorisation by an additional 3 years.

The following mitigation measures have been proposed by the biodiversity specialist to replace those in the original assessment:

- 1. Ensure that impacts during construction and operation are restricted to the project footprint area and do not spread into surrounding natural areas.
- 2. Compile and implement the following management plans, each of which should include appropriate monitoring guidelines:
 - a. Rehabilitation Management Plan.
 - b. Alien Invasive Management Plan.
 - c. Open Space Management Plan.

- d. Plant Rescue/Protection Management Plan.
- e. Black-footed Cat Management Plan (in consultation with EWT).
- 3. Obtain all required protected fauna, protected flora and protected tree permits from the relevant authorities. This will require a detailed pre-construction walk-through survey of the infrastructure footprint area. This is primarily a legal compliance measure and is not necessarily to mitigate any specific impacts.

The following are the key motivating factors which indicate the advantages to granting the requested amendments:

- 1. Impacts identified within the original report are still applicable for the proposed amendments. No additional impacts or change in impact significance will result because of the amendments as the environment has not changed.
- 2. There is no objection to the proposed amendments by any of the specialist consultants who have completed a verification assessment. There is no disadvantage to developing the project on this site considering the results of the site verification assessment, and the request to extend the commencement period should be granted by the Department.
- 3. All the potential cumulative impacts associated with the Droogfontein PV planned within the area (30km radius) can be regarded as Low or positive.
- 4. The Droogfontein PV has the ability to create employment, opportunities for contractors in the surrounding areas, ownership opportunities for local communities, skills, supplier and enterprise development spend and the implementation of socioeconomic development initiatives.
- 5. Green infrastructure makes a contribution to the just energy transition.

Based on the nature of the requested amendments for Droogfontein PV, the specialist findings confirmed that the environment has not materially changed since the undertaking of the original EIA in 2012, and that the impact ratings as provided in the initial assessment remains valid, and that the mitigation measures provided in the initial assessment are still applicable. It can be concluded that the requested amendments will not lead to any additional impacts other than those identified and assessed within the EIA of 2012.

The proposed amendments do not constitute a listed activity and the mitigation measures recommended in the EIA are adequate to manage the expected impacts as a result of the proposed amendments.

Therefore, taking into consideration the conclusions from the specialist site verification and motivation reports and the findings of this report, it is concluded that the proposed amendments are acceptable from an environmental perspective, subject to the implementation of the recommended mitigation measures included in the EIA as well as the Environmental Management Programme (EMPr).

13 PUBLIC PARTICIPATION TO BE FOLLOWED

Public participation is the cornerstone of any Environmental Assessment process. The principles of NEMA as well as the EIA Regulations govern the EIA process, including public participation. The Public Participation Process (PPP) for the proposed development has been conducted according to Chapter 6 of the EIA Regulations of December 2014. These include provision of sufficient and transparent information on an ongoing basis to stakeholders to allow them to comment.

The public participation process is primarily based on two factors; firstly, ongoing interaction with the environmental specialists and the technical teams in order to achieve integration of technical assessment and public participation throughout. Secondly, to obtain the bulk of the issues to be addressed early on in the process, with the latter half of the process designed to provide environmental and technical evaluation of these issues.

The following key public participation tasks have been undertaken:

- » The database/register of I&APs has been updated and maintained.
- » Placement of site notices at the site on **17 October 2022 and 18 October 2022**.
- Written notifications to registered I&APs as well as Organs of State regarding the availability of the Motivation Report were distributed on **18 October 2022**.
- Placement of an advertisement in Volksblad newspaper and Gemsbok Newspaper on 19 October 2022 announcing the availability of the Motivation Report for a 30-day review and comment period.
- The Motivation Report has been made available for the 30-day review and comment period from 18 October to 17 November 2022 on the SiVEST website: https://www.sivest.com/za/renewable-energy/

Comments received during the 30-day review and comment period will be responded to in a comments and response report and included as an appendix in the final submission of the Motivation Report to the DFFE for consideration in the decision-making process. Proof of attempts made to obtain comments from relevant Organs of State and key stakeholders will also be included in the Final Motivation Report.



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