APPENDIX J:

Generic Environmental Management Programme for the On-Site Substation





1.	. INTRODUCTION		3	
	1.1 AUTHORS OF THE EMP	r	4	
	1.2 PROJECT DESCRIPTION	۷	6	
	1.3 STRUCTURE OF THE EI	IPR AND DEFINITION OF STUDY AREA AND SITE	8	
	1.4 ENVIRONMENTAL SENS	SITIVITIES	9	
	1.5 IMPACTS IDENTIFIED D	URING THE EIA PROCESS	10	
2.	. APPROACH TO PREPARING	THE EMPR	13	
	2.1 COMPLIANCE WITH REI	EVANT LEGISLATION	13	
	2.2 CONTENT OF THIS EMP	'R	14	
3.	. ROLES AND RESPONSIBILIT	ES	15	
4.	. SITE SPECIFIC INFORMATION	۷	16	
	4.1 CONTACT DETAILS AND	DESCRIPTION OF THE PROJECT	16	
	4.1.1 Details of the Applicar	.t	16	
	4.1.2 Details and Expertise	of the EAP	16	
	4.1.3 Project Name		16	
	4.1.4 Description of the Proj	ect	16	
	4.1.5 Project Location		1/	
5.	. LAYOUT AND DEVELOPMEN	LAYOUT AND DEVELOPMENT FOOTPRINT SITE MAP1		
6.	. APPLICANT DECLARATION _		17	
7.	. PROJECT SPECIFIC EMPR		18	
	7.1 ALIEN INVASIVE VEGET	ATION MANAGEMENT PLAN	18	
	7.2 TRAFFIC MANAGEMEN	「 PLAN	20	
	7.3 TERRESTRIAL BIODIVE	RSITY	23	
	7.4 AQUATIC BIODIVERSITY	(29	
	7.5 AVIFAUNA		33	
	7.6 VISUAL IMPACTS		35	
	7.7 HERITAGE IMPACTS (AI	CHAEOLOGY AND CULTURAL LANDSCAPE	36	
	7.8 PALAEONTOLOGY		39	
	7.9 GEOTECHNICAL		39	
	7.10 GEOHYDROLOGY		43	
	7 11 SOCIO-ECONOMIC		45	

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

APPENDIX A:	CV OF THE EAP	52
APPENDIX B:	ROLES AND RESPONSIBILITIES	62
APPENDIX C:	CHANCE FOSSIL FIND PROTOCOL FOR PALAEONTOLOGICAL RESOURCES	66
APPENDIX D:	PRE-APPROVED GENERIC EMPR TEMPLATE FOR SUBSTATION INFRASTRUCTURE	
	(GN 435)	67
APPENDIX E:	SENSITIVITY MAP FOR THE STUDY AREA	78
APPENDIX F:	LAYOUT MAP	79
APPENDIX G:	COMBINED LAYOUT AND SENSITIVITY MAP	80



Table 1: Details of the EIA Project Team	
Table 2: Description of the key components of the proposed Solar PV Project	6
Table 3: Farm portions associated with the Kudu Solar Facilities	
Table 4: Impacts identified in the EIA Process	10
Table 5: Mid-point coordinates of the on-site substation complex	17



Figure 1: Locality map of the proposed PV Facilities and associated infrastructure situated north-east of the town De Aar in the Northern Cape Province.

4

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

1. INTRODUCTION

The Project Developer, Kudu Solar Facility 10 (Pty) Ltd (hereafter "Project Applicant" or "Project Developer") is proposing to develop a Solar Photovoltaic (PV) power generation facility and associated Electrical Grid Infrastructure (EGI), north-east of the town of De Aar in the Renosterberg Local Municipality and Pixley Ka Seme District Municipality, in the Northern Cape Province. In total 12 Solar PV Facilities are being proposed (each having a separate Project Applicant). The proposed projects are located approximately 50 km from De Aar and 25 km from Petrusville. The proposed Solar PV Facilities will make use of PV solar technology to generate electricity from energy derived from the sun. Each solar PV Facility will have a range of associated infrastructure, including, but not limited to, an on-site substation complex, Battery Energy Storage System (BESS), and is proposed to connect to the existing Hydra-Perseus 400 kV overhead power line via dedicated proposed 132 kV power lines, an independent Main Transmission Substation (MTS), and a 400 kV Loop-In-Loop-Out (LILO).

Each of the Solar PV Facilities would be its own project and would require its own, separate Environmental Authorisation (EA), Scoping and Environmental Impact Assessment (EIA) Report, and Environmental Management Programme (EMPr). The same applies to the EGI projects, where relevant. The following projects are being proposed:

- <u>PROJECTS 1 TO 12</u>: The proposed development of 12 Solar PV Facilities and associated infrastructure (i.e. Kudu Solar Facility 1 to Kudu Solar Facility 12¹).
- <u>PROJECTS 13 TO 24</u>: The proposed development of switching stations and collector stations at each on-site substation complex at each of the 12 Kudu Solar Facilities, and up to 12 x 132 kV overhead power lines running from each Solar PV Facility to the proposed collector stations or up to the proposed MTS.
- **PROJECT 25**: The proposed development of an independent 400/132 kV MTS, including associated infrastructure at the MTS.
- **PROJECT 26**: The proposed development of a 400 kV LILO from the existing Hydra-Perseus 400 kV overhead power line to the proposed MTS.

Projects 13 to 26 will be undertaken at a later stage; whilst Projects 1 to 12 are the subject of the current Applications for EA.

This EMPr has been prepared as part of the requirements of the 2014 National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) EIA Regulations (as amended). This EMPr covers the proposed Kudu Solar Facility 10 (hereinafter referred to as Kudu Solar Facility or the proposed project) only. Figure 1 shows the overall locality of the proposed project.

¹ Note that throughout the report the term Solar Facility and PV are used synonymously. For example, Kudu Solar Facility 1 and Kudu PV1 are used interchangeably.

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province



Figure 1: Locality map of the proposed PV Facilities and associated infrastructure situated north-east of the town De Aar in the Northern Cape Province.

1.1 AUTHORS OF THE EMPr

This EMPr has been compiled by the Environmental Assessment Practitioners (EAPs) (Paul Lochner and Rohaida Abed), Environmental Scientist (Helen Antonopoulos), and the various specialists on the team (as indicated in Table 1). The details and expertise of the EAPs and project team members are provided in Appendix A of the EIA Report; whilst those of the specialists are provided in Chapters 6 to 19. The Curriculum Vitae of the EAPs is also included in Appendix A of this EMPr.

Paul Lochner has more than 30 years of experience in environmental assessment and management studies, primarily in the leadership and integration functions. This has included Strategic Environmental Assessments (SEA), EIAs and Environmental Management Plans. Paul is a Registered EAP (2019/745) with the Environmental Assessment Practitioners Association of South Africa (EAPASA). Paul has extensive experience in conducting environmental assessment and management processes throughout South Africa.

Rohaida Abed has 13 years of experience in the Environmental Management field and has been involved in Basic Assessments and EIAs relating to renewable energy, port infrastructure and bulk liquid storage facilities; and has also worked on the SEA for Gas Pipeline and EGI Expansion from

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

2017 to 2019. She is a registered Professional Natural Scientist (400247/14) with the South African Council for Natural Scientific Professions (SACNASP), and a Registered EAP (2021/4067) with the EAPASA.

Helen Antonopoulos is an Environmental Scientist in the EMS group of the CSIR and holds BSc, BSc Honours, and MSc degrees in Environmental and Geographical Science from the University of Cape Town. She has assisted with compiling BAs and Scoping and EIAs for Solar Facilities in various provinces.

NAME	ORGANISATION	ROLE/STUDY TO BE UNDERTAKEN	
Environmental Management Services (CSIR)			
Paul Lochner (<i>Registered EAP</i> (2019/745))	CSIR	EAP, Technical Advisor and Quality Assurance	
Rohaida Abed (<i>Pr.Sci.Nat.</i> and <i>Registered EAP</i> (2021/4067))	CSIR	EAP and Project Manager	
Helen Antonopoulos	CSIR	Project Officer	
Sonto Mkize	CSIR	Project Officer	
Phindile Mthembu	CSIR	Project Officer	
Luanita Snyman van der Walt (Pr.Sci.Nat.)	CSIR	GIS Specialist	
Lizande Kellerman (Pr.Sci.Nat.)	CSIR	Public Participation Specialist	
Specialists			
Johann Lanz (<i>Pr.Sci.Nat.)</i>	Private	Agriculture and Soils Compliance Statement	
Corné Niemandt (<i>Pr.Sci.Nat.</i>) Samuel Laurence (<i>Pr.Sci.Nat.</i>) Luke Verburgt	Enviro-Insight cc	Terrestrial Biodiversity, Terrestrial Plant Species, and Terrestrial Animal Species	
Toni Belcher (Pr.Sci.Nat.) Dana Grobler (Pr.Sci.Nat)	Private	Aquatic Biodiversity Impact Assessment	
Chris van Rooyen Albert Froneman (<i>Pr.Sci.Nat.</i>)	Chris van Rooyen Consulting	Avifauna Impact Assessment	
Quinton Lawson (SACAP, 3686) Bernard Oberholzer (SACLAP, 87018)	QARC and BOLA	Visual Impact Assessment	
Dr Jayson Orton (APHP: Member 43; ASAPA CRM Section: Member 233)	ASHA Consulting (Pty) Ltd	Heritage Impact Assessment (Archaeology and Cultural Landscape)	
Dr John Almond (PSSA and APHP Member)	Natura Viva cc	Palaeontology Site Sensitivity Verification Report	
Tony Barbour and Schalk van der Merwe	Private	Socio-Economic Impact Assessment	
Annebet Krige (Pr Eng)	Sturgeon Consulting	Traffic Impact Assessment	
Debbie Mitchell (Pr Eng)	Ishecon cc	Battery Storage High Level Safety, Health and Environment Risk Assessment	
Dale Barrow (<i>Pr.Sci.Nat.</i>) Christel van Staden (<i>Cand.Sci.Nat.</i>) Shane Teek (<i>Cand.Sci.Nat.</i>) Louis Jonk (<i>Pr.Sci.Nat.</i>) Julian Conrad	GEOSS South Africa (PTY) Ltd	Geohydrology Assessment	
Shane Teek (<i>Cand.Sci.Nat.</i>) Dale Barrow (<i>Pr.Sci.Nat.</i>) Hardy Luttig	GEOSS South Africa (PTY) Ltd	Geotechnical Assessment	

Table 1: Details of the EIA Project Team

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

NAME	ORGANISATION	ROLE/STUDY TO BE UNDERTAKEN
Julian Conrad		
Rohaida Abed (<i>Pr.Sci.Nat.</i> and <i>Registered</i> <i>EAP</i> (2021/4067)) Helen Antonopoulos Lizande Kellerman (<i>Pr.Sci.Nat.</i>)	CSIR	Civil Aviation Site Sensitivity Verification
Rohaida Abed (<i>Pr.Sci.Nat.</i> and <i>Registered</i> <i>EAP</i> (2021/4067)) Helen Antonopoulos Lizande Kellerman (<i>Pr.Sci.Nat.</i>)	CSIR	Defence Site Sensitivity Verification

1.2 PROJECT DESCRIPTION

The proposed projects will make use of PV technology to generate electricity from solar energy. Once a Power Purchase Agreement (PPA) is awarded, the proposed facility will generate electricity for a minimum period of 20 years. The construction phase for the proposed project is expected to be up to 12 to 18 months. The components of the proposed project are provided in Table 2 below.

Table 2: Description of the key components of the proposed Solar PV Project

Component	Description	
Solar Field		
Type of Technology	Solar Photovoltaic (PV) Technology	
Generation Capacity (Maximum Installed)	 150 MWac 	
Total developable area that includes all	Buildable Area / Fenced off Area:	
associated infrastructure within the fenced	 120 ha 	
off area of the PV facility		
PV Panel Structure (with the following		
possible tracking and mounting systems):		
Single Axis Tracking structures		
(aligned north-south);		
 Dual Axis Tracking (aligned east-west 	 <u>Height</u>: Approximately 3.5 m (maximum) 	
and north-south);		
 Fixed Tilt Mounting Structure; 		
 Mono-facial Solar Modules; or 		
 Bifacial Solar Modules. 		
Building Infrastructure		
Auxiliary Buildings	• <u>Type</u> : These include, but are not limited to, Operation and	
	Maintenance (O&M) building / centre, site office, workshop,	
	staff lockers, bathrooms/ablutions, warehouses, guard houses,	
	etc.	
	 <u>Cumulative Footprint</u>: Approximately up to 5000 m² 	
	 <u>Height</u>: Up to 10 m 	
Inverter/Transformer Stations	Preliminary average number of stations: 27	
	 <u>Height</u>: Approximately 3 m 	
	 <u>Footprint</u>: Approximately 220 m² each 	
On-site Substation Complex	 Components of the on-site substation complex: 	
	 On-site Independent Power Producer (IPP) or Facility 	
	Substation (~1 ha).	

Component	Description
	 Lithium Ion or Redox Flow Battery Energy Storage System. Refer to the details below. Switching Station and Collector Station (~2 ha). This forms part of Projects 13 – 24 and will be assessed as part of separate processes. This EMPr accordingly does not address the Switching Station and Collector Station. Footprint of the on-site substation complex: Up to approximately 8 ha Height of the on-site substation complex: Up to 10 m Capacity of the on-site substation complex: This varies according to the detailed design and requirements from potential clients, however a capacity stepping up from 22 kV or 33 kV to 132 kV is estimated.
Associated Infrastructure	
Battery Energy Storage System (BESS)	 <u>Technology</u>: Lithium-Ion BESS or Redox Flow BESS (both options have been considered in the Scoping and EIA Process; and both options have been deemed acceptable by the specialists; however the preferred option is Lithium Ion BESS). <u>Footprint</u>: Approximately 1 ha <u>Height</u>: Up to 10 m <u>Capacity</u>: Up to 500 MW / 500 MWh
On-site medium voltage internal cables	 <u>Placement</u>: Underground or above ground in certain sections <u>Capacity</u>: 22 or 33 kV <u>Depth</u>: Maximum depth of 1.5 m
Underground low voltage cables or cable trays	 <u>Depth</u>: Maximum depth of 1.5 m
Access roads (including upgrading and widening of existing roads, where relevant)	Details: Existing roads will be used as far as practically achievable to access the site. The Traffic Specialist has noted that the main roads leading to the proposed project site are of a sufficient width. However, upgrading of the main access point from the R48 will be required. This is specifically at the intersection of the TR38/01 (i.e. R48) and DR3093, which will require an existing island of approximately 60 m ² to be removed and surfaced to accommodate the turning movements of vehicles.
Internal roads	 <u>Details</u>: New internal service roads will need to be established (i.e. new roads within the fenced off area of the PV Facility, and new roads between the closest existing road and the PV Facility to gain access). These would either comprise farm roads (compacted dirt/gravel) or paved roads. <u>Width</u>: Within the PV Facility: Up to 5 m Between the existing road and PV Facility: Up to 8 m
Fencing around the PV Facility Perimeter Storm water channels	 <u>Type</u>: Could be palisade or mesh or fully electrified <u>Height</u>: Up to 3 m Details to be confirmed once the Engineering, Procurement and Construction (EPC) contractor has been selected and the design is finalised. Where necessary, a detailed storm water

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

Component	Description
Panel cleaning and maintenance area	 The type of panels to be used (and panel cleaning) will be confirmed during detailed design/engineering phase. The panel cleaning and maintenance area will form part of the O&M Auxiliary Buildings (located at the on-site substation complex).
Work area during the construction phase	 Temporary Laydown: Up to 7 ha.
(i.e. laydown area)	• The need for a permanent laydown area will be confirmed
	during the detailed design/engineering phase.
Water Requirements	 Approximately 9 000 m³ of water is estimated to be required
	per year for the construction phase.
	 Approximately 1 000 m³ of water is estimated to be required per year for the operational phase.
	per year for the operational phase.
	 water requirements during the decommissioning phase are unknown at this stage.
	 Potential sources: Local municipality, third-party water
	supplier, existing boreholes or drilled boreholes on site.
Construction Period	 12 – 18 months
Operational Period	Once the commercial operation date is achieved, the proposed
	facility will generate electricity for a minimum period of 20
	years.

The proposed project can be divided into the following three main phases:

- Construction Phase;
- Operational Phase; and
- Decommissioning Phase.

Each activity undertaken as part of the above phases may have environmental impacts and, where applicable, has been assessed in the specialist studies (included in Chapters 6 to 19 of this EIA Report). Management and mitigation measures required to address all the impacts are included within this EMPr.

1.3 STRUCTURE OF THE EMPR AND DEFINITION OF STUDY AREA AND SITE

The following EMPrs have been compiled for the proposed project:

- EMPr for the proposed solar facility and all associated infrastructure:
 - \circ $\;$ This EMPr is included as Appendix I of this EIA Report.
 - This EMPr covers all the key project components listed in Table 2 above, <u>except</u> for the on-site substation complex, switching station and collector station. The latter two components will be addressed in separate processes.
- EMPr for the on-site substation complex to be located at the proposed project site (i.e. this EMPr):
 - This EMPr is included as Appendix J of this EIA Report, and it complies with the Generic EMPr published for substation development (Government Gazette 42323,

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

GN 435, dated 22 March 2019). This EMPr covers the On-site Independent Power Producer (IPP) or Facility Substation.

The **study area** for all the proposed Kudu Solar Facilities is the **full extent** of the **eight affected farm properties** on which the proposed PV Facilities are planned to be constructed. These farm properties² are listed in Table 3. The full extent of these properties (i.e. 8 150 hectares (ha)) has been assessed by the specialists to identify environmental sensitivities and no-go areas. Refer to Chapter 2 of the EIA Report for a list of affected farm properties for each proposed solar facility.

Table 3: Farm portions associated with the Kudu Solar Facilities

FARM PORTION	SG CODE
Remaining Extent of the Farm Bas Berg No. 88	C0570000000008800000
Remaining Extent of Portion 3 of the Farm Bas Berg No. 88	C0570000000008800003
Portion 4 (Portion of Portion 3) of the Farm Bas Berg No. 88	C0570000000008800004
Remaining Extent of Portion 2 (Middel Plaats) (a Portion of Portion 1) of the Farm Grasspan No. 40	C0570000000004000002
Remaining Extent of the Farm Annex Wolve Kuil No. 41	C0570000000004100000
Portion 1 (Wolve Kuil West) of the Farm Annex Wolve Kuil No. 41	C0570000000004100001
Portion 2 of the Farm Wolve Kuil No. 43	C0570000000004300002
Remaining Extent of the Farm Wolve Kuilen No. 42	C0570000000004200000

In this EMPr, the following spatial parameters apply to the management actions, unless where specified differently:

- The study area is referred to as the larger assessed area (i.e., 8 150 ha);
- The site as the footprint of the on-site substation complex, which covers an area of up to 8 ha, which includes the on-site IPP or facility substation; BESS and the switching station and collector station.

1.4 ENVIRONMENTAL SENSITIVITIES

Chapters 6 to 19 of the EIA Report provides a detailed description of the environmental features and sensitive areas that were identified and assessed in detail by the specialists for consideration in the layout and location of the proposed project.

Based on the findings of the specialist studies, an environmental sensitivity map has been produced. This map shows the sensitivities on site (e.g., terrestrial, aquatic, avifaunal, visual, agricultural, and heritage features) within the larger assessed area that was identified. Based on this map, the preferred location for the proposed solar facility <u>avoids</u> the sensitive features that were identified by the specialists. Based on the boundaries of the assessed area and the constraints of the environmental sensitivities, a site layout has also been preliminarily determined for this project (Appendix F of this EMPr).

² The farm property details are based on the information captured in the Title Deeds. All references made to these properties in this report should be considered as such.

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

Appendix E of this EMPr includes the environmental sensitivity map for the study area which indicates the environmental sensitive areas and features identified during the EIA Process (as described above). A combined project layout and sensitivity map is included in Appendix G of this EMPr.

1.5 IMPACTS IDENTIFIED DURING THE EIA PROCESS

Based on the specialist studies (as shown in Table 2), the following main <u>direct</u> potential impacts, as indicated in Table 4, were identified and appropriate management and mitigation measures included within the EMPr (where required) to ensure the potential impacts are suitably addressed and managed during all phases of the project. It should be noted that other impacts for which specialist studies were not undertaken but where mitigation or management actions may be required, are also included in the EMPr.

KEY IMPACT	IMPACTS IDENTIFIED
	Negative Impacts
	 Construction Phase Loss of agricultural potential by occupation of land; Loss of agricultural potential by soil degradation; and Loss of agricultural potential by dust generation.
Agriculture	 Decommissioning Phase Loss of agricultural potential by soil degradation; and Loss of agricultural potential by dust generation.
	Positive Impacts
	 Construction, Operational, and Decommissioning Phases Increased financial security for farming operations; and Improved security against stock theft and other crime due to the presence of security infrastructure and security personnel at the energy facility.
	 Construction Phase Potential effect of dust and noise from trucks and construction machinery during the construction period, and the effect of this on nearby farmsteads and visitors to the area. Potential visual effect of haul roads, access roads, stockpiles and construction camps in the visually exposed landscape.
Visual	 Operational Phase Potential visual intrusion of solar arrays and related infrastructure on receptors including glint and glare. Potential visual impact of an industrial type activity on the pastoral / rural character and sense of place of the area.
	 <u>Decommissioning Phase</u> Potential visual effect of any remaining structures, platforms and disused roads on the landscape.

Table 4: Impacts identified in the EIA Process

KEY IMPACT	IMPACTS IDENTIFIED
Heritage and Cultural Landscape	 Construction Phase Potential impacts to archaeology; Potential impacts to graves; and Potential impacts to the cultural landscape. Operational Phase Potential impacts to the cultural landscape. Decommissioning Phase Potential impacts to the cultural landscape.
Palaeontology	The study area has been confirmed as low to very low palaeo-sensitivity. Provided that the Chance Fossil Finds Protocol is incorporated into the EMPrs and fully implemented during the construction phase of the solar PV facility, there are no objections on palaeontological heritage grounds to authorisation of the proposed project. Pending the discovery of significant new fossil finds before or during construction, no further specialist palaeontological studies, reporting, monitoring or mitigation are recommended for the proposed project. The Chance Fossil Finds Protocol has been incorporated into this EMPr (Appendix C). Other standard palaeontology impact management actions for the construction and decommissioning phases are also covered in Section 7.8 of this EMPr.
Terrestrial Biodiversity and Species	 Construction Phase Fragmentation and loss of habitat and sensitive features; Loss of protected species; Introduction and spread of alien invasive species; Increased erosion and soil compaction; and Littering and General Pollution. Operational Phase Increase in alien invasive species; Loss of species composition and diversity; and Littering and General Pollution. Decommissioning Phase Alien invasive species management; and
Aquatic Biodiversity and Species	 Loss of habitat. Construction Phase Disturbance of aquatic habitat and impact on aquatic biota; Removal of indigenous aquatic vegetation and associated loss of aquatic ecological integrity and functionality; Water supply for construction and stress on available water resources; Road crossing structures may impede flow in the aquatic features; Alien vegetation infestation within the aquatic features due to disturbance; and Increased sedimentation and contamination of surface water runoff may result from construction activities. Operational Phase Ongoing disturbance of aquatic features and associated vegetation along access roads or adjacent to the infrastructure that needs to be maintained; Modified runoff characteristics from hardened surfaces has the potential to result in erosion of adjacent watercourses; and Water supply and water quality impacts (e.g. contamination from sewage) as a result of the operation of the proposed Solar Facility and associated infrastructure.

KEY IMPACT	IMPACTS IDENTIFIED
	Decommissioning Phase
	 Increased disturbance of aquatic habitat due to the increased activity; and Increased actimentation and contamination of surface water runoff.
	Construction Phase
	 Displacement due to disturbance associated with the construction of the solar PV plant and associated infrastructure.
Avifauna	 Operational Phase Displacement due to habitat transformation associated with the presence of the solar PV plant and associated infrastructure Collisions with the solar panels Entrapment in perimeter fences Electrocutions in the onsite substation complex Electrocution of priority species on the internal 33kV powerlines. Decommissioning Phase Displacement due to disturbance associated with the decommissioning of the solar PV plant and
	associated infrastructure.
	Negative Impacts Construction Phase Impacts associated with the presence of construction workers on local communities; Impacts related to the potential influx of job seekers; Increased risks to livestock and farming infrastructure associated with the construction related activities and presence of construction workers on the site; Increased risk of grass fires associated with construction related activities; Nuisance impacts, such as noise, dust, and safety, associated with construction related activities and vehicles; and Impact on productive farmland.
Socio-Economic	 Operational Phase Visual impacts and associated impacts on sense of place; Potential impact on property values; and Potential impact on tourism.
	 <u>Decommissioning Phase</u> Social Impacts associated with retrenchment, including loss of jobs and source of income.
	Positive Impacts
	 Construction Phase Creation of employment and business opportunities, and opportunity for skills development and on-site training.
	 Operational Phase Establishment of infrastructure to improve energy security and support renewable sector; Creation of employment opportunities;
	Benefits associated with socio-economic contributions to community development; and
	Benetits for local landowners.
Geohydrology	 Potential lowering of the groundwater level from construction requirements; Potential impact on groundwater quality as a result of accidental oil spillages or fuel leakages.

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

KEY IMPACT	IMPACTS IDENTIFIED
	 Operational Phase Potential lowering of the groundwater level from operational requirements. Potential impact of groundwater quality as a result of using cleaning agents for cleaning the solar panels. Groundwater quality deterioration as a result of electrolyte that will be used for the Battery Energy Storage System (BESS).
	 Decommissioning Phase Potential impact on groundwater quality as a result of accidental oil spillages or fuel leakages. Potential lowering of the groundwater level from decommissioning requirements.
	 <u>Construction Phase</u> Displacement of geologic materials; and Contamination of geologic materials as a consequence of the construction activities.
Geotechnical	 Operational and Decommissioning Phase Increased unnatural hard surfaces; and Contamination of geologic materials as a consequence of typical maintenance and decommissioning activities.
	 Construction Potential congestion and delays on the surrounding road network; Potential impact on traffic safety and increase in accidents with other vehicles or animals; Potential change in the quality of the surface condition of the roads; and Potential noise and dust pollution.
Traffic	 Operational The traffic generated during the operational phase are mainly related to the staff that will be transported to and from the sites and are not anticipated to have a significant traffic impact on the surrounding road network.
	 Decommissioning Phases Potential congestion and delays on the surrounding road network; Potential impact on traffic safety and increase in accidents with other vehicles or animals; Potential change in the quality of the surface condition of the roads; and Potential noise and dust pollution.
BESS	Various risks were identified in terms of safety, health and the environment due to the proposed BESS. Note that this not applicable to the IPP substation.

2. APPROACH TO PREPARING THE EMPr

2.1 COMPLIANCE WITH RELEVANT LEGISLATION

The NEMA requires that an EMPr be submitted where a BA or EIA is being undertaken for an Application for EA. The content of an EMPr must either contain the information set out in Appendix 4 of the 2014 NEMA EIA Regulations (as amended), or must be a generic EMPr relevant to an application as identified and gazetted by the Minister in a government notice. As part of the 2016 EGI SEA, a generic EMPr was also compiled for the development and expansion of (a) overhead electricity transmission and distribution infrastructure; and (b) substation infrastructure for the transmission and distribution of electricity. On 2 March 2018, these two Generic EMPrs were

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

gazetted in Government Gazette 41473, GN 162 and GN 163, for public comment for a period of 45 days. On 22 March 2019, these two Generic EMPrs were gazetted for implementation in Government Gazette 42323, GN 435. This Generic EMPr for substations is relevant to the proposed IPP Substation. This EMPr therefore subscribes to the requirements of the gazetted EMPr (Gazette 42323, GN 435).

Since the Generic EMPr has been gazetted and are applicable to the proposed project, the following has been undertaken:

- Section 1 of Part B of the gazetted Generic EMPr contains a pre-approved template with aspects that are common to the development of substation infrastructure. This section will be completed by the contractor, with each completed page signed and dated by the holder of the EA prior to commencement of the activity. This section will not be submitted to the DFFE as it has already been pre-approved gazetted. To allow I&APs access to the pre-approved EMPr template for consideration, the template was released with the EIA Report for comment (2 June 2023 to 3 July 2023). It is included in Appendix D of this EMPr.
- Section 2 of Part B of the gazetted Generic EMPr has been completed to include site specific information, a preliminary infrastructure layout and development footprint site map, and a declaration that the Applicant will comply with the pre-approved template provided in Part B: Section 1 of the gazetted EMPr. This was submitted to the DFFE for review during the 30-day comment period on the EIA Report (2 June 2023 to 3 July 2023), and has been included in Section 4 (site specific information), Section 5 (preliminary infrastructure layout) and Section 6 (declaration of the Applicant) of this EMPr.
- Part C of the gazetted Generic EMPr has been compiled and included in Section 7 of this EMPr. It includes site specific impact management outcomes and impact management actions that are not included in the pre-approved generic EMPr. It was submitted to the DFFE together with the EIA Report, for consideration during the 30-day comment period (2 June 2023 to 3 July 2023). This section has been prepared by the EAP, with input from relevant specialists. This section of the EMPr is a supplement to the gazetted EMPr and provides site specific mitigation measures identified in the specialist studies. It was confirmed with the DFFE Interpretation Query Unit in February 2020 that if Part C the gazetted Generic EMPr is required, the impact management outcomes and impact management actions must be provided; whilst the columns under the headings, "Implementation" and "Monitoring" can only be completed by the relevant parties after the EA is issued (as per Part B Section 1).

2.2 CONTENT OF THIS EMPR

This Site Specific EMPr includes the following:

- Section 4: Site specific information;
- Section 5: Preliminary infrastructure layout and development footprint site map;
- Section 6: Declaration that the Applicant will comply with the pre-approved template provided in Part B: Section 1 of the gazetted EMPr (which is included in Appendix D of this EMPr);
- Section 7: Site-Specific EMPr as required by Part C of the gazetted EMPr.

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

The Site-Specific EMPr follows the same template as that of Part B – Section 1 of the gazetted EMPr, as recommended. Where applicable, each section of the Site-Specific EMPr is divided into the following four phases of the project cycle:

- Planning and Design Phase;
- Construction Phase;
- Operational Phase; and
- Decommissioning Phase.

The overall goal for environmental management for the proposed project is to plan, design, construct and operate the project in a manner that:

- Minimises the ecological footprint of the project on the local environment;
- Minimises impacts on fauna, flora and freshwater ecosystems;
- Facilitates harmonious co-existence between the project and other land uses in the area;
- Enhances the socio-economic benefits in the local area; and
- Contributes to the environmental baseline and understanding of environmental impacts of electrical grid infrastructure in a South African context.

The EMPr includes the findings and recommendations of the EIA Process and specialist studies. However, the EMPr is considered a "living" document and must be updated with additional information or actions during the design, construction, operational and decommissioning phases if applicable.

3. ROLES AND RESPONSIBILITIES

Since the Generic EMPrs are applicable for the on-site substation complex, it is best to adopt the definitions of the roles and responsibilities as captured in the gazette Generic EMPr of GN 435. This will allow consistency of the management of the project from an environmental perspective and will avoid any contradiction in terms of the roles and responsibilities. The generic roles and responsibilities required for key role players are those of the:

- Project Developer / Developer's Project Manager (DPM);
- Developer Site Supervisor (DSS);
- Environmental Control Officer (ECO);
- Developer's Environmental Officer (DEO);
- Contractor; and
- Contractor's Environmental Officer (CEO).

The definitions of the roles and responsibilities are included in Appendix B of this EMPr. Note that the intent of Appendix B of this EMPr is to give a generic outline of what these roles typically require. It is expected that this will be appropriately defined at a later stage.

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

4. SITE SPECIFIC INFORMATION

4.1 CONTACT DETAILS AND DESCRIPTION OF THE PROJECT

4.1.1 Details of the Applicant

Project: Kudu Solar Facility 10 – EMPr for the On-Site Substation

Name of Applicant	Kudu Solar Facility 10 (Pty) Ltd
Name of Applicant	Du Toit Malherbe
Representative	
Telephone Number:	021 276 3620
Fax Number:	N/A
Postal Address:	Unit B1, Mayfair Square, Century Way, Century City, Cape Town
Physical Address:	Unit B1, Mayfair Square, Century Way, Century City, Cape Town, 7441

4.1.2 Details and Expertise of the EAP

Company of the EAP	Council for Scientific and Industrial Research (CSIR)
Name of EAP	Paul Lochner
Telephone Number:	021 888 2486 or 084 442 3646
Fax Number:	021 888 2693
Email Address:	PLochner@csir.co.za
Expertise of the EAP (Curriculum Vitae included):	 <u>Qualifications:</u> B.Sc. Civil Engineering (awarded with Honours), University of Cape Town M. Phil. Environmental Science, University of Cape Town <u>Experience:</u> Paul has more than 30 years of experience in environmental assessment and management. <u>Professional Registration and Affiliations:</u> Registered EAP (2019/745) with the Environmental Assessment Practitioners Association of South Africa (EAPASA) International Association for Impact Assessment, South African Affiliate. <u>Curriculum Vitae of Paul Lochner is included in Appendix A of this EMPr.</u>

4.1.3 Project Name

	Scoping and Environmental Impact Assessment (EIA) Process for the Proposed					
Project Name	Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and					
	associated infrastructure, near De Aar, Northern Cape Province					

4.1.4 Description of the Project

Refer to Section 1.2 of this EMPr for a detailed description of the proposed project.

4.1.5 Project Location

The on-site substation complex for the proposed project will take place on Portion 1 (Wolve Kuil West) of the Farm Annex Wolve Kuil No. 41.

•	Table 5: N	lid-point	coordinates	of the on-site	substation com	olex
			ooor annates	of the off site	Substation com	JICA

Decima	I degree	Degrees, minutes, seconds			
Latitude (y)	Longitude (x)	Latitude (S)	Longitude (E)		
-30,18926211	24,3614717	30° 11' 21.34360473" S	24° 21' 41.29810776" E		

5. LAYOUT AND DEVELOPMENT FOOTPRINT SITE MAP

This section includes maps of sensitivities, as well as the preliminary infrastructure layout. As noted above, the feature and sensitivity map were prepared based on specialist feedback and existing databases. Individual feature and sensitivity maps are included in the specialist studies (Chapter 6 to 19 of the EIA Report). Refer to Appendix G of this EMPr for the combined sensitivity and layout map for the proposed Kudu Solar Facility.

6. APPLICANT DECLARATION

PROJECT APPLICANT DECLARATION

The proponent/applicant or holder of the EA affirms that he/she will abide and comply with the prescribed impact management outcomes and impact management actions as stipulated in <u>Part B</u>: <u>section 1</u> of the generic EMPr and have the understanding that the impact management outcomes and impact management actions are legally binding. The proponent/applicant or holder of the EA affirms that he/she will provide written notice to the CA 14 days prior to the date on which the activity will commence of commencement of construction to facilitate compliance inspections.

Signature Proponent/Applicant/Holder of EA

Date:

07 July 2023

Kudu Solar Facility 10 (Pty) Ltd

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

7. PROJECT SPECIFIC EMPR

7.1 ALIEN INVASIVE VEGETATION MANAGEMENT PLAN

Impact Management Outcomes: Ensure the appropriate removal of alien invasive vegetation from the proposed project area and minimise the establishment and spread of alien invasive plants due to the project activities. Limit the disturbance of aquatic habitats.

		Implementation			Monitoring		
Imp	act Management Actions	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of
		Person	Implementation	Implementation	Person		Compliance
DE	SIGN PHASE						
•	Compile a method statement that makes use of alien clearing methods as provided by the	To be completed	post EA by relevant	parties.			
	Working for Water Programme and outlined on the Department of Forestry, Fisheries and						
	the Environment (DFFE) website ³ . The method statement should also take into account the						
	relevant legislation under the National Environmental Management: Biodiversity Act (Act						
	10 of 2004) (NEM: BA)).						
CO	NSTRUCTION PHASE						
•	Invasive alien plant growth should be monitored on an ongoing basis within the project site	To be completed	post EA by relevant	parties.			
	and immediate surrounds to ensure that the disturbed areas associated within project						
	activities do not become infested with invasive alien plants.						
•	Implement an ongoing monitoring programme for alien invasive vegetation for the						
	construction phase to detect and quantify any alien invasive species that may become						
	established within the construction site.						
•	Ensure proper management of soil stockpiles. Do not import soil stockpiles from areas with						
	alien plants to ensure proper management of stockpiles.						
•	Undertake rehabilitation of disturbed areas as soon as possible after construction. Stockpile						
	the shallow topsoil layer separately from the subsoil layers. Reinstate the topsoil layers						
	(containing seed and vegetative material) when construction is complete to allow the plants						
	to rapidly re-colonise the bare soil areas.						
•	Keep clearance and disturbance of indigenous vegetation to a minimum.						
-	Ensure that the footprint required for the proposed project activities (such as temporary						
	stockpiling, earthworks, storage areas, site establishment etc.) is clearly demarcated and						
	kept at a minimum.						

³ https://www.dffe.gov.za/projectsprogrammes/wfw/resources#mannuals

Im	Impact Management Outcomes: Ensure the appropriate removal of alien invasive vegetation from the proposed project area and minimise the establishment and spread of alien invasive plants due							
to	he project activities. Avoid establishment and reduce the spread of alien invasive plan	nts due to the project activities. Limit the disturbance of aquatic habitats.						
		Implementation	Implementation			Monitoring		
Im	pact Management Actions	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of	
		Person	Implementation	Implementation	Person	Trequency	Compliance	
•	The removed alien invasive vegetation should be immediately disposed at a suitable waste							
	disposal facility and should not be kept on site for prolonged periods of time, as this will							
	enhance the spread of these species.							
-	All construction machinery and plant equipment delivered to site for use during the							
	construction phase should be cleaned in order to limit the introduction of alien species.							
-	Construction materials brought onto the site should be free of alien plant seed. Sources of							
	alien seed should be prevented from being brought onto the site with imported materials.							
OP	ERATIONAL PHASE	-						
-	Implement an ongoing monitoring programme for alien invasive vegetation for the	To be complete	d post EA by relevant	parties.				
	operational phase to detect and quantify any alien invasive species that may become							
	established within the operational site.							
-	Invasive alien plant growth and signs of erosion should be monitored on an ongoing basis							
	to ensure that the disturbed areas do not become infested with invasive alien plants.							
	Ongoing control of invasive alien plants within the site should be undertaken.							
-	Invasive alien plant material that has been cleared should be removed from the riparian							
	zones and not left on the river banks or burnt within the riparian zone and buffer area.							
-	The removed alien invasive vegetation should be immediately disposed at a suitable waste							
	disposal facility and should not be kept on site for prolonged periods of time, as this will							
	enhance the spread of these species.							
DE	COMMISSIONING PHASE							
•	Implement an ongoing monitoring programme for alien invasive vegetation for the	To be complete	d post EA by relevant	parties.				
	decommissioning phase to detect and quantify any alien invasive species that may become							
	established within the decommissioning site.							
-	Control of invasive alien plants within the site should be undertaken according to the							
	approved method statement.							
-	Mitigation and follow-up monitoring of residual impacts (alien vegetation growth and							
	erosion) may be required.							
-	All natural areas must be rehabilitated with species indigenous to the area. Re-seed with							
	locally sourced seed of indigenous grass species that were recorded on site pre-							
	construction.							

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

7.2 TRAFFIC MANAGEMENT PLAN

Impact Management Outcomes: Manage impact that additional traffic generation will have on road network. Limit the deterioration of the road condition due to construction, operational and decommissioning phase traffic. Limit the release of noise, pollutants and dust emissions.

		Implementation			Monitoring		
Imp	pact Management Actions	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of
		Person	Implementation	Implementation	Person	Frequency	Compliance
DE	SIGN PHASE						
•	If abnormal loads need to be transported by road to the site, a permit will need to be applied	To be completed	post EA by relevant	parties.			
	for in terms of Section 81 of the National Road Traffic Act and authorisation needs to be						
	obtained from the relevant road authorities to modify the road reserve to accommodate						
	turning movements at intersections (if necessary).						
•	It is not anticipated that any widening of the intersection at TR38/01 and DR3093 will be						
	required, however, the existing island will need to be removed (approximately 60 m ²) to						
	accommodate the turning movements of the abnormal load vehicles.						
•	The route to the sites should be further investigated to ensure that abnormal loads are not						
	obstructed at any point by geometric, height and width limitations along the route.						
•	Discussions must be held with the relevant landowners on which the internal access farm						
	road leading to the sites is located, prior to commencement to confirm requirements and						
	details of the agreement.						
•	Ensure that the requirements for use of the internal farm access roads leading to the sites						
	are addressed and considered in the design, as and where applicable.						
•	Provide a Transport Traffic Plan to the Provincial and Municipal Road Department (if						
	required).						
•	A Road Maintenance Plan should be developed for the internal farm access roads (i.e.						
	internal private roads leading off the DR3093) that will be used. The plan should address						
	requirements such as, but not limited to, grading, dust suppressant mechanisms, drainage						
	(where required), signage, and speed limits. The Road Maintenance Plan must ensure						
	regular maintenance of the roads. The Road Maintenance Plan must be communicated						
	with the relevant authorities, where required, and must be provided to the surrounding						
	community forum prior to commencement of construction.						
co	NSTRUCTION PHASE						
•	Plan and stagger delivery trips and schedule deliveries so that they occur outside of peak	To be completed	I post EA by relevant	parties.			
	traffic periods, where possible.						
•	Suitable parking areas should be designated for construction trucks and vehicles at the						
	construction site camp in order to promote order and improve safety.						
•	The use of public transport (buses and/or minibus taxis) to convey construction personnel						
	to the site should be encouraged.						

Impact Management Outcomes: Manage impact that additional traffic generation will have on road network. Limit the deterioration of the road condition due to construction, or decommissioning phase traffic. Limit the release of noise, pollutants and dust emissions.					, operational and		
		Implementation	۱		Monitoring		
Impact Management Actions		Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
•	Staff trips should occur outside of peak hours, where possible. Ensure that the existing island removal at the intersection of TR38/01 and DR3093 is undertaken in an environmental conscious manner, once the relevant authorisations from the road authorities are obtained. Ensure that construction vehicles always remain within a demarcated area at the intersection, and that local road officials are informed of the planned island removal process.						
•	Well maintained vehicles should be used together with well-trained drivers during the construction phase. Vehicle maintenance and driver competency should be monitored. Proof of driver competency as well as the vehicle checks should be verified and undertaken to ensure that vehicles are roadworthy and hence, do not pose a safety risk. The Contractors must ensure that construction vehicles are roadworthy, properly serviced and maintained, and respect the vehicle safety standards implemented by the Project Developer.						
-	To ensure reduced speeds along the roads, implement speed control mechanisms within the construction site by means of a stop and go system, implement speed limits and placement of road signage for the speed limits.						
	Adhere to all speed limits applicable to all roads used.						
-	Road kill monitoring programme (inclusive of wildlife collisions record keeping) should be established.						
•	Implement clear and visible signage indicating movement of vehicles at intersections within the construction site and in the vicinity of the nearby farm steads.						
•	Ensure that there is regular maintenance of the internal farm access roads (i.e. internal private roads leading off the DR3093) that will be used, by the contractor during the construction phase in line with the agreed maintenance plan						
•	Ensure that the upgrading of the internal farm access roads (i.e. internal private roads leading off the DR3093 that are impacted on by the proposed project and will be used), is undertaken to suitable standards as specified by the civil engineer and in accordance with the maintenance plan.						
•	Ensure that the internal farm access roads (i.e. internal private roads leading off the DR3093 that are impacted on by the proposed project and will be used) are restored to its						
	original pre-construction road condition.						
-	Construction activities will have a higher impact than the normal road activity and therefore						
	the internal farm access roads (i.e. internal private roads leading off the DR3093) to site should be inspected on a weekly basis for structural damage.						

	mpact Management Outcomes: Manage impact that additional traffic generation will have on road network. Limit the deterioration of the road condition due to construction, operational and						
ue	commissioning phase tranc. Limit the release of horse, pontiants and dust emissions.	Implementation	2		Monitoring		
Im	aget Management Actions	Bespensible	Mothod of	Timoframe for	Bespensible		Evidence of
Impact Management Actions		Person	Implementation	Implementation	Person	Frequency	Compliance
-	Implement management strategies for dust generation e.g. apply dust suppressant on the	T CISON	Implementation	Implementation	1 013011		Compliance
-	aravel roads on the construction site exposed areas and stockniles. Avoid the use of						
	notable water for dust suppression during the construction phase and consider the use of						
	alternative approved sources, where possible						
	Vehicles must not be overloaded during the construction phase in order to reduce impacts						
	on the road structures, particularly the access roads leading to the site. Random visual						
	inspection of vehicles should be undertaken in order to monitor for overloading. The						
	inspections should also verify if the trucks are covered with appropriate material (such as						
	tarpaulin) if and where possible.						
-	Implement management strategies for dust generation e.g. apply dust suppressant on the						
	gravel roads on the construction site, exposed areas and stockpiles. Avoid the use of						
	potable water for dust suppression during the construction phase and consider the use of						
	alternative approved sources, where possible.						
-	Postpone or reduce dust-generating activities during periods with strong wind. Earthworks						
	may need to be rescheduled or the frequency of application of dust control/suppressant						
	increased.						
-	Avoid using old and unmaintained construction equipment (which generate high sound						
	levels and greater exhaust emissions) and ensure equipment is well maintained.						
OP	ERATIONAL PHASE						
-	Well maintained vehicles should be used together with well-trained drivers during the	To be completed	d post EA by relevant	parties.			
	operational phase, as required. Vehicle maintenance and driver competency should be						
	monitored. Proof of driver competency as well as the vehicle checks should be verified and						
	undertaken to ensure that vehicles are roadworthy and hence, do not pose a safety risk.						
	Vehicles must be roadworthy, visible, adequately marked, properly serviced and						
	maintained, and operated by an appropriately licensed operator.						
-	Adhere to all speed limits applicable to all roads used.						
-	Implement clear and visible signage and signals indicating movement of vehicles at						
	intersections and in the vicinity of the nearby farm steads.						
-	The use of public transport (buses and/or minibus taxis) or carpooling to convey operational						
	personnel to the site should be encouraged.						
-	Limit access to the site to personnel.						
•	The main access roads to site should be inspected on a weekly basis for structural damage.						

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

Im	Impact Management Outcomes: Manage impact that additional traffic generation will have on road network. Limit the deterioration of the road condition due to construction, operational and						
de	ecommissioning phase traffic. Limit the release of noise, pollutants and dust emissions.						
		Implementation	1		Monitoring		
Im	pact Management Actions	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of
		Person	Implementation	Implementation	Person	Frequency	Compliance
-	Ensure that there is regular maintenance of the internal farm access roads (i.e. internal						
	private roads leading off the DR3093) that will be used, by the operator during the						
	operational phase in line with the agreed maintenance plan.						
•	Implement management strategies for dust generation e.g. apply dust suppressant on						
	gravel roads on the operational site, exposed areas and stockpiles.						
•	Vehicles must not be overloaded during the operational phase (where applicable) in order						
	to reduce impacts on the road structures. Random visual inspection of vehicles should be						
	undertaken in order to monitor for overloading (where applicable).						
DE	COMMISSIONING PHASE						
•	Ensure that the traffic mitigation and management measures are adhered to during the	To be completed	d post EA by relevant	parties.			
	decommissioning phase.						

7.3 TERRESTRIAL BIODIVERSITY

	Impact Management Actions		Implementation			Monitoring		
Im			Method of	Timeframe for	Responsible	Fraguanay	Evidence of	
			Implementation	Implementation	Person	Frequency	Compliance	
DE	SIGN PHASE							
•	Provide critter paths through the fence line to allow species access to site and in order to							
	escape.							
•	Ensure that the live electrical fence wire is not placed at ground level.							
•	Reduce direct mortalities by allowing for fauna to cross the roads. Where applicable, this	To be completed	post EA by relevant	parties.				
	can be achieved by constructing fauna underpasses under the roads (large culverts or large							
	open-ended concrete pipes laid into the raised roads). These underpasses should be used							
	in conjunction with "fauna barriers" which prevent the most susceptible small fauna from							

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

		Implementation			Monitoring			
Imp	act Management Actions	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of	
		Person	Implementation	Implementation	Person		Compliance	
	crossing the roads on the surface by directing them towards the underpasses where they							
	can cross under the roads safely. It is important to note that utilization of underpasses is							
	strongly dependent on animal body size (larger culverts are more successful) and the							
	surrounding habitat.							
•	Reduce exterior lighting to that necessary for safe operation and implement operational							
	strategies to reduce spill light. Use down-lighting from non-UV lights* where possible, as							
	light emitted at one wavelength has a low level of attraction to insects. This will reduce the							
	likelihood of attracting insects and their predators. Insects generally see 3 colours of light,							
	Ultraviolet (UV), blue and green. Bright white or bluish lights (mercury vapor, white							
	incandescent and white florescent) are the most attractive to insects. Yellowish, pinkish, or							
	orange (sodium vapor, halogen, dichroic yellow) are the least attractive to most insects.							
•	Ensure the necessary permits or licenses are identified and applied for as applicable for							
	removal of indigenous vegetation, especially for protected species. Provincially protected							
	species must be avoided during the construction activities where it will be impacted on by							
	construction activities. Alternatively, permits for the rescue i.e. removal and translocation							
	or destruction, where relevant, of any of these protected species must be applied for and							
	granted by the provincial authority.							
-	Await response and provision of permit (as required) from the relevant Authorities prior to							
	the removal of the indigenous species (if required). Once these permits are obtained,							
	search and rescue must be undertaken for the relevant indigenous species prior to the							
	commencement of construction activities.							
-	Ensure that the footprint required for the proposed project activities is kept at a minimum.							
CO	NSTRUCTION PHASE							
-	Sensitive habitats and areas outside of the project development area should be clearly	To be completed	post EA by relevant	parties.				
	demarcated as no go areas during the construction phase to avoid accidental impacts.							
-	Vegetation clearing close to the watercourse should be minimised and where necessary,							
	appropriate storm water management should be put in place to limit erosion potential of							
	exposed soil, such as placing sedimentation trapping to prevent exposed soils from spilling							
	into the watercourse (if necessary).							

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

		Implementation			Monitoring			
Imp	act Management Actions	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of	
		Person	Implementation	Implementation	Person		Compliance	
•	The watercourse and its buffer areas should be demarcated and fenced off prior to							
	construction to exclude the watercourse from development activities.							
•	Workers should not be allowed outside the demarcated construction areas or camps or							
	beyond the boundaries of the solar PV facility itself, i.e. they will not be allowed to wander							
	across the undeveloped parts of each site. No development or activities should take place							
	in the high sensitivity areas.							
•	Buffer zones are allocated to sensitive or important habitat features to alleviate the effect							
	of habitat loss, habitat fragmentation, disturbances, increased isolation and edge effects.							
	No development should take place within High sensitivity areas or buffer zones.							
	Accordingly, the Koppies habitat (where relevant) should be avoided.							
•	No construction related activities, such as the site camp, storage of materials, temporary							
	roads or ablution facilities may be located in the high sensitivity areas.							
•	Minimise loss of natural vegetation.							
•	Only clear areas designated for development.							
•	The proposed project footprint must be demarcated to reduce unnecessary disturbance							
	beyond the proposed project area.							
•	Unnecessary impacts on surrounding natural vegetation must be avoided during							
	construction. No construction vehicles should be allowed to drive around the veld. All							
	construction vehicles should strictly remain on properly demarcated roads.							
•	Undertake re-vegetation and rehabilitation of disturbed areas as soon as possible after							
	construction. Stockpile the shallow topsoil layer separately from the subsoil layers.							
	Reinstate the topsoil layers (containing seed and vegetative material) when construction is							
	complete to allow the plants to rapidly re-colonise the bare soil areas. Re-seed with locally-							
	sourced seed of indigenous grass species that were recorded on site during the pre-							
	construction phase.							
•	The collection, hunting or harvesting of any plants (or 'veldkos'), fuel wood or animals at							
	the site during construction should be strictly forbidden and the staff should be educated to							
	prevent this from happening.							
•	Indigenous vegetation must not be removed or damaged.							

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

		Implementation	1		Monitoring			
Imp	act Management Actions	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance	
•	Fires should only be allowed within fire-safe demarcated areas. Open fires must be							
	prohibited. Appropriate fire safety training should also be provided to staff that are to be on							
	site for the duration of the construction phase.							
•	A plant rescue operation must be initiated to confirm that no SSC are located within the							
	development footprint.							
•	Should any of the listed / protected species need to be removed, the requisite provincial							
	and/or national permits must be obtained prior to the removal of the species.							
•	Establish a recording method in order to monitor the construction activities, including							
	species presence within site, mortalities and observations.							
•	All staff should be subjected to an induction training program where appropriate							
	conservation principles, safety procedures, snake bite avoidance and first aid treatment are							
	taught. Several staff members should complete a snake handling course to safely remove							
	snakes from construction areas.							
•	All staff operating motor vehicles must undergo an environmental induction training course							
	that includes instruction on the need to comply with speed limits, to respect all forms of							
	wildlife (especially reptiles and amphibians) and, wherever possible, prevent accidental							
	road kills of fauna. Drivers not complying with speed limits should be subject to penalties.							
•	Excavated trenches must be left open for as short a time as possible to avoid acting as							
_	dispersal barriers of traps.							
•	All open excavated trenches must have escape points with an angle of less than 45° to							
-	allow for trapped animals to escape.							
-	(broading migration feeding) of animals. Do not unprecessarily disturb found species							
	(breeding, migration, reeding) or animals. Do not unnecessarily disturb radial species,							
	The site camp must not be located in high sensitivity areas and their huffer zones							
	Ablution facilities must be located outside sensitive areas and their buffer zones							
-	Dangerous goods may not be stored within 100 m of a watercourse							
	Portable ablution facilities must be regularly cleaned and maintained in good working							
	condition.							
		1						

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

		Implementation			Monitoring		
Imp	act Management Actions	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of
		Person	Implementation	Implementation	Person		Compliance
•	Any spillage from ablution facilities must be cleaned up immediately and disposed of in an						
	appropriate manner.						
•	Hydrocarbon fuels must be stored in a secure, bunded area.						
•	Vehicles must be in good working condition, with no oil, water, or fuel leaks. Vehicles must						
	be regularly inspected, and any problems corrected.						
•	Refuelling may only take place in an appropriate, bunded area. Refuelling may not take						
	place in sensitive areas.						
•	Hydrocarbon spills must be contained and cleaned up immediately. Spill kits must be						
	available on site in case of accidental spillage.						
•	Utilise existing access routes as far as possible.						
•	Confine the movement of vehicles to the access routes to and from the site and to the						
	construction areas.						
•	Do not drive in the natural veld.						
•	Rehabilitate new vehicle tracks and areas where the soil has been compacted as soon as						
	possible.						
•	Monitor the entire site for signs of erosion.						
•	Refer to the Aquatic Biodiversity Specialist Assessment Report for mitigation measures						
	relevant to watercourse crossings and development close to watercourses.						
•	All vehicle speeds associated with the project should be monitored and should be limited						
	to 40 km/h (maximum) during the construction phase.						
•	Conduct inspections of the fence line to address any animals that may be affected by the						
	fence, i.e. stuck or casualties.						
•	A roadkill monitoring programme (inclusive of wildlife collisions record keeping) should be						
	established. Where needed, Animex fences must be installed to direct animals to safe road						
	crossings. Finally, mitigation should be adaptable to the onsite situation which may vary						
	over time.						
•	Re-vegetation of disturbed surfaces must occur immediately after construction activities are						
	completed. Allow natural vegetation recruitment from the topsoil unless the vegetation						
	cover is insufficient. Re-seed with locally-sourced seed of indigenous grass species that						

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

			Implementation			Monitoring		
Imp	act Management Actions	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance	
	were recorded on site pre-construction or by using a commercial seed mix indigenous to							
	the area.							
OP	ERATIONAL PHASE							
•	Monitor rehabilitation efforts post-construction phase.	To be completed	post EA by relevant	parties.				
-	Avoidance of damage to infrastructure by faunal activity as well as impact on fauna as a							
	result of the site infrastructure.							
•	Identify impact of burrowing and other faunal activities on the fence line and operations							
	activities.							
•	Undertake the management of faunal intrusion through the fence, including possible							
	mortalities.							
-	Conduct inspections of the fence line to address any animals that may be affected by the							
	fence, i.e. stuck or casualties.							
-	The operational personnel and staff should be made aware of the presence of fauna within							
	the proposed project area.							
•	Driving is not allowed at night, where possible.							
•	Vehicles must be in good working condition, with no oil, water, or fuel leaks.							
•	Vehicles must be regularly inspected, and any problems corrected.							
•	Refuelling may only take place in an appropriate, designated bunded area.							
-	Any spillages must be reported immediately and dealt with appropriately.							
•	Spill kits must be available on site in case of accidental spillage.							
DE	COMMISSIONING PHASE							
•	The loss of vegetation is unavoidable within the approved layout development footprint, but	To be completed	post EA by relevant	parties.				
	sensitive areas must be avoided.							
•	Implement appropriate rehabilitation measures to restore each habitat to a natural state							
	after decommissioning.							
-	The effort must benefit the potential faunal species that may find refuge on the site.							
-	All natural areas must be rehabilitated with species indigenous to the area. Re-seed with							
	locally-sourced seed of indigenous grass species that were recorded on site pre-							
	construction.							

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

Impact Management Outcomes: To reduce the loss of and impact on fauna. Ensure compliance with relevant Provincial and National legislation in respect of habitat and species permits. Allow for ecological succession and animal re-colonisation. Reduced loss of natural vegetation and veld degradation within the development footprint and the surrounding area. Minimise impacts on protected species. Reduce the amount of littering and pollution within and around the construction and operational site. Reduced erosion and soil compaction caused by construction activities. To reduce incidental mortality and injury of fauna within the construction area. Rehabilitation post-construction by replacing topsoil and re-seeding. To reduce the impact and loss of fauna from site as a result of their exclusion from the area due to fencing. The avoidance of electrical light pollution through prudent positioning of external lighting. Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to construction.

In Irr Impact Management Actions R P		Implementation			Monitoring		
		Responsible	Method of	Timeframe for	Responsible	Fraguanay	Evidence of
		Person	Implementation	Implementation	Person	Frequency	Compliance
-	Rehabilitation must be executed in such a manner that surface run-off will not cause erosion						
	of disturbed areas.						

7.4 AQUATIC BIODIVERSITY

Impact Management Outcomes: Limit the disturbance of aquatic habitats. Minimise potential to modify flow/hydraulics-related impacts and increase the potential for erosion. Limit the potential for contamination/pollution of aquatic ecosystems. Implementation Monitoring Impact Management Actions Responsible Responsible Method of Timeframe for Evidence of Frequency Person Implementation Implementation Person Compliance **DESIGN PHASE** Ensure the final layout avoids watercourses and recommended buffers as far as possible; utilisation should be made of existing disturbed areas where possible. The mediumsensitivity aquatic habitats should be avoided in the layout design, with only low-sensitivity habitats being disturbed during construction. Note that this has been achieved in the EIA Phase, whereby the recommended development setbacks (i.e. recommended setback from the wider floodplain adjacent to the larger rivers) have been adopted in the identification of the development footprints. The recommended avoidance areas have been avoided. Some access roads do cross water courses for the entire project, which would be To be completed post EA by relevant parties. acceptable provided the recommended mitigation is implemented. For road crossings, the sensitivities are not regarded as no-go. Construction sites and laydown areas should be located within the assessed buildable areas/development footprints. A comprehensive stormwater management plan should be compiled for the compacted surfaces within the site by the project engineer with input from the freshwater specialist. The plan should aim to reduce the intensity of runoff from the developed area, particularly on the steeper slopes and reduce the intensity of the discharge into the adjacent drainage

Im	pact Management Outcomes: Limit the disturbance of aquatic habitats. Minimise potential to modify flow/hydraulics-related impacts and increase the potential for erosion. Limit the potential for ontamination/pollution of aquatic ecosystems.									
		Implementation	1		Monitoring					
Im	pact Management Actions	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance			
	lines. Where necessary measures to dissipate flow intensity or protect erosion should be included in the plan. The plan should encourage infiltration rather than runoff and should prevent the impedance of surface or sub-surface flows. The plan should also mitigate any contaminated runoff from the construction and operation activities from being discharged into any of the aquatic features within the site. Stormwater run-off infrastructure must be designed to mitigate both the flow and water quality impacts of any stormwater leaving the developed areas. The runoff should rather be dissipated over a broad area covered by natural vegetation or managed using appropriate shaping of the road with berms or channels and swales adjacent to hardened surfaces where necessary. Should any erosion features develop, they should be stabilised immediately. Adequate erosion mitigation measures should be incorporated into designs. Use existing crossings, as best as possible and where allowable. The existing road infrastructure to minimise the overall disturbance. It is recommended that any new linear type of infrastructure crossings over watercourses be placed where there are existing structures or road crossings within the watercourses. The structure should not impede or concentrate the flow in the watercourse, and should prevent blockages and erosion. It is		mpiementation	mpiementation	rerson		Compliance			
	with the construction works within the aquatic features should be removed once construction is complete.									
-	A sustainable water supply should be sought. Water consumption requirements for the construction and operation of the proposed project if not obtained from an authorised water user within the area, must be authorised by the Department of Water and Sanitation (DWS)									
-	No liquid waste should be discharged into any of the aquatic features within the site without the approval of the DWS. Wastewater should be properly contained on-site and removed to a licensed wastewater treatment facility that can treat the wastewater.									
CC	DNSTRUCTION PHASE									
•	Avoid disturbing aquatic habitats as far as possible. Minimise works within aquatic ecosystems as far as possible. For all project-related components within the site, the aquatic features of medium sensitivity	To be completed	d post EA by relevant	parties.						
	should be treated as no-go areas during the construction phase.									

Im	pact Management Outcomes: Limit the disturbance of aquatic habitats. Minimise poten	tial to modify flo	w/hydraulics-related	d impacts and increa	ase the potential	for erosion. Limi	it the potential for
COI	tramination/poliution of aquatic ecosystems.	Implementation)		Monitoring		
lmj	pact Management Actions	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
	Any activities that require construction within the delineated aquatic features and the recommended buffers should be described in method statements that are approved by the Environmental Control Officer (ECO). Rehabilitation of any disturbed areas within the aquatic features and the recommended buffer areas should be undertaken immediately following completion of the disturbance activity according to rehabilitation measures as included in a method statement for that specific activity as described above. Any works within aquatic features should be undertaken in the dry season where possible. Sediment traps should be used where necessary. Ablution facilities should not be placed within 100m of any of the aquatic features delineated within the site; Liquid dispensing receptacles (e.g. lubricants, diesel, shutter oil etc.) must have drip trays beneath them/beneath the nozzle fixtures. Material safety data sheets (MSDS) must be available on site (if required) where products are stored so that in the event of an incident, the correct action can be taken. Depending on the types of materials stored on site during the construction activities, suitable product recovery materials must be readily available. Vehicles should ideally be washed at their storage yard as opposed to on site. Clearing of indigenous vegetation should not take place within the aquatic features and the recommended buffers. Rehabilitate disturbed aquatic habitats once construction works are complete by revegetating them with suitable local indigenous vegetation. Water use for construction should be minimised as much as possible. The water should be obtained from an existing water allocation or other viable water sources for construction purposes.						
•	Manage stormwater impacts.						
	Organize manifering of the read crossing structures in particular before the reinfell period		d post EA by roley opt	parties			
-	should be undertaken to ensure that the integrity of the structures is integrit and that they are		a post EA by relevant	parties.			
	not blocked with sediment or debris. Ongoing monitoring post large rainfall events should						
	also be undertaken to identify and address any erosion occurring within the watercourses.						

Impact Management Outcomes: Limit the disturbance of aquatic habitats. Minimise p	potential to modify flo	w/hydraulics-related	l impacts and increa	ase the potential	for erosion. Lim	it the potential for
	Implementatio	n		Monitoring		
Impact Management Actions	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
 Sewage generated within the site should be discharged to a conservancy tank the properly serviced and regularly evacuated to nearby wastewater treatment works. agreement should be entered into between the Applicant and the Water Services Auth in the area, for the clearing and disposal of sewer sludge accumulated from conservancy tanks into an authorized Wastewater Treatment Works. A letter should submitted to the Department of Human Settlements, Water and Sanitation Northern C Region, Lower Orange Water Management Area office to indicate the capacity of conservancy tanks, once confirmed. The conservancy tanks must be designed professional engineers. Limit disturbance and rehabilitate disturbed areas. Ensure there is sufficient stormwater management to prevent erosion of watercourses Limit and monitor water use. 	at is . An pority the d be Cape f the d by s.					
DECOMMISSIONING PHASE						
 For all project-related components within the site, the aquatic features of medium sensitis should be demarcated by the appointed ECO before the commencement of decommissioning activities and treated as no-go areas during the decommissioning ph Minimise works within aquatic ecosystems. If the project layout avoided these areas, decommissioning works would also be able to avoid aquatic habitats as delineated. It that all aquatic areas recommended for avoidance have been avoided in the EIA ph layout identification. Any activities that require decommissioning activities within the delineated aquatic feat and the recommended buffers should be described in method statements that are approby the ECO. Rehabilitate and revegetate disturbed areas, where required. Rehabilitation of any disturbed areas within the aquatic features and the recommer buffer areas should be undertaken immediately following the completion of the disturbation specific activity. The road network should be returned to that resembling pre-construction, with all additi roads removed where possible. Decommissioning activities within aquatic features should be undertaken in the dry searches. 	tivity To be complete the nase. , the Note hase oved ance that ional ason	d post EA by relevant	parties.			
 where possible. Sediment traps should be used where necessary. Laydown areas should be placed within the approved PV footprint and layout. 						

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

Imp	npact Management Outcomes: Limit the disturbance of aquatic habitats. Minimise potential to modify flow/hydraulics-related impacts and increase the potential for erosion. Limit the potential for								
con	ontamination/pollution of aquatic ecosystems.								
		Implementation			Monitoring				
Imp	Impact Management Actions		Method of	Timeframe for	Responsible	Frequency	Evidence of		
			Implementation	Implementation	Person	Frequency	Compliance		
•	Good housekeeping measures should be implemented as per the project EMPr and								
	monitored by the appointed ECO. This should specifically address on-site stormwater								
	management and prevention of pollution during decommissioning. Any stormwater that								
	does arise within the decommissioning site must be handled appropriately to trap								
	sediments and pollutants.								

7.5 AVIFAUNA

Impact Management Outcomes: Prevent mortality of avifauna. Prevent displacement of avifauna. Prevention of electrocution mortality. Prevent unnecessary displacement of avifauna by ensuring that contractors are aware of the requirements of the Construction Environmental Management Programme (CEMPr). Prevent unnecessary displacement of avifauna by ensuring that the rehabilitation of transformed areas is implemented by an appropriately qualified rehabilitation specialist, according to the recommendations of the botanical specialist study. Prevention of electrocution mortality. Prevent unnecessary displacement of avifauna by ensuring that contractors are aware of the requirements of the Decommissioning EMPr.

			Implementation			Monitoring			
Imp	pact Management Actions	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of		
		Person	Implementation	Implementation	Person	riequency	Compliance		
DE	SIGN PHASE								
•	A single perimeter fence should be used ⁴ .								
•	A 1 km all infrastructure exclusion zone around the Verreaux's Eagle nest at -30.227660°								
	24.329773° must be implemented to provide unhindered access to the nest (Refer to the	To be completed post EA by relevant parties.							
	sensitivity maps provided in the Avifauna Specialist Assessment Report).								
•	Design the facility with underground cables as much as possible.								
СО	NSTRUCTION PHASE								
•	A site-specific CEMPr must be implemented, which gives an appropriate and detailed	To be completed	post EA by relevant	parties.					
	description of how construction activities must be conducted. All contractors are to adhere								
	to the CEMPr and should apply good environmental practice during construction. The								
	CEMPr must specifically include the following:								
	 No off-road driving; 								
	o Maximum use of existing roads, where possible and the construction of new								
	roads should be kept to a minimum as far as practical;								

⁴ If a fence is used consisting of an outer diamond mesh fence and inner electric fence with a separation distance of approximately 100 mm or less, it should not pose any risk of entrapment for large terrestrial species and can be considered a single fence.

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

Impact Management Outcomes: Prevent mortality of avifauna. Prevent displacement of avifauna. Prevention of electrocution mortality. Prevent unnecessary displacement of avifauna by ensuring that contractors are aware of the requirements of the Construction Environmental Management Programme (CEMPr). Prevent unnecessary displacement of avifauna by ensuring that the rehabilitation of transformed areas is implemented by an appropriately qualified rehabilitation specialist, according to the recommendations of the botanical specialist study. Prevention of electrocution mortality. Prevent unnecessary displacement of avifauna by ensuring that contractors are aware of the requirements of the Decommissioning EMPr.

Impact Management Actions			Implementation			Monitoring		
			Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance	
	 Measures to control noise and dust according to latest best practice; Restricted access to the rest of the property, the activity should as far as possible be restricted to the development footprint; Strict application of all recommendations in the ecological and botanical specialist studies, especially pertaining to the limitation of the footprint. 			- -				
OP	ERATIONAL PHASE							
•	The recommendations of the botanical specialist must be strictly implemented, especially as far as limiting the vegetation clearance to what is absolutely necessary, and rehabilitation of transformed areas are concerned. Develop a Habitat Restoration Plan (HRP). Monitor rehabilitation via site audits and site inspections to ensure compliance. Record and report any non-compliance. It is recommended that if on-going impacts are recorded as part of routine inspections once operational, site-specific mitigation (insulation) be applied reactively. This is an acceptable approach because Red List priority species are unlikely to frequent the substation and be electrocuted.	To be completed post EA by relevant parties.						
DECOMMISSIONING PHASE								
•	 A site-specific Decommissioning EMPr (DEMPr) must be implemented, which gives appropriate and detailed description of how construction activities must be conducted. All contractors are to adhere to the DEMPr and should apply good environmental practice during decommissioning. The DEMPr must specifically include the following: No off-road driving; Maximum use of existing roads during the decommissioning phase and the construction of new roads should be kept to a minimum as far as practical; Measures to control noise and dust according to latest best practice; Restricted access to the rest of the property, the activity should as far as possible be restricted to the development footprint; Strict application of all recommendations in the ecological and botanical specialist studies, especially as far as limitation of the activity footprint is concerned. 	To be completed	l post EA by relevant	parties.				

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

7.6 VISUAL IMPACTS

Impact Management Outcomes: Minimise exposure of visual receptors to visual impacts. To minimise visual impacts on the exposed landscape, nearby farmsteads and visitors to the area. To reduce the visual intrusion of the operation infrastructure on the surrounding landscape and receptors. Minimise exposure of visual receptors to impacts associated with decommissioning. Implementation Monitoring Impact Management Actions Responsible Method of Timeframe for Responsible Evidence of Frequency Person Implementation Implementation Person Compliance DESIGN DUASE

•	Review s	signed off designs to ensure that:						
	0	The substation is located in an unobtrusive low-lying area, away from public						
		roads, where possible.						
	0	Muted natural colours and non-reflective finishes are used for structures						
		generally.	To be completed post EA by relevant parties					
	0	Internal access roads are designed to be as narrow as possible, and existing	To be completed post EX by relevant parties.					
		roads or tracks used as far as possible.						
	0	Outdoor/security lighting to be fitted with reflectors to obscure the light source,						
		and minimise light spillage.						
	0	Outdoor signage to be discrete and commercial / billboard signage avoided.						
CONSTRUCTION PHASE								
•	Ensure t	hat visual management measures are included as part of the EMPr and monitored	To be completed post EA by relevant parties.					
	by an EC	20.						
•	Ensure of	construction camps, stockpiles, temporary laydown areas and batching plants are						
	located i	n visually unobtrusive areas, away from public roads and outside of identified no-						
	go areas	unless otherwise approved by the visual specialists.						
•	Impleme	ntation of dust suppression and litter control measures.						
•	Rehabilit	ation efforts to commence immediately after construction activities are completed.						
OPERATIONAL PHASE								
•	Ensure t	hat visual mitigation measures are monitored by management on an on-going	To be completed post EA by relevant parties.					
	basis, in	cluding the maintenance of rehabilitated areas, as well as control of any signage,						
	lighting a	and waste at the proposed project, with interim inspections by the responsible						
	Environn	nental Officer or Manager						
DECOMMISSIONING PHASE								
•	Ensure	that procedures for the removal of structures during decommissioning are	To be completed post EA by relevant parties.					
	impleme	nted, including recycling of materials and rehabilitation of the site to a visually						
	acceptat	le standard, and signed off by the delegated authority.						
•	It is assu	med that some access roads and concrete pads would remain. Those that are not						
	required	should be ripped and regraded, and vegetation or cropland reinstated to match						
	the surro	undings.						
ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

Impact Management Outcomes: Minimise exposure of visual receptors to visual impacts. T	o minimise visua	l impacts on the exp	osed landscape, ne	arby farmsteads a	and visitors to the	e area. To reduce		
he visual intrusion of the operation infrastructure on the surrounding landscape and receptors. Minimise exposure of visual receptors to impacts associated with decommissioning.								
	Implementation		Monitoring	itoring				
Impact Management Actions	Responsible	Method of	Timeframe for	Responsible	Fraguanay	Evidence of		
	Person	Implementation	Implementation	Person	Frequency	Compliance		
 Exposed or disturbed areas to be revegetated to blend with the surroundings. 								

7.7 HERITAGE IMPACTS (ARCHAEOLOGY AND CULTURAL LANDSCAPE

Impact Management Outcomes: Avoid impacts (preferred) or locate and sample or rescue sites/burials before disturbance. Rescue information, artefacts or burials before extensive damage occurs. Minimise landscape scarring. Minimise intrusion into the cultural landscape. Minimise contrast and light pollution.

Impact Management ActionsResponsible PersonMethod of ImplementationTimeframe for ImplementationResponsible PersonFrequencyEvidence of ComplianceCONSTRUCTION PHASE• Reporting chance finds of graves and dense clusters of artefacts as early as possible to an archaeologist and/or the South African Heritage Resources Agency (SAHRA) (https://www.sahra.org.za/contact/), protect in situ and stop work in immediate area and appoint archaeologist to exhume or sample as needed (where relevant).To be completed post EA by relevant parties.To be completed post EA by relevant parties.Vertex is the second s		Implementation			Monitoring			
CONSTRUCTION PHASE Reporting chance finds of graves and dense clusters of artefacts as early as possible to an archaeologist and/or the South African Heritage Resources Agency (SAHRA) (https://www.sahra.org.za/contact/), protect in situ and stop work in immediate area and appoint archaeologist to exhume or sample as needed (where relevant). In terms of Section 38 (4) (c) (i) of the National Heritage Resources Act (Act 25 of 1999) (NHRA), if any evidence of archaeological itses or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, the SAHRA Development Applications Unit (DAU) (Natasha Higgitt 021 202 8660/ nhiggitt@sahra.org.za) must be alerted as per Section 51(1)e of the NHRA and item 5 of the Schedule. In terms of Section 38 (4) (c) (ii) of the NHRA. Non-compliance with this section of the NHRA is an offense in terms of Section 51(1)e of the NHRA. Non-compliance with this section of the NHRA is an offense in terms of Section 51(1)e of the NHRA. Non-compliance with this section of the NHRA is an offense in terms of Section 51(1)e of the NHRA and item 5 of the Schedule. In terms of Section 38 (4) (c) (ii) with regards to the appointment of specialists, if heritage resources are uncovered during the course of the development, a professional	Impact Management Actions	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance	
 Reporting chance finds of graves and dense clusters of artefacts as early as possible to an archaeologist and/or the South African Heritage Resources Agency (SAHRA) (https://www.sahra.org.za/contact/), protect in situ and stop work in immediate area and appoint archaeologist to exhume or sample as needed (where relevant). In terms of Section 38 (4) (c) (i) of the National Heritage Resources Act (Act 25 of 1999) (NHRA), if any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, the SAHRA Development Applications Unit (DAU) (Natasha Higgitt 021 202 8660/ nhiggitt@sahra.org.za) must be alerted as per Section 35(3) of the NHRA. Non-compliance with this section of the NHRA is an offense in terms of Section 51(1)e of the NHRA is an offense in terms of Section 38 (4) (c) (ii) of the NHRA, if unmarked human burials are uncovered, the SAHRA DAU (Natasha Higgitt 021 202 8660/ nhiggitt@sahra.org.za) must be alerted immediately as per Section 51(1)e of the NHRA and item 5 of the Schedule. In terms of Section 38 (4) (e) (ii) of the NHRA and item 5 of the Schedule. In terms of Section 38 (4) (e) with regards to the appointment of specialists, if heritage resources are uncovered during the course of the development, a professional 	CONSTRUCTION PHASE							
archaeologist or palaeontologist, depending on the nature of the finds, must be contracted	 Reporting chance finds of graves and dense clusters of artefacts as early as possible to an archaeologist and/or the South African Heritage Resources Agency (SAHRA) (https://www.sahra.org.za/contact/), protect in situ and stop work in immediate area and appoint archaeologist to exhume or sample as needed (where relevant). In terms of Section 38 (4) (c) (i) of the National Heritage Resources Act (Act 25 of 1999) (NHRA), if any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, the SAHRA Development Applications Unit (DAU) (Natasha Higgitt 021 202 8660/ nhiggitt@sahra.org.za) must be alerted as per Section 35(3) of the NHRA. Non-compliance with this section of the NHRA is an offense in terms of Section 51(1)e of the NHRA and item 5 of the Schedule. In terms of Section 38 (4) (c) (ii) of the NHRA, if unmarked human burials are uncovered, the SAHRA DAU (Natasha Higgitt 021 202 8660/ nhiggitt@sahra.org.za) must be alerted immediately as per Section 36(6) of the NHRA. Non-compliance with this section of the Schedule. In terms of Section 38 (4) (e) with regards to the appointment of specialists, if heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as coop are pagesible to insport the horitage resources of the beritage resources of the beritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as coop are pagesible to insport the beritage resources of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as coop are pagesible to i	To be completed	post EA by relevant	parties.				

Im Mi	pact Management Outcomes: Avoid impacts (preferred) or locate and sample or rescue nimise landscape scarring. Minimise intrusion into the cultural landscape. Minimise co	sites/burials bef	ore disturbance. Res ollution.	scue information, ar	tefacts or burials	before extensive	e damage occurs.
	· · · · · · · · · · · · · · · · · · ·	Implementation	1		Monitoring		
lm	pact Management Actions	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
•	resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA. Ensure that the Northern Cape Heritage Resources Authority is alerted immediately if any evidence on structures older than 60 years is found during the construction phase. Ensure disturbance is kept to a minimum and does not exceed project requirements. Minimise the duration of the activities. At the end of the construction period, rehabilitate areas, not needed during operation.						
OF	ERATIONAL PHASE	1					
-	Reporting chance finds of graves and dense clusters of arteracts as early as possible to an archaeologist and/or the SAHRA (https://www.sahra.org.za/contact/), protect in situ and stop work in immediate area and appoint archaeologist to exhume or sample as needed (where relevant) In terms of Section 38 (4) (c) (i) of the National Heritage Resources Act (Act 25 of 1999)	I o de complete	d post EA by relevant	parties.			
	(NHRA), if any evidence of archaeological sites of remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, the SAHRA Development Applications Unit (DAU) (Natasha Higgitt 021 202 8660/ nhiggitt@sahra.org.za) must be alerted as per Section 35(3) of the NHRA. Non-compliance with this section of the NHRA is an offense in terms of Section 51(1)e of the NHRA and item 5 of the Schedule.						
•	In terms of Section 38 (4) (c) (ii) of the NHRA, if unmarked human burials are uncovered, the SAHRA DAU (Natasha Higgitt 021 202 8660/ nhiggitt@sahra.org.za) must be alerted immediately as per Section 36(6) of the NHRA. Non-compliance with this section of the NHRA is an offense in terms of Section 51(1)e of the NHRA and item 5 of the Schedule.						
•	In terms of Section 38 (4) (e) with regards to the appointment of specialists, if heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA.						
•	Ensure that all maintenance vehicles and operational activities stay within designated areas.						
	Paint buildings in earthy colours to reduce contrast. Make use of motion detectors and downlighting to reduce night-time light pollution.						

Imp Min	npact Management Outcomes: Avoid impacts (preferred) or locate and sample or rescue sites/burials before disturbance. Rescue information, artefacts or burials before extensive damage occurs. inimise landscape scarring. Minimise intrusion into the cultural landscape. Minimise contrast and light pollution.						
		Implementation	۱		Monitoring		
Imp	act Management Actions	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of
DE	COMMISSIONING PHASE	reison	Implementation	Implementation	reison	1	Compliance
•	Reporting chance finds of graves and dense clusters of artefacts as early as possible to an archaeologist and/or the SAHRA (https://www.sahra.org.za/contact/), protect in situ and stop work in immediate area and appoint archaeologist to exhume or sample as needed (where relevant)	To be completed	d post EA by relevant	parties.			
•	In terms of Section 38 (4) (c) (i) of the National Heritage Resources Act (Act 25 of 1999) (NHRA), if any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, the SAHRA Development Applications Unit (DAU) (Natasha Higgitt 021 202 8660/ nhiggitt@sahra.org.za) must be alerted as per Section 35(3) of the NHRA. Non-compliance with this section of the NHRA is an offense in terms of Section 51(1)e of the NHRA and item 5 of the Schedule.						
•	In terms of Section 38 (4) (c) (ii) of the NHRA, if unmarked human burials are uncovered, the SAHRA DAU (Natasha Higgitt 021 202 8660/ nhiggitt@sahra.org.za) must be alerted immediately as per Section 36(6) of the NHRA. Non-compliance with this section of the NHRA is an offense in terms of Section 51(1)e of the NHRA and item 5 of the Schedule.						
•	In terms of Section 38 (4) (e) with regards to the appointment of specialists, if heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA. Ensure disturbance is kept to a minimum and does not exceed project requirements. Minimise the duration of the activities. Rehabilitate the entire site once the infrastructure						
	has been removed.						

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

7.8 PALAEONTOLOGY

Imp	pact Management Outcomes: Safeguarding, recording, and sampling of palaeontologica	al materials enco	untered or exposed	during construction	and decommiss	ioning (Chance F	ossil Finds).	
		Implementation			Monitoring			
Imp	pact Management Actions	Responsible	Method of	Timeframe for	Responsible	Froquency	Evidence of	
		Person	Implementation	Implementation	Person	Frequency	Compliance	
CO	NSTRUCTION AND DECOMMISSIONING PHASE							
•	If any fossiliferous deposits are exposed by surface clearance or excavations during the	To be completed	post EA by relevant	parties.				
	construction and decommissioning phases of the development, the Chance Fossils Finds							
	Protocol outlined in Appendix C of this EMPr must be fully implemented. The ECO must							
	familiarise themselves with the Chance Fossils Finds Protocol and ensure that it is kept on							
	file on site.							
•	The ECO should be made aware of the possibility of important fossil remains being found							
	or unearthed during the construction phase. Ensure that monitoring of all bedrock							
	excavations (> 1 m) and major cleared sites for fossil remains is undertaken on an on-going							
	basis by the ECO during the construction and decommissioning phases.							
•	Significant fossil finds should be safeguarded and reported as soon as possible to the South							
	African Heritage Resources Agency (SAHRA) (Contact details: 111 Harrington Street,							
	Cape Town, 8001. PO Box 4637, Cape Town, 8000. Tel: 021 462 4502. Fax: 021 462 4509.							
	Email: info@sahra.org.za).							

7.9 GEOTECHNICAL

Impact Management Outcomes: Manage displacement of geological materials, and thus disturbance of existing soil conditions, impact on vegetation and potential soil erosion. To minimize the contamination of geologic materials caused by spillages/leakages. To minimise soil erosion by appropriately managing the displacement of geological materials, thereby minimising disturbance of existing soil conditions. To minimise erosion caused by the creation of unnatural hard surfaces i.e., road surfaces and stormwater drainage.

Impact Management Actions		Implementation			Monitoring		
		Responsible	Method of	Timeframe for	Responsible	Froquency	Evidence of
		Person	Implementation	Implementation	Person	riequency	Compliance
DE	SIGN PHASE						
•	Stormwater Management Plan must be developed in the pre-construction phase by a						
	qualified professional. It should detail the stormwater structures and management	To be completed	To be completed part EA by relevant partice				
	interventions that must preferably be installed to manage the increase of surface water	ater ater ater ater ater ater ater ater					
	flows directly into any natural systems, where possible and lawful (in consultation with						

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

Impact Management Outcomes: Manage displacement of geological materials, and thus disturbance of existing soil conditions, impact on vegetation and potential soil erosion. To minimize the contamination of geologic materials caused by spillages/leakages. To minimise soil erosion by appropriately managing the displacement of geological materials, thereby minimising disturbance of existing soil conditions. To minimise erosion caused by the creation of unnatural hard surfaces i.e., road surfaces and stormwater drainage. Implementation Monitoring **Impact Management Actions** Timeframe for Responsible Method of Responsible Evidence of Frequency Person Implementation Implementation Person Compliance suitably qualified professionals). Effective stormwater management must include effective stabilisation (e.g., gabions and Reno mattresses) of exposed soil. • Ensure that the design allows for suitable stormwater management systems to be installed along roads and other areas in order to divert water away from zones where the proposed infrastructure is to be constructed. Drainage systems should be designed by an appropriately qualified professional. Drainage in the region should be designed appropriately. Investigate and confirm the geotechnical suitability of each structure (or other appropriate level of investigation) prior to construction (i.e., determine that soil with an adequate bearing capacity is obtained beneath each footing). Such investigations would not be required to fulfil the requirements of this Environmental Impact Assessment (EIA) process. However, it would be necessary prior to construction. The seismicity in the region should be considered during design. Favour dolerite as an aggregate (as opposed to Karoo sandstones and mudstones). Subject to investigation. Any road cuttings should be designed by and appropriately gualified professional. • CONSTRUCTION PHASE Drainage in the region should be managed appropriately. To be completed post EA by relevant parties. . Stormwater systems should be monitored throughout the first few months of use during the construction phase during which any erosion/sedimentation must be resolved through any additional interventions that may be necessary (e.g., extension, energy dissipaters, spreaders, etc.). It is recommended that rehabilitation commence soon after construction at the optimal time for vegetation establishment. Only strip vegetation necessary for the next phase of construction. Install temporary drainage to divert stormwater away from active construction activities, . where required. . Where impacted through construction-related activities, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled. Sloped areas stabilised using designed structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly. Any rehabilitation should be scheduled to ensure rehabilitation can take place at the optimal time for vegetation establishment.

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

Impact Management Outcomes: Manage displacement of geological materials, and thus disturbance of existing soil conditions, impact on vegetation and potential soil erosion. To minimize the contamination of geologic materials caused by spillages/leakages. To minimise soil erosion by appropriately managing the displacement of geological materials, thereby minimising disturbance of existing soil conditions. To minimise erosion caused by the creation of unnatural hard surfaces i.e., road surfaces and stormwater drainage.

		Implementation)		Monitoring			
Imp	pact Management Actions	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of	
		Person	Implementation	Implementation	Person	Trequency	Compliance	
•	Where earthwork is being undertaken near any watercourses, slopes must be stabilised							
	using suitable materials, e.g., sandbags or geotextile fabric, to prevent sand and rock from							
	entering the channel.							
•	Appropriate rehabilitation and re-vegetation measures for any disturbed watercourse banks							
	must be implemented timeously. In this regard, the banks should be appropriately and							
	incrementally stabilised as soon as development allows.							
•	During the execution of the works, appropriate measures to prevent pollution and							
	contamination of the riparian environment must be implemented, e.g. including ensuring							
	that construction equipment is well maintained.							
•	Provision must be made for refuelling at the storage area by protecting the soil with an							
	impermeable groundcover. Where dispensing equipment is used, a drip tray must be used							
	to ensure small spills are contained.							
•	Where refuelling away from the dedicated refuelling station is required, a mobile refuelling							
	unit must be used. Appropriate ground protection such as drip trays must be used.							
•	If spillages occur, they should be contained and removed as rapidly as possible, with correct							
	disposal procedures of the spilt material, as reported. Proof of disposal (waste disposal							
	slips or waybills) should be obtained and retained on file for auditing purposes.							
OP	ERATIONAL PHASE	· · · · ·						
•	Install drainage to divert stormwater away from activities, roads/tracks, structures and	I o be completed	post EA by relevant	parties.				
	erected structures, where required.							
•	Implement the stormwater management plan. Generic management for typical							
	intrastructure of the proposed development, including similar erosion control and							
	stormwater management during the construction phase, and no regular maintenance							
	activities to take place outside of the authorised rootprint and all vehicles to remain on							
۱.	During the execution of the executions, apprendiate measures to prevent pollution and							
-	contamination of the riparian environment must be implemented e.g. including ensuring that							
	construction equipment is well maintained							
	Provision must be made for refuelling at the storage area by protecting the soil with an							
-	impermeable aroundcover/hunding. Where dispensing equipment is used a drip tray must							
	be used to ensure small spills are contained							
-	Where refuelling away from the dedicated refuelling station is required, a mobile refuelling							
	unit must be used. Appropriate ground protection such as drip travs must be used.							
•	impermeable groundcover/bunding. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained. Where refuelling away from the dedicated refuelling station is required, a mobile refuelling unit must be used. Appropriate ground protection such as drip trays must be used.							

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

Impact Management Outcomes: Manage displacement of geological materials, and thus disturbance of existing soil conditions, impact on vegetation and potential soil erosion. To minimize the contamination of geologic materials caused by spillages/leakages. To minimise soil erosion by appropriately managing the displacement of geological materials, thereby minimising disturbance of existing soil conditions. To minimise erosion caused by the creation of unnatural hard surfaces i.e., road surfaces and stormwater drainage. Implementation Monitoring **Impact Management Actions** Responsible Method of Timeframe for Responsible Evidence of Frequency Person Implementation Implementation Person Compliance If spillages occur, they should be contained and removed as rapidly as possible, with correct disposal procedures of the spilled material, as reported. Proof of disposal (waste disposal slips or waybills) should be obtained and retained on file for auditing purposes. DECOMMISSIONING PHASE Only drive and park vehicles where necessary. To be completed post EA by relevant parties. It is recommended that the natural topography to be reinstated and land rehabilitation to near natural state is achieved, i.e., removal of foundations and backfilling of any resultant voids within the soil, as well as removal of hard surfaced areas. Replacement soil should be sourced locally to ensure homogeneity. . Reinstate natural topography where cut-to-fill embankments have been constructed. Implement generic environmental management procedures for infrastructure. During the execution of the decommissioning, appropriate measures to prevent pollution and contamination of the riparian environment must be implemented e.g., including ensuring that equipment is well maintained. Provision must be made for refuelling at the storage area by protecting the soil with an impermeable groundcover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained. • Where refuelling away from the dedicated refuelling station is required, a mobile refuelling unit must be used. Appropriate ground protection such as drip travs must be used. If spillages occur, they should be contained and removed as rapidly as possible, with correct . disposal procedures of the spilled material, as reported. Proof of disposal (waste disposal slips or waybills) should be obtained and retained on file for auditing purposes.

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

7.10 GEOHYDROLOGY

Note from the CSIR: The use of existing boreholes to source groundwater (if available and suitable) is only the third most likely water use option. Water sourced from the local municipality is the first option in terms of viability and the second is to source water from a third party, but consideration of other options is vital. Potential environmental impacts pertaining to local groundwater resources have been considered in the EIA, and various management inputs have been recommended to ensure safe and sustainable management of the groundwater resources in the area. However, these impact management actions are not mandatory if water is indeed sourced from the local municipality or via a third party. The recommendations in this section only apply if groundwater will be used for the project. The management inputs are captured in two phases. Phase 1 will be required to determine if the groundwater is of a suitable quality and quantity; and Phase 2 will only be required if the groundwater quality and quantity are determined more accurately and confirmed it is suitable for use.

Impact Management Outcomes: Avoid over-abstraction of groundwater resources. Minimi	ise the potential o	f groundwater conta	amination.			
	Implementation			Monitoring		
Impact Management Actions	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
DESIGN PHASE		· ·		I		
 Undertake a Phase 1 programme to determine if the groundwater is of a suitable quality and quantity for use during construction, operations and decommissioning. The following should be undertaken: Undertake a full laboratory analysis to confirm that the groundwater can be used for potable and domestic purposes, and determine the treatment required. This Geohydrology Assessment has confirmed that the groundwater is generally of good quality in terms of pH, EC and TDS. Undertake necessary tests to confirm if the groundwater is suitable for construction and concrete batching. Conduct scientific yield tests to determine sustainable abstraction volumes from boreholes that are to be utilised. Undertake a Phase 2 programme once the groundwater quality and quantity are determined more accurately and confirmed it is suitable for use. The following steps will be required for sustainable management of ground water resources: Acquire any historical monitoring data for the region. Determine the volume of groundwater abstracted by farmers annually prior to construction by flow meters. Ensure water saving techniques are instated and adhered to. Ensure that environmentally safe cleaning agents that breakdown naturally and do not cause adverse effects are used. 	To be completed	post EA by relevant	parties.			

Imp	act Management Outcomes: Avoid over-abstraction of groundwater resources. Minimi	se the potential o	f groundwater cont	tamination.			
		Implementation			Monitoring		
Imp	act Management Actions	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of
		Person	Implementation	Implementation	Person	Trequency	Compliance
	 In the event that the entire Kudu Solar Facility development is constructed simultaneously, adherence to the recommended mitigation measures should be strictly followed to prevent over-abstraction. Instate an appropriate monitoring program including monitoring of groundwater quality, water levels (ideally by water level loggers and hand readings using a dip meter) and abstracted volumes. These data should be reported on at the least 						
	biannually.						
•	Yield test all monitoring boreholes according to SANS 10299-4:2003, Part 4 – Test pumping						
	of water boreholes. This includes a Step Test, Constant Discharge Test and recovery						
	monitoring.						
CO	NSTRUCTION PHASE						
· · · ·	Adhere to the borehole's safe yield and to monitor water levels and flow. Boreholes must be correctly yield tested according to the National Standard (SANS 10299-4:2003, Part 4 – Test pumping of water boreholes). This includes a Step Test, Constant Discharge Test and recovery monitoring. A monitoring program needs to be adhered to so as to determine and remain below safe abstraction rates. This monitoring programme must only be implemented if groundwater will be used on site for construction purposes. Vehicles must be regularly serviced and maintained to check and ensure there are no leakages. Any engines that stand in one place for an excessive length of time must have drip trays. Diesel fuel storage tanks, if required, should be above ground on an impermeable surface in a bunded area. Vehicles and equipment should also be refuelled on an impermeable surface. A designated area should be established at the construction site camp for this purpose, if off-site refuelling is not possible. If spillages occur, they should be contained and removed as rapidly as possible, with correct disposal procedures of the spilled material, and reported. Proof of disposal (waste disposal slips or waybills) should be obtained and retained on file for auditing purposes	I o be completed	post EA by relevant	parties.			
OP	ERATIONAL PHASE	1					
•	Adhere to the borehole's safe yield and to monitor water levels and flow. Boreholes must be correctly yield tested according to the National Standard (SANS 10299- 4:2003, Part 4 – Test pumping of water boreholes). This includes a Step Test, Constant Discharge Test and recovery monitoring.	To be completed	post EA by relevant	parties.			

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

Im	pact Management Outcomes: Avoid over-abstraction of groundwater resources. Minimi	se the potential of	of groundwater cont	amination.				
		Implementation	1		Monitoring	Monitoring		
Im	pact Management Actions	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of	
		Person	Implementation	Implementation	Person	Trequency	Compliance	
•	Use environmentally safe cleaning agents that breakdown naturally and do not cause							
	adverse effects.							
DE	COMMISSIONING PHASE							
•	Adhere to the borehole's safe yield and to monitor water levels and flow.	To be completed	d post EA by relevant	parties.				
-	Boreholes must be correctly yield tested according to the National Standard (SANS 10299-							
	4:2003, Part 4 – Test pumping of water boreholes). This includes a Step Test, Constant							
	Discharge Test and recovery monitoring.							
-	Vehicles must be regularly serviced and maintained to check and ensure there are no							
	leakages.							
-	Any engines that stand in one place for an excessive length of time must have drip trays.							
	Diesel fuel storage tanks, if required, should be above ground on an impermeable surface							
i i	in a bunded area.							
-	Vehicles and equipment should also be refuelled on an impermeable surface. A designated							
	area should be established at the construction site camp for this purpose, if off-site							
	refuelling is not possible.							
-	If spillages occur, they should be contained and removed as rapidly as possible, with							
	correct disposal procedures of the spilled material, and reported. Proof of disposal (waste							
	disposal slips or waybills) should be obtained and retained on file for auditing purposes							

7.11 SOCIO-ECONOMIC

Impact Management Actions		Implementation	Monitoring				
		Responsible	Method of	Timeframe for	Responsible	Eroquonov	Evidence of
		Person	Implementation	Implementation	Person	Frequency	Compliance
DE	IGN PHASE						
Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and		d To be completed post EA by relevant partice					
	during the construction phase.		A by relevant parties	5.			

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

		Implementation			Monitoring		
Imp	act Management Actions	Responsible	Method of	Timeframe for	Responsible	Froquency	Evidence of
		Person	Implementation	Implementation	Person	Frequency	Compliance
•	Where reasonable and practical, the proponent should appoint local contractors and						
	implement a 'locals first' policy, especially for semi and low-skilled job categories. However,						
	due to the low skills levels in the area, the majority of skilled posts are likely to be filled by						
	people from outside the area.						
•	Where feasible, efforts should be made to employ local contactors that are compliant with						
	Broad Based Black Economic Empowerment (BBBEE) criteria.						
•	Before the construction phase commences (i.e. during the planning phase), the proponent						
	should meet with representatives from the Renosterberg Local Municipality (RLM) and						
	Emthanjeni Local Municipality (ELM) to establish the existence of a skills database for the						
	area. If such as database exists, it should be made available to the contractors appointed						
	for the construction phase.						
•	The local authorities, community representatives, and organisations on the interested and						
	affected party database should be informed of the final decision regarding the project and						
	the potential job opportunities for locals and the employment procedures that the proponent						
	intends following for the construction phase of the project.						
•	Where feasible, training and skills development programmes for locals should be initiated						
	prior to the initiation of the construction phase.						
•	The recruitment selection process should seek to promote gender equality and the						
	employment of women wherever possible.						
-	The proponent should liaise with the RLM and ELM with regards the establishment of a						
	database of local companies, specifically BBBEE companies, which qualify as potential						
	service providers (e.g., construction companies, catering companies, waste collection						
	companies, security companies etc.) prior to the commencement of the tender process for						
	construction service providers. These companies should be notified of the tender process						
	and invited to bid for project-related work.						
CO	ISTRUCTION PHASE						
•	Implement the SEP during the construction phase.	To be completed post E	A by relevant partie	S.			
•	Where reasonable and practical, the proponent should appoint local contractors and						
	implement a 'locals first' policy, especially for semi and low-skilled job categories. However,						
	due to the low skills levels in the area, the majority of skilled posts are likely to be filled by						
	people from outside the area.						

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

		Implementation			Monitoring		
Imp	act Management Actions	Responsible	Method of	Timeframe for	Responsible	Froquoney	Evidence of
		Person	Implementation	Implementation	Person	Frequency	Compliance
-	Where feasible, efforts should be made to employ local contactors that are compliant with				· · · · · · · · · · · · · · · · · · ·		
	BBBEE criteria.						
•	If a skills database for the RLM and ELM exists, ensure that it is being considered by						
	contractors appointed for the construction phase.						
-	Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP)						
	prior to and during the construction phase.						
-	The SEP and CHSSP should include a Grievance Mechanism that enables stakeholders to						
	report and resolve incidents.						
-	Where possible, the proponent should make it a requirement for contractors to implement a						
	'locals first' policy for construction jobs, specifically for semi and low-skilled job categories.						
•	The proponent should consider the option of establishing a Monitoring Committee (MC) for						
	the construction phase that include representatives from local landowners, farming						
	associations, and the local municipality. This MC should be established prior to						
	commencement of the construction phase and form part of the SEP.						
•	The proponent and contractor should develop a Code of Conduct (CoC) for construction						
	workers. The code should identify which types of behaviour and activities are not						
	acceptable. Construction workers in breach of the code should be subject to appropriate						
	disciplinary action and/or dismissed. All dismissals must comply with the South African						
	labour legislation. The CoC should be signed by the proponent and the contractors before						
	the contractors move onto site. The CoC should form part of the CHSSP.						
•	The proponent and the contractor should implement an HIV/AIDS, COVID-19, and						
	Tuberculosis (TB) awareness programme for all construction workers at the outset of the						
	construction phase. The programmes should form part of the CHSSP.						
•	The contractor should provide transport for workers to and from the site on a daily basis.						
	This will enable the contactor to effectively manage and monitor the movement of						
	construction workers on and off the site.						
•	The contractor must ensure that all construction workers from outside the area are						
	transported back to their place of residence within 2 days for their contract coming to an						
	end.						
•	The proponent, in consultation with the LM, should investigate the option of establishing a						
	MC to monitor and identify potential problems that may arise due to the influx of job seekers						
	to the area.						

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

		Implementation			Monitoring		
Imp	act Management Actions	Responsible	Method of	Timeframe for	Responsible	Froqueney	Evidence of
		Person	Implementation	Implementation	Person	Frequency	Compliance
-	The proponent should implement a policy that no employment will be available at the gate.						
-	The proponent should enter into an agreement with the local farmers in the area whereby						
	damages to farm property as a result of the construction phase will be compensated for.						
	The agreement should be signed before the construction phase commences.						
•	All farm gates must be closed after passing through.						
-	Contractors appointed by the proponent should provide daily transport for low and semi-						
	skilled workers to and from the site.						
-	The proponent should hold contractors liable for compensating farmers and communities in						
	full for any stock losses and/or damage to farm infrastructure that can be linked to project						
	construction workers. This should be contained in the CoC to be signed between the						
	proponent, the contractors, and neighbouring landowners. The agreement should also cover						
	loses and costs associated with fires caused by construction workers or construction related						
	activities (see below).						
-	The proponent should implement a Grievance Mechanism that provides local farmers with						
	an effective and efficient mechanism to address issues related to damage to farm						
	infrastructure, stock theft and poaching etc.						
-	Contractors appointed by the proponent must ensure that all workers are informed at the						
	outset of the construction phase of the conditions contained in the CoC, specifically						
	consequences of stock theft and trespassing on adjacent farms.						
-	Contractors appointed by the proponent must ensure that construction workers who are						
	found guilty (by the courts) of stealing livestock and/or damaging farm infrastructure are						
	dismissed and charged. This should be contained in the CoC.						
-	It is recommended that no construction workers, with the exception of security personnel,						
	should be permitted to stay over-night on the site.						
-	Contractor should ensure that open fires on the site for cooking or heating are not allowed						
	except in designated areas.						
-	Smoking on site should be confined to designated areas.						
-	Contractor should ensure that construction related activities that pose a potential fire risk,						
	such as welding, are properly managed and are confined to areas where the risk of fires						
	has been reduced. Measures to reduce the risk of fires include avoiding working in high						
	wind conditions when the risk of fires is greater. In this regard special care should be taken						
	during the high risk dry, windy summer months.						

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

		Implementation			Monitoring		
Imp	act Management Actions	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of
		Person	Implementation	Implementation	Person	riequonoy	Compliance
•	Contractor should provide adequate fire-fighting equipment on-site, including a fire fighting						
	vehicle and fire extinguishers placed at designated locations across the site.						
•	Contractor should provide fire-fighting training to selected construction staff.						
•	As per the conditions of the CoC, in the event of a fire being caused by construction workers						
	and or construction activities, the appointed contractors must compensate farmers for any						
	damage caused by the project to their farms. The contractor should also compensate the						
	Tire-Tighting costs borne by farmers and local authorities.						
•	activities.						
-	The proponent should establish a MC to monitor the construction phase and the						
	implementation of the recommended mitigation measures. The MC should be established						
	before the construction phase commences, and should include key stakeholders, including						
	representatives from local farmers and the contractor(s). The MC should also address						
	issues associated with damage to roads and other construction related impacts.						
•	Ongoing communication with landowners and road users during construction period. This						
	should be outlined in the SEP.						
•	The proponent should implement a Grievance Mechanism that provides local farmers and						
	other road users with an effective and efficient mechanism to address issues related to						
	construction related impacts, including damage to local gravel farm roads.						
•	implementation of a road maintenance programme throughout the construction phase to						
	the construction phase is completed (for reads where the developer/contractor has legal						
	mandate to undertake such maintenance).						
•	Repair of all affected road portions at the end of construction period where required (for						
	roads where the developer/contractor has legal mandate to undertake such repairs). In the						
	event of damage to public roads affected by construction traffic the proponent should						
	engage with the relevant road authorities to ensure that damage is repaired before the						
	operational phase commences.						
-	Dust suppression measures must be implemented on un-surfaced roads, such as wetting						
	on a regular basis and ensuring that vehicles used to transport building materials are fitted						
	with tarpaulins or covers.						

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

		Implementation			Monitoring		
Imp	act Management Actions	Responsible	Method of	Timeframe for	Responsible	Froquency	Evidence of
		Person	Implementation	Implementation	Person	Frequency	Compliance
•	All vehicles must be roadworthy, and drivers must be qualified and made aware of the						
	potential road safety issues and need for strict speed limits.						
•	The loss of high-quality agricultural land should be avoided and or minimised by careful						
	planning of the final layout of the proposed facility. The recommendations of the agricultural						
	/ soil assessment should be implemented. Note: During the EIA Phase, no sensitive areas						
	for avoidance were identified by the Agricultural specialist. The study area is predominately						
	low to medium sensitivity from an agricultural perspective.						
•	Affected landowners should be consulted about the timing of construction related activities						
	in advance.						
•	The footprint associated with the construction related activities (access roads, construction						
	platforms, workshop etc.) should be minimised.						
-	An ECO should be appointed to monitor the establishment phase of the construction phase.						
-	All areas disturbed by construction related activities, such as access roads on the site,						
	construction platforms, workshop area etc., should be rehabilitated at the end of the						
	construction phase.						
•	The implementation of a rehabilitation programme should be included in the terms of						
	reference for the contractor/s appointed. The specifications for the rehabilitation programme						
	should be included in the EMPr.						
•	The implementation of the Rehabilitation Programme should be monitored by the ECO.						
OP	ERATIONAL PHASE	1					
•	Maximise the number of employment opportunities for local community members.	To be completed post E	A by relevant partie	s.			
•	Implement training and skills development programs for members from the local community.						
•	Maximise opportunities for local content and procurement.						
•	The enhancement measures to enhance local employment and business opportunities						
	during the construction phase also apply to the operational phase.						
-	The proponent should investigate providing training and skills development to enable locally						
	based service providers to provide the required services for the operational phase.						
-	Enter into and implement rental agreements with affected landowners for the use of the land						
	for the establishment of the proposed project.						
•	The loss of high-quality agricultural land should be avoided and/or minimised by careful						
	planning in the final layout. The recommendations of the agricultural / soil assessment						
	should be implemented. Note: During the EIA Phase, no sensitive areas for avoidance were						

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

		Implementation			Monitoring			
Im	pact Management Actions	Res	ponsible	Method of	Timeframe for	Responsible	Froquency	Evidence of
		Per	son	Implementation	Implementation	Person	Frequency	Compliance
	identified by the Agricultural specialist. The study area is predominately low to medium							
	sensitivity from an agricultural perspective.							
•	The RLM or PKSDM should be consulted as to the structure and identification of potential							
	trustees to sit on the Community Trust. The key departments in the RLM or PKSDM that							
	should be consulted include the Municipal Managers Office, IDP Manager and LED							
	Manager, where possible.							
-	Clear criteria for identifying and funding community projects and initiatives in the area should							
	be identified. The criteria should be aimed at maximising the benefits for the community as							
	a whole and not individuals within the community.							
-	Strict financial management controls, including annual audits, should be instituted to							
	manage the funds generated for the Community Trust from the proposed project.							
•	The recommendations contained in the VIA should be implemented.							
-	Ensure that an open communication strategy is created and maintained between the Project							
	Developer and owners (or managers) of nearby or adjacent farms where hunting takes place							
	in order to ensure that the Project Developer are made aware of planned hunts.							
-	Ensure that operational personnel are made aware of the planned hunts and are trained on							
	the necessary protocols to be taken.							
DE	COMMISSIONING PHASE							
•	The proponent should ensure that retrenchment packages are provided for all staff	•	To be completed po	ost EA by relevant p	parties.			
	retrenched when the plant is decommissioned.							
•	All structures and infrastructure associated with the proposed facility should be dismantled							
	and transported off-site on decommissioning.							
•	Revenue generated from the sale of scrap metal during decommissioning should be							
	allocated to aid in funding closure and rehabilitation of disturbed areas.							

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

APPENDIX A: CV OF THE EAP

CV OF PAUL LOCHNER

Employer: Council for Scientific and Industrial Research (CSIR) PO Box 320, Stellenbosch, 7600, South Africa Phone: +27 21 888 2486 (w) Email: <u>plochner@csir.co.za</u> Date of Birth: 13 June 1969 Nationality: South African

BIOSKETCH

Paul Lochner is an environmental assessment practitioner at the CSIR in Stellenbosch, with 29 years of experience in a wide range of environmental assessment and management studies. His particular experience is in environmental planning and assessment for renewable energy, electricity grid infrastructure, desalination, oil & gas, wetlands & coastal zone management, and industrial & port development. He has been closely involvement in the research and application of Strategic Environmental Assessment in South Africa, and also has wide experience in Environmental & Social Impact Assessment, Environmental Management Programs and Environmental Screening Studies. For the past 13 years he has been the leader of a group of approximately 10 to 20 environmental scientists that has been at the forefront of advancing environmental assessment in South Africa.

PROFESSIONAL PROFILE

- Commenced work at CSIR in 1992, after completing a B.Sc. degree in Civil Engineering and a Masters in Environmental Science, both at the University of Cape Town. CSIR is a national science council. His initial work at focused on wetlands and estuarine management; environmental engineering in the coastal zone; and coastal zone management plans.
- As the market for environmental assessment work grew, he led Environmental Impact Assessments (EIAs), in particular for coastal and large-scale industrial developments; Strategic Environmental Assessments (SEAs) for new industrial development zones; and Environmental Management Plans (EMPs) for wetlands, estuaries and coastal developments. He has been the project leader for several SEAs and EIAs over the past 28 years.
- In 1998-2000, he was the project manager for CSIR's <u>three year research program</u> into Strategic Environmental Assessment (SEA). This led to him being a lead author of the *Guideline Document for SEA* in South Africa, published by CSIR and the national Department of Environmental Affairs (DEA) in February 2000.
- In 1999-2000, he was project manager for the legal, institutional, policy, financial and socio-economic component of the <u>Cape Action Plan for the Environment</u> ("CAPE"), a large-scale GEF-funded study to ensure sustainable conservation of the Cape Floral Kingdom. It was prepared for WWF-South Africa and required extensive interaction with experts, government and civil society.
- Over the past 24 years has been closely involved with several environmental studies for <u>industrial and port-related projects</u> in the Coega Industrial Development Zone (IDZ), near Port Elizabeth. This included the SEA for the establishment of the Coega IDZ in 1996/7.
- He is a leading expert in <u>Environmental Management Programs</u> (EMPs), both the preparation of EMPs as well as overseeing the implementation thereof. In recognition of his experience in this domain, he was appointed by the Western Cape government to write the *Guidelines for EMPs* that is still being used in the province.
- He has prepared EMPs for <u>wetlands and estuaries</u>, such as for the establishment of the Rietvlei Nature Reserve and Intaka Island Nature Reserve, both in Cape Town.
- He has experience in overseeing the implementation of EMPs, and has been the chairperson of the <u>Environmental</u> <u>Monitoring Committee</u> for the Intaka Island Nature Reserve in Cape Town since 1996. He is also Chairperson of the Intaka Island Environmental Trust.
- He has undertaken more than 30 environmental assessments for the <u>renewable energy</u> sector, in particular for wind and solar photovoltaic energy projects.
- He has been part of almost all environmental studies for medium to large scale reverse osmosis sea water <u>desalination</u> plants conducted in the past 10 years in South Africa and Namibia. This includes site selection study and EIA for the Namwater desalination plant near Swakopmund in Namibia, the two Umgeni Water plants at Tongaat and Lovu on the KwaZulu-Natal coast, and desalination plants at Coega, Saldanha and Cape Town.
- Since 2008, Paul has been the leader and manager of the Environmental Management Services (EMS) group within CSIR. This group consists environmental scientists, planners and engineers, with offices in Stellenbosch, Cape Town and Durban.
- He has extensive experience in conducting environmental assessments in accordance with <u>requirements of international</u> <u>lenders</u>, such as the World Bank performance requirements, International Finance Corporation (IFC) performance standards and the Equator Principles.

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

- Over the past eight years, he has been project leader on <u>national-scale SEAs being conducted for national DEA</u> and other government departments in support of the Strategic Integrated Projects (SIPs) of government and the National Development Plan for South Africa. These SEAs provided strategic geospatial planning for new large-scale national infrastructure priorities. The SEA methodology applied was highly innovative and has received national and international awards. The studies have generated new environmental planning tools to support responsible decision-making, and the SEA outcomes have been converted into national legislation and informed policy-making.
- He has authored more than 15 international journal publications, peer reviewed conference proceedings and published national guidelines (a publications record is available on request).

PERSONAL SKILLS AND CAPABILITIES

- Holistic understanding of environmental and social aspects at policy, program and project levels
- Ability to lead, inspire and motivate a team of environmental scientists in a consulting business
- Coordination of experts from diverse disciplines to support evidence-based decision-making
- Ability to integrate of environmental, social and economic aspects within a systems model
- Design of innovative processes to respond effectively to proposals and meet needs of clients
- Review and quality assurance for environmental assessment processes and reports
- Project management, financial management, report writing and communication skills.

EDUCATION

- BSc (Civil Engineering) awarded with Honours, University of Cape Town, 1990
- MPhil (Environmental Science), University of Cape Town, 1992

EMPLOYMENT

- Environmental scientist at CSIR (Stellenbosch) from October 1992 to present.
- Group Leader of CSIR Environmental Management Services since August 2008.

PROFESSIONAL REGISTRATION

Environmental Assessment Practitioners Association of South Africa (EAPASA), Registration no. 2019/745.

PROFESSIONAL MEMBERSHIP AND POSITIONS HELD

- Member of the International Association for Impact Assessment (IAIA)
- 1996 to 1999: Committee Member of the Western Cape Branch of the International Association for Impact Assessment (IAIA) and Chairperson in 1997-1998.
- 1996 to present: Chairperson of Blouvlei Intaka Island Environmental Committee at Century City, Cape Town, which
 oversees management of the Intaka Island Nature Reserve
- 2010 to present: Chairperson of Intaka Island Environmental Trust, that oversees the operation of the Eco-centre and education program at the Intaka Island Nature Reserve
- 2017: Conference Organising Committee member and Program Director for IAIA South Africa national conference, August 2017, Goudini.

RECENT PROFESSIONAL AWARDS

- 2018: International Association for Impact Assessment (IAIA) regional award for contribution to the development of Strategic Environmental Assessment in South Africa, awarded at the annual international conference of IAIA in May 2018, held in Durban, South Africa.
- 2017: CSIR Implementation Unit "Directors award" for outstanding contribution by an individual.
- 2017: CSIR Implementation Unit award for Collaboration, for the role of the Shale Gas SEA team in coordinating expertise from across CSIR.
- 2015: CSIR Implementation Unit award for "outstanding contribution by a team" for the Wind and Solar Photovoltaic SEA and Electricity Grid SEA.

TRACK RECORD OF PROFESSIONAL EXPERIENCE

This is an abbreviated record of experience. A full record is available on request. Projects are located in South Africa unless otherwise stipulated.

Duration	Project description	Role	Client
2023 -	Power-to-X (PtX) Pathways Grant for green hydrogen	Co-author &	Deutsche Gesellschaft für
ongoing	analysis to support policy development and private sector	researcher	Internationale
	investment for south Africa		Zusammenarbeit (GIZ)
2022 -	Green hydrogen market opportunities for South Africa:	Co-author &	GIZ (CSIR is part of
ongoing	Analyses of lighthouse projects and guidance for	researcher	consulting team with GFA)
	Environmental & Social Impact Assessments		

Duration	Project description	Role	Client
2022 -	EIA and Basic Assessments for 1760 MW of wind and solar	Project leader	Genesis Eco-Energy
ongoing	PV facilities near Beaufort West		Developments (Pty) Ltd
2022-2023	EIAs for 720 MW Kaladokhwe wind energy facilities (x3) near Cradock	Project leader	Atlantic Energy Partners
2022-2023	Environmental Screening for 1GW offshore wind energy planning off KwaZulu Natal, South Africa	Reviewer	Progression Energy, USA
2022-2023	Environmental assessment training and support (phase 2) for renewable energy planning and the IPP sector for the Eastern Cape province	Project leader	Dept of Economic Development, Environmental Affairs & Tourism, Eastern Cape
2022 – 2023	EIA and Basic Assessment for the Enertrag Vhuvhili 300 MW solar PV facility and electricity grid connection for Sasol, Secunda	Project leader	Enertrag (to supply green energy under contract to Sasol)
2022 - ongoing	Review of permitting and governance for the Mogalakwena Mine, Limpopo	Project leader	Anglo American Platinum
2021- ongoing	Advisory services for environmental permitting for Anglo American's Carbon Neutrality and Smart Power projects in South Africa, Namibia, Botswana and Zimbabwe	Project leader	Anglo American Platinum
2021- ongoing	Permitting strategy for innovative pilot projects for the Mogalakwena platinum mine	Project leader	Anglo American Platinum
2022	Opportunities and constraints analysis for offshore wind potential for South Africa - inventory and collation of spatial data	Project leader	World Bank
2021-2022	Environmental assessment training and support (phase 1) to provincial government in the independent power producer sector in the Eastern Cape province	Project leader	Dept of Economic Development, Environmental Affairs & Tourism, Eastern Cape
2021	Renewable Energy Feasibility Plan for the Atlantis Special Economic Zone, Cape Town	Lead co-leader	Atlantis Special Economic Zone
2021	Basic Assessment for 1350 MW Aardvark solar PV facilities near Copperton	Project leader	ABO Wind renewable energies (Pty) Ltd
2020-2021	Basic Assessments for 1575 MW Solar Photovoltaic Facilities and associated Electrical Grid Infrastructure near Touws River, Western Cape	Project leader	Veroniva
2020	Independent expert review of appeals against the EA for exploration drilling for oil and gas within Offshore Block ER236 off the coast of KwaZulu-Natal	Lead author	DEFF Appeals Directorate
2020	Independent expert review of the appeals against the EA issued for the Inyanda-Roodeplaat Wind Energy Facility of 187 MW proposed near Port Elizabeth	Lead author	DEFF Appeals Directorate
2019-2020	Environmental scoping for a Desalination Plant and Water Carriage System for water supply to Windhoek and the central coastal area of Namibia	Project author	NamWater (Namibia) and KfW Development Bank (Germany)
2019-2020	Environmental Performance Compliance Study for Foundries in South Africa	Project reviewer	National Foundries Technology Network
2019	Independent Expert review of the ecology study as part of the EIA and EMPR for diamond prospecting at Bloemhof Dam Nature Reserve, North West province	Independent reviewer	DEA Appeals Office
2018-2019	Greater Saldanha Bay Strategic Environmental Assessment (SEA): Phase 1 Monitoring and Decision Support System	Project leader	Western Cape provincial government
2018-2019	Environmental Screening Study for a proposed 100 to 150 megalitre/day desalination facility for City of Cape Town, Phase 1: Pre-feasibility study	Project co-leader	City of Cape Town and iX Engineers
2018-2019	EIA for 150 MW wind power project in Ghana	Proposal and EIA Quality Assurance	Volta River Authority and Seljen Consult Ltd
2019	Environmental Assessment for the Kenhardt solar PV facility and electrical infrastructure (100 MW x 3), Northern Cape	Project leader	Scatec Solar Africa (Pty) Ltd

Duration	Project description	Role	Client
2017-2019	SEA for Wind & Solar Photovoltaic Energy development in	Project reviewer	DEA & national Dept of
	South Africa (Phase 2)		Energy (DOE)
2017-2019	SEA for Energy Corridors and development of a gas pipeline	Project reviewer	DEA, DOE, iGas, Eskom
	network for South Africa		(national electricity utility)
2017-2019	SEA for Aquaculture Development in South Africa (marine	Project leader	DEA and national Dept of
	and freshwater)		Agriculture Forestry and
2018	Environmental Assessments for the Viruburg Selar project	Co project manager	Verenive & Sector
2010	(115 MW x 3) in the Vryburg Renewable Energy Development	and co-author	Veroniva & Scalec
	Zone (REDZ)		
2018	EIA for West Bank Waste Water Treatment works marine	Independent reviewer	WSP and Buffalo City
	outfall pipeline, East London		Municipality
2017-2018	Site selection and environmental screening for a proposed	Project leader	City of Cape Town and iX
	120 – 150 ML/day desalination plant for the City of Cape Town		Engineers
2017-2018	EIA and EMP for Icyari Coltan Mine, Rwanda	Project reviewer	Mawarid Mining Rwanda Ltd
2016 2017	SEA for the Square Kilemetre Arrey radio tologoope in the	Drojact laadar	(MMRL), UAE
2010-2017	Karoo, South Africa	Fillectileader	DEA and DST
2016-2017	SEA for Shale Gas Development in the Karoo region of	Proiect co-leader	DEA and other government
	South Africa	,	departments
2015-2016	SEA for the development of Electrical Grid Infrastructure	Project leader	DEA and Eskom (national
	for South Africa		electricity utility)
2017	EIA for the 75 MW x 12 solar photovoltaic energy projects	Project leader	Mainstream Renewable
0011.0015	near Dealesville, Free State	Due le st le s de s	Power SA
2014-2015	EIA for Isnwati Emoyeni 140 MW wind energy project and supporting electrical infrastructure at Murrayshurg. Western	Project leader	Windiad South Africa
	Cape		
2012-2015	SEA for identification of renewable energy zones for wind	Project leader	DEA and other national
	and solar photovoltaic projects in South Africa		government departments
2012-2013	Environmental Screening Study (ESS) for a desalination	Project leader	City of Cape Town &
	plant for the City of Cape Town		WorleyParsons
2012-2013	EIA for the desalination plant for the Saldanha area	Project leader	West Coast District
2012 2012	EIA for the manganese export terminal at the Port of Nagura	Project leader	Transpot
2012-2013	and Coega Industrial Development Zone (IDZ)	Fillectieader	Hanshet
2011 - 2012	EIA (x2) for 100 MW solar photovoltaic project at Blocuso	Project leader	Mainstream Renewable
	and 100 MW solar PV project at Roode Kop in the Northern	,	Power
	Саре		
2011 – 2012	EIA (x2) for 75 MW solar photovoltaic project at GlenThorne	Project leader	Solaire Direct
0040.0044	and 75 MW project at Valleydora, in the Free State	D : (1 1	
2010-2011	More than 10 Basic Environmental Assessments (BAs) for	Project leader	Conducted for Dutch,
	Cape, Fastern Cape and Free State		African companies
2010/2011	EIA for a 100 MW wind project at Zuurbron and a 50 MW	Project leader	WindCurrent SA (German-
	wind project Broadlands in the Eastern Cape	,	based company)
2010/2011	EIA for the proposed 143 MW Biotherm wind energy	Project leader	Biotherm South Africa (Pty)
	project near Swellendam, Western Cape, South Africa		Ltd
2010-2011	EIAs (x4) for the proposed InnoWind wind energy projects	Project leader	InnoWind South Africa (Pty)
	totalling approx 210 MW) Western Cape, South Africa		Ltd
2009-2010	FIA for the proposed Electrawinds wind energy facility of	Project leader	Electrawinds N.V. (Relaium)
	45-75 MW capacity in the Coega IDZ. Eastern Cape		Lissiaminas R.V. (Doigiaili)
2009-2010	EIA for proposed 180 MW Jeffreys Bay wind energy	Project Leader and	Mainstream Renewable
	project, Eastern Cape	co-author	Power South Africa
2009-2010	EIA for the proposed 70 megalitre/day desalination plant	Project leader	NamWater, Namibia
	at Mile 6 near Swakopmund, Namibia		
2009	ESS for a proposed Deepwater Port, Container Hub and	Project Manager	Project Management
	industrial Development Zone, Ghana		international Pty Ltd

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

Duration	Project description	Role	Client
2009	EMP for the Operational Phase of the Berg River Dam,	Project leader and	TCTA (national water supply
	Franschoek, South Africa	report co-author	utility), South Africa
2006	Environmental Impact Assessment (EIA) for extension of	Project Leader and	Transnet National Port
	Port of Ngqura, Eastern Cape	co-author	Authority
2004-2005	Environmental and Social Impact Assessment (ESIA)	Project manager and	Komi Aluminium Russia, IFC,
	report for the proposed alumina refinery near Sosnogorsk,	co-author	European Bank for
	Komi Republic, Russia		Reconstruction &
			Development (EBRD)
2005	Guideline for Environmental Management Plans (EMPs) for	Author	Dept of Environmental Affairs
	the Western Cape province		& Development Planning,
			Western Cape
2003	Environmental Management Plan for the Operational Phase	Project leader and	Century City Property
	of the wetlands and canals at Century City, Cape Town	lead author	Owners' Association
2002	Environmental Impact Assessment for the proposed	Project Manager and	Pechiney, France
	Pechiney aluminium smelter at Coega, South Africa	lead author	
1999-2000	Cape Action Plan for the Environment: a biodiversity	Project manager and	World Wide Fund for Nature
	Strategy and Action Plan for the Cape Floral Kingdom - legal,	contributing writer	(WWF): South Africa and
	institutional, policy, financial and socio-economic component		Global Environment Facility
1000			(GEF)
1999	Management Plan for the coastal zone between the Eerste	Project manager and	Heartland Properties and
	and Lourens River, Faise Bay, South Africa	lead author	Somenem (a Division of
1008	Environmental Accessment of the Mazel Matele Terminal	Draiget manager and	
1990	Environmental Assessment of the Notal Matola Terminal	Project manager and	SINC-Lavalin-EIVIS
	Mozambique	aution	
1006-1007	Strategic Environmental Assessment (SEA) for the	SEA project manager	Coega IDZ Initiative Section
1000 1007	proposed Industrial Development Zone and Harbour at Coera	and report writer	21 Company
	Port Elizabeth. South Africa		21 company
1995-1996	Environmental Impact Assessment and EMP for	Project manager and	Thesen and Co.
	Development Scenarios for Thesen Island, Knysna, South	report writer	
	Africa	·	
1996	Environmental Impact Assessment for the Blouvlei wetlands	Project manager and	Ilco Homes Ltd (now Monex
	at Century City, Cape Town	report writer	Ltd)
1995	Environmental Impact Assessment for the Saldanha Steel	Report author and	Saldanha Steel Project
	Project, South Africa	project manager	
1994	Environmental Impact Assessment for the upgrading of	Project management,	Schneid Israelite and
	resort facilities on Frégate Island, Seychelles	co-author, process	Partners
		facilitator	
1994	Environmental Impact Assessment for exploration drilling in	Project manager and	Chevron Overseas (Namibia)
	offshore Area 2815, Namibia	lead author	Limited
1994	Management Plan for the Rietvlei Wetland Reserve, Cape	Project manager and	Southern African Nature
	Town	lead author	Foundation (now WWF-SA)

RECENT JOURNAL PUBLICATIONS AND PEER REVIEWED PAPERS

A comprehensive list of publications including recent journal publications, book chapters and peer reviewed conference papers, is available on request.

CV VERSION: Paul Lochner, May 2023

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

CV OF ROHAIDA ABED

Name of firm	CSIR
Name of staff	Rohaida Abed
Profession	Environmental Assessment Practitioner
Position in firm	Environmental Assessment Practitioner
Nationality	South African

BIOGRAPHICAL SKETCH

Rohaida Abed is an Environmental Assessment Practitioner in the CSIR Environmental Management Services team based in Durban. She has 12 years of experience in the Environmental Management field, and has been involved in various transport infrastructure related projects as an Environmental Control Officer, which included monitoring compliance with Environmental Authorizations and Environmental Management Plans. She has also been conducting Environmental Assessments relating to Port infrastructure, Bulk Liquid Storage facilities and renewable energy in the capacity of Project Manager.

She has been involved in Screening Studies, Applications for Amendments to Environmental Authorisations, Environmental Management Programmes, Legislative Reviews and reviewing Specialist Studies. She was also the Project Manager for the Gas Pipeline and Electricity Grid Infrastructure Expansion Strategic Environmental Assessment (SEA) for the National DEA, DOE, DPE, iGas, Transnet and Eskom.

TERTIARY EDUCATION

Year	Degree	Institution
2007 - 2009	Master of Science (Environmental Science)	University of KwaZulu-Natal
2006 - 2006	Bachelor of Science Honours (Environmental Science)	University of KwaZulu-Natal
2003 - 2005	Bachelor of Science (Environmental Science)	University of KwaZulu-Natal

PROFESSIONAL REGISTRATION

- Registered Professional Natural Scientist (Pr.Sci.Nat.) in Environmental Science (Registration Number: 400247/14) with the South African Council of Natural Scientific Professions (SACNASP) in July 2014.
- Environmental Assessment Practitioners Association of South Africa (EAPASA), Registration Number 2021/4067
- Member of the International Association for Impact Assessment South Africa (IAIAsa) Membership number: 5840

EMPLOYMENT RECORD

Period	Employer	Position		
October 2011 - to	CSIR	Environmental Assessment Practitioner		
present	65 IX			
May 2010 – September	Hanwood & Nyumala Consulting Engineers	Environmental Scientist		
2011	Herwood & Nxumalo Consulting Engineers			
March 2010 – April 2010	EnAq Consulting	Environmental Officer		
2006 – 2008	University of KwaZulu-Natal	Academic Demonstrator		

LIST OF KEY PROJECT EXPERIENCE

Date	Project Description	Role	Client
2022- ongoing	Review of permitting and governance for the Mogalakwena Mine, Limpopo (Confidential)	Project Manager	Anglo American
2021 – current	Advisory services for environmental permitting for Anglo American's Carbon Neutrality and Smart Power projects in South Africa, Namibia, Botswana and Zimbabwe (Confidential)	Project Manager and Lead Author	Anglo American
2021 – current	Pilot Study on Permitting (Confidential)	Project Manager and Author	Anglo American
2021 – current	Scoping and Environmental Impact Assessment Processes for the Proposed Development of 12 Solar Photovoltaic (PV) Facilities (Kudu Solar Facility 1 to 12), near De Aar in the Northern Cape Province	Project Manager and Author	ABO Wind renewable energies (Pty) Ltd

Date	Project Description	Role	Client
2021 - current	Scoping and Environmental Impact Assessment Processes for the Proposed Development of six Solar Photovoltaic (PV) Facilities; Aardvark Solar 1, Aardvark Solar 2, Aardvark Solar 3, Aardvark Solar 4, Aardvark Solar 5 and Aardvark Solar 6, near Copperton in the Northern Cape Province	Project Leader and Project Reviewer	ABO Wind renewable energies (Pty) Ltd
2021 - current	Basic Assessment Processes for electricity grid infrastructure to support the six Solar Photovoltaic (PV) Facilities; Aardvark Solar 1, Aardvark Solar 2, Aardvark Solar 3, Aardvark Solar 4, Aardvark Solar 5 and Aardvark Solar 6, near Copperton in the Northern Cape Province	Project Leader and Project Reviewer	ABO Wind renewable energies (Pty) Ltd
2021 – current	Environmental Compliance and Performance Improvement for Foundries: Phase 2	Project Team Member	NFTN and NCPC
2021	EMPr Update and Financial Close Gap Analysis for the Gemsbok Solar PV2, Gemsbok Solar PV5 and Gemsbok Solar PV6 projects near Kenhardt, Northern Cape	Project Reviewer, Author and Team Member	Mulilo Total Coega (PTY) Ltd
2020 – current	Basic Assessment for the Proposed Square Kilometre Array (SKA) fibre optic cable between Beaufort West and Carnarvon,	Project Reviewer and Contributor	South African National Research Network
2020 – current	Scoping and Environmental Impact Assessment Processes for the Proposed Development of three Wind Energy Facilities; Kwagga 1, Kwagga 2, and Kwagga 3, near Beaufort West in the Western Cape Province	Project Reviewer and Team Member	ABO Wind renewable energies (Pty) Ltd
2020 – current	Basic Assessment Processes for the Proposed Development of seven Solar Photovoltaic (PV) Energy Facilities; namely Rinkhals 1, Rinkhals 2, Rinkhals 3, Rinkhals 4, Rinkhals 5, Rinkhals 6, and Rinkhals 7, near Kimberley in the Free State and Northern Cape Provinces	Project Reviewer and Team Member	ABO Wind renewable energies (Pty) Ltd
2020 - current	Four Basic Assessments for the Proposed Gromis and Komas Wind Energy Facilities and Power Lines in the Northern Cape	Project Reviewer, Author and Team Member	Enertrag
2020 - 2021	Four Basic Assessment Processes for the Proposed Development of nine 175 MW Solar Photovoltaic Facilities, associated Infrastructure, and Electrical Grid Infrastructure (i.e. Witte Wall PV 1, Witte Wall PV 2, Grootfontein PV 1, Grootfontein PV 2, Grootfontein PV 3, Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3, and Hoek Doornen PV 4), near Touws River, Western Cape	Project Manager and Lead Author	Veroniva (PTY) Ltd
2020	Independent review of an EIA Project (Confidential)	Project Manager and Lead Author	National DFFE Appeals Directorate
2020	Two Integrated Social & Ecological Screening Study to assess the suitability of two sites for the development of a Seawater Desalination Facility (Reverse Osmosis) and associated infrastructure	Project Reviewer and Author	iX Engineers (Pty) Ltd
2020	Amendment to the Environmental Authorisations for the Development of the Kenhardt PV 1, PV 2 and PV 3 Solar Energy Facilities near Kenhardt, Northern Cape Province	Project Manager	Scatec Solar SA 163 (PTY) Ltd
2019 – 2021	Environmental Compliance and Performance Improvement for Foundries: Phase 1	Project Team Member	NFTN and NCPC
2019	Equator Principles Review of the Final EIA Report for the proposed Bulk Liquid Storage and Handling Facility in Zone 8 of the Coega IDZ, Port of Ngqura	Project Manager	Oiltanking Grindrod Calulo (PTY) Ltd
2019	Three Basic Assessment Processes: Proposed development of three Distribution Lines and electrical grid infrastructure to connect to the proposed Sutherland WEF, Sutherland 2 WEF and Rietrug WEF to the National Grid, near Sutherland in the Northern and Western Cape	Co-Project Manager	South Africa Mainstream Renewable Power Developments (Pty) Ltd

Date	Project Description	Role	Client
2019	Three Applications for Substantive Amendment to the Environmental Authorisations for the proposed Sutherland WEF, Sutherland 2 WEF and Rietrug WEF, near Sutherland in the Northern and Western Cape	Project Team Member	South Africa Mainstream Renewable Power Developments (Pty) Ltd
2019	Three Basic Assessment Processes for the proposed development of three 100 MW Solar PV Facilities (Kenhardt PV 4, PV 5, and PV 6) and associated Electricity Grid Infrastructure on the remaining extent of Onder Rugzeer Farm 168, north-east of Kenhardt, Northern Cape.	Project Advisor and Reviewer	Scatec Solar SA 163 (PTY) Ltd
2019	Notification of Environmental Authorisation Process for the Proposed Construction, Operation and Decommissioning of a Seawater Reverse Osmosis Plant and Associated Infrastructure at Tongaat on the KwaZulu-Natal North Coast.	Project Manager	Umgeni Water Amanzi
2018	Three Basic Assessment Processes for the proposed development of three transmission Lines and three 115 MW Solar PV Facilities (Vryburg PV 1, PV 2, and PV 3) near Vryburg, North-West.	Project Advisor and Mentor	Veroniva (Pty) Ltd; and ABO Wind renewable energies (Pty) Ltd
2017 – 2019	Strategic Environmental Assessment (SEA) for a Phased Gas Pipeline Network for South Africa	Project Manager	National DEA, DOE, DPE, Transnet, iGas and Eskom
2017 – 2019	Strategic Environmental Assessment (SEA) for the expansion of Electricity Grid Infrastructure (EGI) for South Africa	Project Manager	National DEA, DOE, DPE, Transnet, iGas and Eskom
2017	Application for the non-substantive Amendment to the Environmental Authorisation for the proposed Bulk Liquid Storage and Handling Facility at Maydon Wharf, Port of Durban, KwaZulu-Natal	Project Manager	Oiltanking Grindrod Calulo (PTY) Ltd
2017	Notification of the outcome of the Appeal Processes and Re- Issued EAs for the three 75 MW Solar PV Facilities (Kenhardt PV 1, PV 2, and PV 3) and three transmission Lines and electrical infrastructure (i.e. Kenhardt PV 1 – Transmission Line, Kenhardt PV 2 – Transmission Line, and Kenhardt PV 3 – Transmission Line), north-east of Kenhardt, Northern Cape.	Project Manager	Scatec Solar SA 163 (PTY) Ltd
2016 - 2017	Basic Assessment Processes: Proposed development of three Distribution Lines and electrical grid infrastructure to connect to the proposed Sutherland WEF, Sutherland 2 WEF and Rietrug WEF to the National Grid, near Sutherland in the Northern and Western Cape	Project Manager	South Africa Mainstream Renewable Power Developments (Pty) Ltd
2016 - 2017	Screening Assessment for the proposed storage of Dangerous Goods at an existing Storage Terminal at Maydon Wharf, Port of Durban, KwaZulu-Natal	Project Manager	Oiltanking Grindrod Calulo Terminals (PTY) Ltd
2016	Application for the non-substantive Amendment to the Environmental Authorisation for the proposed Bulk Liquid Storage and Handling Facility in Zone 8 of the Coega IDZ, Port of Ngqura	Project Manager	Oiltanking Grindrod Calulo (PTY) Ltd
2016	Application for the non-substantive Amendment to the Environmental Authorisation for the proposed Victoria West Renewable Energy Facility, Northern Cape	Project Manager	South Africa Mainstream Renewable Power Developments (Pty) Ltd
2016	Scoping and EIA Process: Proposed Development of the Teekloof WEF, near Victoria West, Northern Cape.	Project Assistant	South Africa Mainstream Renewable Power Developments (Pty) Ltd
2016	Scoping and EIA Process: Proposed Development of the Platberg WEF, near Victoria West, Northern Cape.	Project Assistant	South Africa Mainstream Renewable Power Developments (Pty) Ltd
2016	Appeal Processes for the three 75 MW Solar PV Facilities (Kenhardt PV 1, PV 2, and PV 3) and three transmission Lines and electrical infrastructure (i.e. Kenhardt PV 1 – Transmission Line, Kenhardt PV 2 – Transmission Line, and	Project Consultant	Scatec Solar SA 163 (PTY) Ltd

Date	Project Description	Role	Client
	Kenhardt PV 3 – Transmission Line), north-east of Kenhardt, Northern Cape.		
2015 – ongoing	Environmental Management Plan for the Proposed Construction of a Bulk Liquid Storage and Handling Facility in the Port of Cape Town, Western Cape	Project Manager	Oiltanking Grindrod Calulo Terminals (PTY) Ltd
2015 – 2016	Basic Assessment Process for the Proposed development of three Transmission Lines and electrical infrastructure to connect to the proposed 75 MW Solar PV Facilities (Kenhardt PV 1, PV 2, and PV 3) on the remaining extent of Onder Rugzeer Farm 168, and the remaining extent of Portion 3 of Gemsbok Bult Farm 120, north-east of Kenhardt, Northern Cape.	Project Manager	Scatec Solar SA 163 (PTY) Ltd
2015 – 2016	Scoping and EIA Process for the Proposed development of three 75 MW Solar PV Facilities (Kenhardt PV 1, PV 2, and PV 3) on the remaining extent of Onder Rugzeer Farm 168, north-east of Kenhardt, Northern Cape.	Project Manager	Scatec Solar SA 163 (PTY) Ltd
2015 – 2016	EIA for a Gas-To-Power project and associated infrastructure, forming part of the proposed Uyekraal Gas-to- Power Development, Saldanha Bay, Western Cape	Project Manager	Mulilo Thermal Developments
2015 - 2016	Environmental Impact Assessment Process for the Proposed Construction, Operation and Decommissioning of a Seawater Reverse Osmosis Plant and Associated Infrastructure at Tongaat and Lovu on the KwaZulu-Natal North Coast and South Coast	Project Assistant	Umgeni Water Amanzi
2015	Public Participation Process for the Application for non- substantive Amendment to the Environmental Authorisation for the proposed Landside Structures and Infrastructure to the Bulk Liquid Storage and Handling Facility in the Port of Ngqura	Project Manager	Transnet Capital Projects
2014 – 2016	Basic Assessment for the Proposed Decommissioning and Upgrade of a Bulk Liquid Storage and Handling Facility at Maydon Wharf, Port of Durban, KwaZulu-Natal	Project Manager	Oiltanking Grindrod Calulo Terminals (PTY) Ltd
2013 – 2016	Basic Assessment for the decommissioning of unused infrastructure at the Port of Ngqura	Project Manager	Transnet Capital Projects
2013 – 2014	Environmental Impact Assessment for the Provision of Marine Infrastructure, including a General Cargo Berth and Liquid Bulk Berths at the Port of Ngqura	Project Manager	Transnet Capital Projects
2012 - 2014	Environmental Impact Assessment for the proposed Manganese Export Terminal in Zones 8, 9 and 11 of the Coega IDZ, including the Port of Ngqura, and surrounding area	Project Assistant	Hatch Africa (PTY) Ltd c/o Transnet
2012 - 2014	Basic Assessment for the Provision of Landside Structures and Infrastructure to the Bulk Liquid Storage and Handling Facility in the Port of Ngqura	Project Manager	Eastern Cape Infrastructure Joint Venture c/o Transnet Capital Projects
2011 - 2014	Environmental Impact Assessment for the proposed Bulk Liquid Storage and Handling Facility in Zone 8 of the Coega IDZ, Port of Ngqura	Project Manager	Oiltanking Grindrod Calulo (PTY) Ltd
2010 – 2011	The Repair and Rehabilitation of the Umzinto River Bridge Number 823 on the South Coast of KwaZulu-Natal	Environmental Control Officer	KwaZulu-Natal Department of Transport
2010 – 2011	The Construction of the Kwahlongwa Bridge Number 3257 over the Kwa-Malukaka River on D297 near Umzumbe, South Coast of KwaZulu-Natal	Environmental Control Officer	KwaZulu-Natal Department of Transport
2010 – 2011	The Construction of a bridge and approach roads across the Indaka River at Eludimbi, within the Msinga Local Municipality, KwaZulu-Natal	Environmental Control Officer	KwaZulu-Natal Department of Transport
2010 – 2011	The Extension of the Lion Park Pipeline along the P566 and D2173 in the Manyavu area, KwaZulu-Natal	Environmental Control Officer	Umgeni Water

DateProject DescriptionRoleClient2010 - 2011The Construction of a bridge and approach roads across the Tugela River at Thulwane, within the Nkandla Local Municipality, KwaZulu-NatalEnvironmental Control OfficerKwaZulu-Natal2010 - 2011The Construction of a bridge and approach roads across the Mona River at Nqolotshe, within the Hlabisa and Nongoma Local Municipalities, KwaZulu-NatalEnvironmental Control OfficerKwaZulu-Natal Department of Transport2010 - 2011The Construction of the Mdloti River Bridge (Northbound) on the R102, within the eThekwini Municipality, KwaZulu-Natal.Environmental Control OfficerKwaZulu-Natal Department of Transport2010 - 2011The Upgrade of the R102 from the Duffs Road Interchange to King Shaka International Airport, within the eThekwini Municipality, KwaZulu-Natal.Environmental Control OfficerKwaZulu-Natal Department of Transport2010 - 2011The Construction of the P701 Provincial Road from Ulundi to Emvironmental Impact Assessment for the construction of a bridge and approach roads across the Mona River at Hubbico. and Nongoma Local Impact Assessment for the construction of a bridge and approach roads across the Mona River at Hubbico. and Nongoma Local Approach roads across the Mona River at Hubbico. and Nongoma Local Approach roads across the Mona River at Hubbico. and Nongoma Local Approach roads across the Mona River at Hubbico. and Nongoma Local Approach roads across the Mona River at Hubbico. and Nongoma Local Approach roads across the Mona River at Hubbico. and Nongoma Local Approach roads across the Mona River at Hubbico. Approach roads across the Mona River at Hubbico. Approach roads across the Mona River at Hubbico. Approach roa	_			
2010 - 2011The Construction of a bridge and approach roads across the Tugela River at Thulwane, within the Nkandla Local Municipality, KwaZulu-NatalEnvironmental Control OfficerKwaZulu-Natal2010 - 2011The Construction of a bridge and approach roads across the Mona River at Nqolotshe, within the Hlabisa and Nongoma Local Municipalities, KwaZulu-NatalEnvironmental Control OfficerKwaZulu-Natal2010 - 2011The Construction of the Mdloti River Bridge (Northbound) on the R102, within the eThekwini Municipality, KwaZulu-Natal.Environmental Control OfficerKwaZulu-Natal2010 - 2011The Upgrade of the R102 from the Duffs Road Interchange to King Shaka International Airport, within the eThekwini Municipality, KwaZulu-Natal.Environmental Control OfficerKwaZulu-Natal Department of Transport2010 - 2011The Construction of the P701 Provincial Road from Ulundi to Empangeni, KwaZulu-NatalEnvironmental Control OfficerKwaZulu-Natal Department of Transport2010Environmental Impact Assessment for the construction of a bridge and approach roads across the Mona River at Ngalethae, within the approach roads across the Mona River at Ngalethae, within the theliabing and Nongoma Local Municipality, KwaZulu-NatalProject AssistantKwaZulu-Natal Department of Transport	Date	Project Description	Role	Client
2010 - 2011The Construction of a bridge and approach roads across the Tugela River at Thulwane, within the Nkandla Local Municipality, KwaZulu-NatalEnvironmental Control OfficerKwaZulu-Natal Department of Transport2010 - 2011The Construction of a bridge and approach roads across the Mona River at Nqolotshe, within the Hlabisa and Nongoma Local Municipalities, KwaZulu-NatalEnvironmental Control OfficerKwaZulu-Natal2010 - 2011The Construction of the Mdloti River Bridge (Northbound) on the R102, within the eThekwini Municipality, KwaZulu-Natal.Environmental Control OfficerKwaZulu-Natal2010 - 2011The Upgrade of the R102 from the Duffs Road Interchange to King Shaka International Airport, within the eThekwini Municipality, KwaZulu-Natal.Environmental Control OfficerKwaZulu-Natal Department of Transport2010 - 2011The Construction of the P701 Provincial Road from Ulundi to Empangeni, KwaZulu-NatalEnvironmental Control OfficerKwaZulu-Natal Department of Transport2010Environmental Impact Assessment for the construction of a bridge and approach roads across the Mona River at Nadethe within the tellabica and hong and approach roads across the Mona River at Nadethe within the tellabicaProject AssistantKwaZulu-Natal Department of Transport				
2010 – 2011 The Construction of a bridge and approach roads across the Tugela River at Thulwane, within the Nkandla Local Municipality, KwaZulu-Natal Officer Department of Transport 2010 – 2011 The Construction of a bridge and approach roads across the Mona River at Nqolotshe, within the Hlabisa and Nongoma Local Municipalities, KwaZulu-Natal Environmental Control KwaZulu-Natal 2010 – 2011 The Construction of the Mdloti River Bridge (Northbound) on the R102, within the eThekwini Municipality, KwaZulu-Natal. Environmental Control KwaZulu-Natal 2010 – 2011 The Upgrade of the R102 from the Duffs Road Interchange to King Shaka International Airport, within the eThekwini Municipality, KwaZulu-Natal. Environmental Control KwaZulu-Natal 2010 – 2011 The Construction of the P701 Provincial Road from Ulundi to Empangeni, KwaZulu-Natal. Environmental Control KwaZulu-Natal 2010 – 2011 The Construction of the P701 Provincial Road from Ulundi to Empangeni, KwaZulu-Natal Environmental Control KwaZulu-Natal 2010 Environmental Impact Assessment for the construction of a bridge and approach roads across the Mona River at Nacletaba withing the Hlaping and Nagarame Local Project Assistant KwaZulu-Natal				
Tugela River at Thulwane, within the Nkandla Local Municipality, KwaZulu-NatalOfficerDepartment of Transport2010 - 2011The Construction of a bridge and approach roads across the Mona River at Nqolotshe, within the Hlabisa and Nongoma Local Municipalities, KwaZulu-NatalEnvironmental Control OfficerKwaZulu-Natal2010 - 2011The Construction of the Mdloti River Bridge (Northbound) on the R102, within the eThekwini Municipality, KwaZulu-Natal.Environmental Control OfficerKwaZulu-Natal2010 - 2011The Upgrade of the R102 from the Duffs Road Interchange to King Shaka International Airport, within the eThekwini Municipality, KwaZulu-Natal.Environmental Control OfficerKwaZulu-Natal Department of Transport2010 - 2011The Construction of the P701 Provincial Road from Ulundi to Empangeni, KwaZulu-NatalEnvironmental Control OfficerKwaZulu-Natal Department of Transport2010Environmental Impact Assessment for the construction of a bridge and approach roads across the Mona River at NaglatabaProject AssistantKwaZulu-Natal Department of Transport	2010 - 2011	The Construction of a bridge and approach roads across the	Environmental Control	KwaZulu-Natal
Municipality, KwaZulu-NatalEnvironmental ControlKwaZulu-Natal2010 - 2011The Construction of a bridge and approach roads across the Mona River at Nqolotshe, within the Hlabisa and Nongoma Local Municipalities, KwaZulu-NatalEnvironmental ControlKwaZulu-Natal2010 - 2011The Construction of the Mdloti River Bridge (Northbound) on the R102, within the eThekwini Municipality, KwaZulu-Natal.Environmental ControlKwaZulu-Natal2010 - 2011The Upgrade of the R102 from the Duffs Road Interchange to King Shaka International Airport, within the eThekwini Municipality, KwaZulu-Natal.Environmental ControlKwaZulu-Natal Department of Transport2010 - 2011The Construction of the P701 Provincial Road from Ulundi to Empangeni, KwaZulu-NatalEnvironmental Control OfficerKwaZulu-Natal Department of Transport2010Environmental Impact Assessment for the construction of a bridge and approach roads across the Mona River at NagletabaProject AssistantKwaZulu-Natal Department of Transport		Tugela River at Thulwane, within the Nkandla Local	Officer	Department of Transport
2010 - 2011The Construction of a bridge and approach roads across the Mona River at Nqolotshe, within the Hlabisa and Nongoma Local Municipalities, KwaZulu-NatalEnvironmental Control OfficerKwaZulu-Natal2010 - 2011The Construction of the Mdloti River Bridge (Northbound) on the R102, within the eThekwini Municipality, KwaZulu-Natal.Environmental Control OfficerKwaZulu-Natal2010 - 2011The Upgrade of the R102 from the Duffs Road Interchange to King Shaka International Airport, within the eThekwini Municipality, KwaZulu-Natal.Environmental Control OfficerKwaZulu-Natal Department of Transport2010 - 2011The Construction of the P701 Provincial Road from Ulundi to Empangeni, KwaZulu-NatalEnvironmental Control OfficerKwaZulu-Natal Department of Transport2010Environmental Impact Assessment for the construction of a bridge and approach roads across the Mona River at NagletabaProject AssistantKwaZulu-Natal Department of Transport		Municipality, KwaZulu-Natal		
Mona River at Nqolotshe, within the Hlabisa and Nongoma Local Municipalities, KwaZulu-NatalOfficerDepartment of Transport2010 - 2011The Construction of the Mdloti River Bridge (Northbound) on the R102, within the eThekwini Municipality, KwaZulu-Natal.Environmental Control OfficerKwaZulu-Natal Department of Transport2010 - 2011The Upgrade of the R102 from the Duffs Road Interchange to King Shaka International Airport, within the eThekwini Municipality, KwaZulu-Natal.Environmental Control OfficerKwaZulu-Natal Department of Transport2010 - 2011The Construction of the P701 Provincial Road from Ulundi to Empangeni, KwaZulu-NatalEnvironmental Control OfficerKwaZulu-Natal Department of Transport2010Environmental Impact Assessment for the construction of a bridge and approach roads across the Mona River at NagletabaProject AssistantKwaZulu-Natal Department of Transport	2010 – 2011	The Construction of a bridge and approach roads across the	Environmental Control	KwaZulu-Natal
Local Municipalities, KwaZulu-Natal 2010 – 2011 The Construction of the Mdloti River Bridge (Northbound) on the R102, within the eThekwini Municipality, KwaZulu-Natal. Environmental Control Officer KwaZulu-Natal Department of Transport 2010 – 2011 The Upgrade of the R102 from the Duffs Road Interchange to King Shaka International Airport, within the eThekwini Municipality, KwaZulu-Natal. Environmental Control Officer KwaZulu-Natal 2010 – 2011 The Construction of the P701 Provincial Road from Ulundi to Empangeni, KwaZulu-Natal Environmental Control Officer KwaZulu-Natal 2010 Environmental Impact Assessment for the construction of a bridge and approach roads across the Mona River at Nagletaba Project Assistant KwaZulu-Natal		Mona River at Nqolotshe, within the Hlabisa and Nongoma	Officer	Department of Transport
2010 – 2011 The Construction of the Mdloti River Bridge (Northbound) on the R102, within the eThekwini Municipality, KwaZulu-Natal. Environmental Control Officer KwaZulu-Natal Department of Transport 2010 – 2011 The Upgrade of the R102 from the Duffs Road Interchange to King Shaka International Airport, within the eThekwini Municipality, KwaZulu-Natal. Environmental Control Officer KwaZulu-Natal Department of Transport 2010 – 2011 The Construction of the P701 Provincial Road from Ulundi to Empangeni, KwaZulu-Natal Environmental Control Officer KwaZulu-Natal Department of Transport 2010 Environmental Impact Assessment for the construction of a bridge and approach roads across the Mona River at Nagletaba Project Assistant KwaZulu-Natal Department of Transport		Local Municipalities, KwaZulu-Natal		
the R102, within the eThekwini Municipality, KwaZulu-Natal. Officer Department of Transport 2010 - 2011 The Upgrade of the R102 from the Duffs Road Interchange to King Shaka International Airport, within the eThekwini Municipality, KwaZulu-Natal. Environmental Control KwaZulu-Natal 2010 - 2011 The Construction of the P701 Provincial Road from Ulundi to Empangeni, KwaZulu-Natal Environmental Control KwaZulu-Natal 2010 Environmental Impact Assessment for the construction of a bridge and approach roads across the Mona River at Nagletaba within the Hlabian and Nagarama Logal Project Assistant KwaZulu-Natal	2010 – 2011	The Construction of the Mdloti River Bridge (Northbound) on	Environmental Control	KwaZulu-Natal
2010 – 2011 The Upgrade of the R102 from the Duffs Road Interchange to King Shaka International Airport, within the eThekwini Municipality, KwaZulu-Natal. Environmental Control KwaZulu-Natal 2010 – 2011 The Construction of the P701 Provincial Road from Ulundi to Empangeni, KwaZulu-Natal Environmental Control KwaZulu-Natal 2010 Environmental Impact Assessment for the construction of a bridge and approach roads across the Mona River at Nagletabe, within, the Hlabiac, and Nagaema, Logal Project Assistant KwaZulu-Natal		the R102, within the eThekwini Municipality, KwaZulu-Natal.	Officer	Department of Transport
2010 – 2011 The Opgrade of the R102 from the Duns Road interchange to King Shaka International Airport, within the eThekwini Municipality, KwaZulu-Natal. Environmental Control Officer KwaZulu-Natal Department of Transport 2010 – 2011 The Construction of the P701 Provincial Road from Ulundi to Empangeni, KwaZulu-Natal Environmental Control Officer KwaZulu-Natal 2010 Environmental Impact Assessment for the construction of a bridge and approach roads across the Mona River at Nagletabae, within, the Hlabing, and Nagagemen Logal Project Assistant KwaZulu-Natal Department of Transport	2010 2011	The Unevertee of the D400 from the Duffe Deed Interchance	Faultana antal Cantral	Kuus Zulu Natal
to King Shaka International Airport, within the eThekwini Municipality, KwaZulu-Natal. Officer Department of Transport 2010 – 2011 The Construction of the P701 Provincial Road from Ulundi to Empangeni, KwaZulu-Natal Environmental Control Officer KwaZulu-Natal 2010 Environmental Impact Assessment for the construction of a bridge and approach roads across the Mona River at Nagletabae Project Assistant KwaZulu-Natal	2010 - 2011	The Upgrade of the R102 from the Duffs Road Interchange	Environmental Control	Kwazulu-Natal
Municipality, KwaZulu-Natal. Municipality, KwaZulu-Natal. 2010 – 2011 The Construction of the P701 Provincial Road from Ulundi to Empangeni, KwaZulu-Natal Environmental Control Officer KwaZulu-Natal 2010 Environmental Impact Assessment for the construction of a bridge and approach roads across the Mona River at Nagletabae withing the Highing and Nagrame Logal Project Assistant KwaZulu-Natal		to King Shaka International Airport, within the eThekwini	Officer	Department of Transport
2010 – 2011 The Construction of the P701 Provincial Road from Ulundi to Empangeni, KwaZulu-Natal Environmental Control Officer KwaZulu-Natal 2010 Environmental Impact Assessment for the construction of a bridge and approach roads across the Mona River at Nagletabae Project Assistant KwaZulu-Natal		Municipality, KwaZulu-Natal.		
Empangeni, KwaZulu-Natal Officer Department of Transport 2010 Environmental Impact Assessment for the construction of a bridge and approach roads across the Mona River at Nagletabae within the Highing and Nagrame Logal Project Assistant KwaZulu-Natal	2010 – 2011	The Construction of the P701 Provincial Road from Ulundi to	Environmental Control	KwaZulu-Natal
2010 Environmental Impact Assessment for the construction of a Project Assistant KwaZulu-Natal Department of Transport		Empangeni, KwaZulu-Natal	Officer	Department of Transport
bridge and approach roads across the Mona River at Department of Transport	2010	Environmental Impact Assessment for the construction of a	Project Assistant	KwaZulu-Natal
Naclataba within the Hipping and Nangama Local		bridge and approach roads across the Mona River at		Department of Transport
I INVOIDISTIE, WILLITT LITE FILADISA ATU INVILGOTTA LOCAI		Ngolotshe, within the Hlabisa and Nongoma Local		•
Municipalities, KwaZulu-Natal		Municipalities, KwaZulu-Natal		

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

APPENDIX B: ROLES AND RESPONSIBILITIES

Responsible Person(s)	Role and Responsibilities
Developer's Project Manager (DPM)	Role The Project Developer is accountable for ensuring compliance with the EMPr and any conditions of approval from the competent authority (CA). Where required, an environmental control officer (ECO) must be contracted by the Project Developer to objectively monitor the implementation of the EMPr according to relevant environmental legislation, and the conditions of the environmental authorisation (EA). The Project Developer is further responsible for providing and giving mandate to enable the ECO to perform responsibilities, and he must ensure that the ECO is integrated as part of the project team while remaining independent.
	 <u>Responsibilities</u> Be fully conversant with the conditions of the EA; Ensure that all stipulations within the EMPr are communicated and adhered to by the Developer and its Contractor(s); Issuing of site instructions to the Contractor for corrective actions required; Monitor the implementation of the EMPr throughout the project by means of site inspections and meetings. Overall management of the project and EMPr implementation; and Ensure that periodic environmental performance audits are undertaken on the project implementation.
Developer Site Supervisor (DSS)	Role The DSS reports directly to the DPM, oversees site works, liaises with the contractor(s) and the ECO. The DSS is responsible for the day to day implementation of the EMPr and for ensuring the compliance of all contractors with the conditions and requirements stipulated in the EMPr.
	 <u>Responsibilities</u> Ensure that all contractors identify a contractor's Environmental Officer (cEO); Must be fully conversant with the conditions of the EA. Oversees site works, liaison with Contractor, DPM and ECO; Must ensure that all landowners have the relevant contact details of the site staff, ECO and cEO; Issuing of site instructions to the Contractor for corrective actions required; Will issue all non-compliances to contractors; and Ratify the Monthly Environmental Report.
Environmental Control Officer (ECO)	Role The ECO should have appropriate training and experience in the implementation of environmental management specifications. The primary role of the ECO is to act as an independent quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts. In this respect, the ECO is to conduct periodic site inspections, attend regular site meetings, pre-empt problems

Responsible Person(s)	Role and Responsibilities
	and suggest mitigation and be available to advise on incidental issues that arise. The ECO is also required to conduct compliance audits, verifying the monitoring reports submitted by the cEO. The ECO provides feedback to the DSS and Project Manager regarding all environmental matters. The Contractor, cEO and dEO are answerable to the Environmental Control Officer for non-compliance with the Performance Specifications as set out in the EA and EMPr.
	The ECO provides feedback to the DSS and Project Manager, who in turn reports back to the Contractor and potential and Registered Interested &Affected Parties' (RI&AP's), as required. Issues of non-compliance raised by the ECO must be taken up by the Project Manager, and resolved with the Contractor as per the conditions of his contract. Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a variation, not allowed for in the Performance Specification) must be endorsed by the Project Manager. The ECO must also, as specified by the EA, report to the relevant CA as and when required.
	 Responsibilities The responsibilities of the ECO will include the following: Be aware of the findings and conclusions of all EA related to the development; Be familiar with the recommendations and mitigation measures of this EMPr; Be conversant with relevant environmental legislation, policies and procedures, and ensure compliance with them; Undertake regular and comprehensive site inspections / audits of the construction site according to the generic EMPr and applicable licenses in order to monitor compliance as required; Educate the construction team about the management measures contained in the EMPr and environmental licenses; Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective; Monitoring the performance of the Contractors and ensuring compliance with the EMPr and associated Method Statements;
	 In consultation with the Developer Site Supervisor order the removal of person(s) and/or equipment which are in contravention of the specifications of the EMPr and/or environmental licenses; Liaison between the DPM, Contractors, authorities and other lead stakeholders on all environmental concerns; Compile a regular environmental audit report highlighting any non-compliance issues as well as satisfactory or exceptional compliance with the EMPr; Validating the regular site inspection reports, which are to be prepared by the contractor Environmental Officer (cEO); Checking the cEO's record of environmental incidents (spills, impacts, legal transgressions etc.) as well as corrective and preventive actions taken; Checking the cEO's public complaints register in which all complaints are recorded, as well as action taken;
	 Assisting in the resolution of conflicts; Facilitate training for all personnel on the site – this may range from carrying out the training, to reviewing the training programmes of the Contractor;

Responsible Person(s)	Role and Responsibilities
	 In case of non-compliances, the ECO must first communicate this to the Senior Site Supervisor, who has the power to ensure this matter is addressed. Should no action or insufficient action be taken, the ECO may report this matter to the authorities as non-compliance; Maintenance, update and review of the EMPr; Communication of all modifications to the EMPr to the relevant stakeholders.
developer Environmental Officer (dEO)	Role The dEOs will report to the Project Manager and are responsible for implementation of the EMPr, environmental monitoring and reporting, providing environmental input to the Project Manager and Contractor's Manager, liaising with contractors and the landowners as well as a range of environmental coordination responsibilities. Responsibilities
	 Be fully conversant with the EMPr; Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures; Ensure that all stipulations within the EMPr are communicated and adhered to by the Employees, Contractor(s); Confine the development site to the demarcated area; Conduct environmental internal audits with regards to EMPr and authorisation compliance (on cEO); Assist the contractors in addressing environmental challenges on site; Assist in incident management: Reporting environmental incidents to developer and ensuring that corrective action is taken, and lessons learnt shared; Assist the contractor in investigating environmental incidents and compile investigation reports; Follow-up on pre-warnings, defects, non-conformance reports; Measure and communicate environmental performance to the Contractor; Conduct environmental awareness training on site together with ECO and cEO; Ensure that the necessary legal permits and / or licenses are in place and up to date; Acting as Developer's Environmental Representative on site and work together with the ECO and contractor.
Contractor	Role The Contractor appoints the cEO and has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the EMPr and that Method Statements are implemented as described. External contractors must ensure compliance with this EMPr while performing the onsite activities as per their contract with the Project Developer. The contractors are required, where specified, to provide Method Statements setting out in detail how the impact management actions contained in the EMPr will be implemented during the development or expansion of substation infrastructure for the transmission and distribution of electricity activities.

Responsible Person(s)	Role and Responsibilities
	 Responsibilities project delivery and quality control for the development services as per appointment; employ a suitably qualified person to monitor and report to the Project Developer's appointed person on the daily activities on-site during the construction period; ensure that safe, environmentally acceptable working methods and practices are implemented and that equipment is properly operated and maintained, to facilitate proper access and enable any operation to be carried out safely; attend on site meeting(s) prior to the commencement of activities to confirm the procedure and designated activity zones; ensure that contractors' staff repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in EMPr, to the satisfaction of the ECO.
contractor Environmental Officer (cEO)	Role Each Contractor affected by the EMPr should appoint a cEO, who is responsible for the on-site implementation of the EMPr (or relevant sections of the EMPr). The Contractor's representative can be the site agent; site engineer; a dedicated environmental officer; or an independent consultant. The Contractor must ensure that the Contractor's Representative is suitably qualified to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the Environmental Control Officer and the public. As a minimum the cEO shall meet the following criteria:
	 Responsibilities Be on site throughout the duration of the project and be dedicated to the project; Ensure all their staff are aware of the environmental requirements, conditions and constraints with respect to all of their activities on site; Implementing the environmental conditions, guidelines and requirements as stipulated within the EA, EMPr and Method Statements; Attend the Environmental Site Meeting; Undertaking corrective actions where non-compliances are registered within the stipulated timeframes; Report back formally on the completion of corrective actions; Assist the ECO in maintaining all the site documentation; Prepare the site inspection reports and corrective action reports for submission to the ECO; Assist the ECO with the preparing of the monthly report; and Where more than one Contractor is undertaking work on site, each company appointed as a Contractor will appoint a cEO representing that company.

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

APPENDIX C: CHANCE FOSSIL FIND PROTOCOL FOR PALAEONTOLOGICAL RESOURCES

CHANCE FOSSIL FINDS	SIL FINDS PROTOCOL: Proposed Kudu Solar PV Facilities and Associated Infrastructure near De Aar				
Province & region:	Northern Cape: Pixley Ka Seme District				
Responsible Heritage	SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Phone: +27 (0)21 46				
Resources Agency	www.sahra.org.za).				
Rock unit(s)	Early to Middle Permian Tierberg and Waterford Formation (Ecca Group), Late Caenozoic calcrete hardpans, alluvium, aeolian sands, pan sedim				
Potential fossils	Trace fossil assemblages, petrified wood, microvertebrate remains within Ecca Group sediments. Potential for concentrations of mammalian fossil remains (bones, teeth, horncores), trace fossils, non-marine molluscs in association with calcrete Fossil mammal bones, teeth, horn cores, freshwater molluscs, plant material in Late Caenozoic alluvium and pan deposits.				
Environmental Control Officer (ECO) protocol	 Fossil mammal bones, teeth, horn cores, freshwater molluscs, plant material in Late Caenozoic alluvium and pan deposits. 1. Once alerted to fossil occurrence(s): alert site foreman, stop work in area immediately (<i>N.B.</i> safety first!), safeguard site with security tape / fen 2. Record key data while fossil remains are still <i>in situ</i>: Accurate geographic location – describe and mark on site map / 1: 50 000 map / satellite image / aerial photo Context – describe position of fossils within stratigraphy (rock layering), depth below surface Photograph fossil(s) <i>in situ</i> with scale, from different angles, including images showing context (<i>e.g.</i> rock layering) 3. If feasible to leave fossils <i>in situ</i>: Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation Ensure fossil site remains safeguarded until clearance is given by the Heritage Resources Agency for work to resume 3. If net feasible to leave fossils in setu: Carefully remove fossils against a plain, level background, with scale Carefully wrap fossils in several layers of newspaper / tissue paper / plastic bags Safeguard fossils together with locality and collection data (including collector and oby a palaeontologist Alert Heritage Resources Agency and project jealaeontologist (if any) who will advise 				
	4. IT required by Heritage Resources Agency, ensure that	t a suitably-qualified specialist palaeontologist is appointed as soon as possible by the d			
	5. Implement any further mitigation measures proposed to	by the palaeontologist and Heritage Resources Agency			
Specialist palaeontologist	Record, describe and judiciously sample fossil remains together with relevant contextual data (stratigraphy / sedimentology / taphonomy). E repository (<i>e.g.</i> museum / university / Council for Geoscience collection) together with full collection data. Submit Palaeontological Mitigation to best international practice for palaeontological fieldwork and Heritage Resources Agency minimum standards.				
	· · · · · · · · · · · · · · · · · · ·				

62 4502. Fax: +27 (0)21 462 4509. Web:

nents, surface gravels (Kalahari Group)

te hardpans.

nce / sand bags if necessary.

ntary matrix (e.g. entire block of fossiliferous

date) in a box in a safe place for examination

ise on any necessary mitigation

eveloper.

ure that fossils are curated in an approved port to Heritage Resources Agency. Adhere

APPENDIX D: PRE-APPROVED GENERIC EMPR TEMPLATE FOR SUBSTATION INFRASTRUCTURE (GN 435)

SECTION 5: IMPACT MANAGEMENT OUTCOMES AND IMPACT MANAGEMENT ACTIONS

This section provides a pre-approved generic EMPr template with aspects that are common to the development of substation infrastructure for the transmission and distribution of electricity. There is a list of aspects identified for the development or expansion of substation infrastructure for the transmission and distribution of electricity, and for each aspect a set of prescribed impact management outcomes and associated impact management actions have been identified. Holders of EAs are responsible to ensure the implementation of these outcomes and actions for all projects as a minimum requirement, in order to mitigate the impact of such aspects identified for the development or expansion of substation infrastructure for the transmission and distribution of electricity.

The template provided below is to be completed by providing the information under each heading for each environmental impact management action.

The completed template must be signed and dated on each page by both the contractor and the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as Appendix 1. Each method statement must also be duly signed and dated on each page by the contactor and the holder of the EA. This template, once signed and dated, is legally binding. The holder of the EA will remain responsible for its implementation.

5.1. Environmental awareness training

Imp	mpact management outcome: All onsite staff are aware and understands the individual responsibilities in terms of this EMPr.						
Impact Management Actions		Implementation Monitoring					
		Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of
		person	implementation	implementation	person		compliance
-	All staff must receive environmental awareness training prior to commencement of the activities;						
-	The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course;						
-	Refresher environmental awareness training is available as and when required;						
-	All staff are aware of the conditions and controls linked to the EA and within the EMPr and made aware of their individual roles and responsibilities						
	in achieving compliance with the EA and EMPr;						
-	The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a						
	minimum: a) Safety notifications; and b) No littering.						
-	Environmental awareness training must include as a minimum the following: a) Description of significant environmental impacts, actual or potential,						
	related to their work activities; b) Mitigation measures to be implemented when carrying out specific activities; c) Emergency preparedness and						
	response procedures; d) Emergency procedures; e) Procedures to be followed when working near or within sensitive areas; f) Wastewater						
	management procedures; g) Water usage and conservation; h) Solid waste management procedures; i) Sanitation procedures; j) Fire prevention;						
	and k) Disease prevention.						
-	A record of all environmental awareness training courses undertaken as part of the EMPr must be available;						
-	Educate workers on the dangers of open and/or unattended fires;						
-	A staff attendance register of all staff to have received environmental awareness training must be available.						
-	Course material must be available and presented in appropriate languages that all staff can understand.						

5.2. Site Establishment development

Impact management outcome: Impacts on the environment are minimised during site establishment and the development footprint are kept to demarcated development area.						
Impact Management Actions		Implementation Monitoring				
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of
	person	implementation	implementation	person		compliance
 A method statement must be provided by the contractor prior to any onsite activity that includes the layout of the construction camp in the form of a plan showing the location of key infrastructure and services (where applicable), including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous materials storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management; Location of camps must be within approved area to ensure that the site does not impact on sensitive areas identified in the environmental assessment or site walk through; Sites must be located where possible on previously disturbed areas; The camp must be fenced in accordance with Section 5.5: Fencing and gate installation; and The use of existing accommodation for contractor staff, where possible, is encouraged. 						

5.3. Access restricted areas Impact management outcome: Access to restricted areas prevented. Implementation Monitorin Impact Management Actions Responsible Method of Timeframe for Responsit implementation implementation person person Identification of access restricted areas is to be informed by the environmental assessment, site walk through and any _ additional areas identified during development; Erect, demarcate and maintain a temporary barrier with clear signage around the perimeter of any access restricted area, _ colour coding could be used if appropriate; and Unauthorised access and development related activity inside access restricted areas is prohibited.

5.4. Access roads

Impact management outcome: Minimise impact to the environment through the planned and restricted movement of vehicles on site.										
Impact Management Actions	Implementation	Implementation			Monitoring					
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of				
	person	implementation	implementation	person		compliance				
 An access agreement must be formalised and signed by the DPM, Contractor and landowner before commencing with the activities; 										
 All private roads used for access to the servitude must be maintained and upon completion of the works, be left in at least the original condition 										
 All contractors must be made aware of all these access routes. 										
 Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the contractor's expense; 										
 Maximum use of both existing servitudes and existing roads must be made to minimize further disturbance through the development of new roads; 										
 In circumstances where private roads must be used, the condition of the said roads must be recorded in accordance with section 4.9: photographic record; prior to use and the condition thereof agreed by the landowner, the DPM, and the contractor; 										
 Access roads in flattish areas must follow fence lines and tree belts to avoid fragmentation of vegetated areas or croplands 										
 Access roads must only be developed on a pre-planned and approved roads. 										

5.5. Fencing and Gate installation

Impa	npact management outcome: Minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required.								
Impa	ct Management Actions	Implementation			Monitoring				
		Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of		
		person	implementation	implementation	person		compliance		
l –	Use existing gates provided to gain access to all parts of the area authorised for development, where possible;								
_	Existing and new gates to be recorded and documented in accordance with section 4.9: photographic record;								
_	All gates must be fitted with locks and be kept locked at all times during the development phase, unless otherwise agreed								
	with the landowner;								
_	At points where the line crosses a fence in which there is no suitable gate within the extent of the line servitude, on the								
	instruction of the DPM, a gate must be installed at the approval of the landowner;								
_	Care must be taken that the gates must be so erected that there is a gap of no more than 100 mm between the bottom								
	of the gate and the ground;								
-	Where gates are installed in jackal proof fencing, a suitable reinforced concrete sill must be provided beneath the gate;								
-	Original tension must be maintained in the fence wires;								
_	All gates installed in electrified fencing must be re-electrified;								
_	All demarcation fencing and barriers must be maintained in good working order for the duration of the development								
	activities;								
_	Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access								
	restricted areas, where applicable;								
_	Any temporary fencing to restrict the movement of live-stock must only be erected with the permission of the landowner.								
_	All fencing must be developed of high quality material bearing the SABS mark;								
-	The use of razor wire as fencing must be avoided;								
_	Fenced areas with gate access must remain locked after hours, during weekends and on holidays if staff is away from								
	site. Site security will be required at all times;								
-	On completion of the development phase all temporary fences are to be removed;								
-	The contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground								
	level but rather removed completely.								

ig		
ole	Frequency	Evidence of
		compliance

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

5.6. Water Supply Management

Impact management outcome: Undertake responsible water usage.									
Impact Management Actions				Monitoring					
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of			
	person	implementation	implementation	person		compliance			
 All abstraction points or bore holes must be registered with the DWS and suitable water meters installed to ensure that the abstracted volumes are measured on a daily basis; The Contractor must ensure the following: a. The vehicle abstracting water from a river does not enter or cross it and does not operate from within the river; b. No damage occurs to the river bed or banks and that the abstraction of water does not entail stream diversion activities; and c. All reasonable measures to limit pollution or sedimentation of the downstream watercourse are implemented. Ensure water conservation is being practiced by: a. Minimising water use during cleaning of equipment; b. Undertaking regular audits of water systems; and c. Including a discussion on water usage and conservation during environmental awareness training. d. The use of grey water is encouraged. 									

5.7. Storm and wastewater management

Imp	Impact management outcome: Impacts to the environment caused by storm water and wastewater discharges during construction are avoided.										
Impact Management Actions					Monitoring	Monitoring					
		Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of				
		person	implementation	implementation	person		compliance				
-	Runoff from the cement/ concrete batching areas must be strictly controlled, and contaminated water must be collected,										
	stored and either treated or disposed of off-site, at a location approved by the project manager;										
-	All spillage of oil onto concrete surfaces must be controlled by the use of an approved absorbent material and the used absorbent material disposed of at an appropriate waste disposal facility;										
_	Natural storm water runoff not contaminated during the development and clean water can be discharged directly to watercourses and water bodies, subject to the Project Manager's approval and support by the ECO;										
-	Water that has been contaminated with suspended solids, such as soils and silt, may be released into watercourses or water bodies only once all suspended solids have been removed from the water by settling out these solids in settlement										
	ponds. The release of settled water back into the environment must be subject to the Project Manager's approval and support by the ECO.										

5.8. Solid and hazardous waste management

Impact mar	Impact management outcome: Wastes are appropriately stored, handled and safely disposed of at a recognised waste facility.									
Impact Mar	nagement Actions	Implementation			Monitoring					
		Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of			
		person	implementation	implementation	person		compliance			
– All me	easures regarding waste management must be undertaken using an integrated waste management approach;									
 Suffic 	ient, covered waste collection bins (scavenger and weatherproof) must be provided;									
 A suit 	tably positioned and clearly demarcated waste collection site must be identified and provided;									
 The w 	vaste collection site must be maintained in a clean and orderly manner;									
 Waste 	e must be segregated into separate bins and clearly marked for each waste type for recycling and safe disposal;									
– Staff	must be trained in waste segregation;									
 Bins r 	must be emptied regularly;									
– Gene	ral waste produced onsite must be disposed of at registered waste disposal sites/ recycling company;									
– Haza	rdous waste must be disposed of at a registered waste disposal site;									
 Certif 	icates of safe disposal for general, hazardous and recycled waste must be maintained.									

5.9. Protection of watercourses and estuaries

Impact management outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.										
Impact Management Actions	Implementation	Implementation			Monitoring					
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of				
	person	implementation	implementation	person		compliance				
 All watercourses must be protected from direct or indirect spills of pollutants such as solid waste, sewage, cement, oils, fuels, chemicals, aggregate tailings, wash and contaminated water or organic material resulting from the Contractor's activities; In the event of a spill, prompt action must be taken to clear the polluted or affected areas; Where possible, no development equipment must traverse any seasonal or permanent wetland No return flow into the estuaries must be allowed and no disturbance of the Estuarine functional Zone should occur; Development of permanent watercourse or estuary crossing must only be undertaken where no alternative access to tower position is available; There must not be any impact on the long term morphological dynamics of watercourses or estuaries; Existing crossing points must be favored over the creation of new crossings (including temporary access) 										

Impact management outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.										
Impact Management Actions	Implementation			Monitoring						
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of				
	person	implementation	implementation	person		compliance				
 When working in or near any watercourse or estuary, the following environmental controls and consideration must be taken: Water levels during the period of construction; No altering of the bed, banks, course or characteristics of a watercourse During the execution of the works, appropriate measures to prevent pollution and contamination of the riparian environment must be implemented e.g. including ensuring that construction equipment is well maintained; Where earthwork is being undertaken in close proximity to any watercourse, slopes must be stabilised using suitable materials, i.e. sandbags or geotextile fabric, to prevent sand and rock from entering the channel; and Appropriate rehabilitation and re-vegetation measures for the watercourse banks must be implemented timeously. In this regard, the banks should be appropriately and incrementally stabilised as soon as development allows. 										

5.10. Vegetation clearing

0.10	7. To: Vegetation oleaning									
Imp	Impact management outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.									
Imp	pact Management Actions	Implementation			Monitoring					
		Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of			
		person	implementation	implementation	person		compliance			
Ge	neral:									
-	Indigenous vegetation which does not interfere with the development must be left undisturbed;									
-	Protected or endangered species may occur on or near the development site. Special care should be taken not to damage such species;									
-	Search, rescue and replanting of all protected and endangered species likely to be damaged during project development must be identified by the relevant specialist and completed prior to any development or clearing;									
-	Permits for removal must be obtained from the relevant CA prior to the cutting or clearing of the affected species, and they must be filed;									
-	The Environmental Audit Report must confirm that all identified species have been rescued and replanted and that the location of replanting is compliant with conditions of approvals;									
-	Trees felled due to construction must be documented and form part of the Environmental Audit Report;									
-	Rivers and watercourses must be kept clear of felled trees, vegetation cuttings and debris;									
-	Only a registered pest control operator may apply herbicides on a commercial basis and commercial application must be									
	carried out under the supervision of a registered pest control operator, supervision of a registered pest control operator									
	or is appropriately trained;									
-	A daily register must be kept of all relevant details of herbicide usage;									
-	No herbicides must be used in estuaries;									
-	All protected species and sensitive vegetation not removed must be clearly marked and such areas fenced off in									
	accordance to Section 5.3: Access restricted areas.									
-	Alien invasive vegetation must be removed and disposed of at a licensed waste management facility.									

5.11. Protection of fauna

Imp	Impact management outcome: Disturbance to fauna is minimised.									
Imp	act Management Actions	Implementation			Monitoring					
		Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance			
-	No interference with livestock must occur without the landowner's written consent and with the landowner or a person representing the landowner being present;									
-	The breeding sites of raptors and other wild birds species must be taken into consideration during the planning of the development programme;									
-	Breeding sites must be kept intact and disturbance to breeding birds must be avoided. Special care must be taken where nestlings or fledglings are present;									
-	Special recommendations of the avian specialist must be adhered to at all times to prevent unnecessary disturbance of birds;									
-	No poaching must be tolerated under any circumstances. All animal dens in close proximity to the works areas must be marked as Access restricted areas;									
-	No deliberate or intentional killing of fauna is allowed;									
-	In areas where snakes are abundant, snake deterrents to be deployed on the pylons to prevent snakes climbing up,									
	being electrocuted and causing power outages; and									

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

Impact management outcome: Disturbance to fauna is minimised.									
Impact Management Actions	Implementation			Monitoring					
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of			
	person	implementation	implementation	person		compliance			
 No Threatened or Protected species (ToPs) and/or protected fauna as listed according NEMBA (Act No. 10 of 2004) and relevant provincial ordinances may be removed and/or relocated without appropriate authorisations/permits. 									

5.12. Protection of heritage resources

Impact management outcome: Impact to heritage resources is minimised.									
Impact Management Actions				Monitoring					
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of			
	person	implementation	implementation	person		compliance			
 Identify, demarcate and prevent impact to all known sensitive heritage features on site in accordance with the No-Go procedure in <i>Section 5.3: Access restricted areas</i>; Carry out general monitoring of excavations for potential fossils, artefacts and material of heritage importance; All work must cease immediately, if any human remains and/or other archaeological, palaeontological and historical material are uncovered. Such material, if exposed, must be reported to the nearest museum, archaeologist/ palaeontologist (or the South African Police Services), so that a systematic and professional investigation can be undertaken. Sufficient time must be allowed to remove/collect such material before development recommences. 									

5.13. Safety of the public

Impact management outcome: All precautions are taken to minimise the risk of injury, harm or complaints.								
Impact Management Actions		Implementation			Monitoring			
		Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of	
		person	implementation	implementation	person		compliance	
_	Identify fire hazards, demarcate and restrict public access to these areas as well as notify the local authority of any potential							
	threats e.g. large brush stockpiles, fuels etc.;							
_	All unattended open excavations must be adequately fenced or demarcated;							
-	Adequate protective measures must be implemented to prevent unauthorised access to and climbing of partly constructed							
	towers and protective scaffolding;							
-	Ensure structures vulnerable to high winds are secured;							
_	Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged.							

5.14. Sanitation

Impact management outcome: Clean and well maintained toilet facilities are available to all staff in an effort to minimise the risk of disease and impact to the environment.								
Impact Management Actions		Implementation			Monitoring			
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of		
	person	implementation	implementation	person		compliance		
 Mobile chemical toilets are installed onsite if no other ablution facilities are available; 								
- The use of ablution facilities and or mobile toilets must be used at all times and no indiscriminate use of the veld for the								
purposes of ablutions must be permitted under any circumstances;								
 Where mobile chemical toilets are required, the following must be ensured: 								
a) Toilets are located no closer than 100 m to any watercourse or water body;								
b) Toilets are secured to the ground to prevent them from toppling due to wind or any other cause;								
c) No spillage occurs when the toilets are cleaned or emptied and the contents are managed in accordance with the								
EMPr;								
d) Toilets have an external closing mechanism and are closed and secured from the outside when not in use to prevent								
toilet paper from being blown out;								
e) Toilets are emptied before long weekends and workers holidays, and must be locked after working hours;								
f) Toilets are serviced regularly and the ECO must inspect toilets to ensure compliance to health standards;								
 A copy of the waste disposal certificates must be maintained. 								

5.15. Prevention of disease

Impact Management outcome: All necessary precautions linked to the spread of disease are taken.								
Impact Management Actions		Implementation			Monitoring			
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of		
	person	implementation	implementation	person		compliance		
 Undertake environmentally-friendly pest control in the camp area; 								
 Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV AIDS; 								
 The Contractor must ensure that information posters on AIDS are displayed in the Contractor Camp area; 								
- Information and education relating to sexually transmitted diseases to be made available to both construction workers								
and local community, where applicable;								
ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

Impact Management outcome: All necessary precautions linked to the spread of disease are taken.									
Impact Management Actions Implementation				Monitoring					
	Responsible	Method of	Timeframe for	Responsible					
	person	implementation	implementation	person					
 Free condoms must be made available to all staff on site at central points; 									
 Medical support must be made available; 									
 Provide access to Voluntary HIV Testing and Counselling Services. 									

5.16. Emergency procedures

Impact management outcome: Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.								
Impact Management Actions				Monitoring				
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of		
	person	implementation	implementation	person		compliance		
 Compile an Emergency Response Action Plan (ERAP) prior to the commencement of the proposed project; The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation; All staff must be made aware of emergency procedures as part of environmental awareness training; The relevant local authority must be made aware of a fire as soon as it starts; In the event of emergency necessary mitigation measures to contain the spill or leak must be implemented (see <i>Hazardous Substances section 5.17</i>). 								

5.17. Hazardous substances

Impact management outcome: Safe storage, handling, use and disposal of hazardous substances.							
Impa	t Management Actions	Implementation			Monitoring		
		Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of
		person	implementation	implementation	person		compliance
-	The use and storage of hazardous substances to be minimised and non-hazardous and non-toxic alternatives substituted						
	where possible;						
_	All hazardous substances must be stored in suitable containers as defined in the Method Statement;						
_	Containers must be clearly marked to indicate contents, quantities and safety requirements;						
_	All storage areas must be bunded. The bunded area must be of sufficient capacity to contain a spill / leak from the stored						
	containers;						
-	Bunded areas to be suitably lined with a SABS approved liner;						
-	An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date on a continuous basis;						
_	All hazardous chemicals that will be used on site must have Material Safety Data Sheets (MSDS);						
_	All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet;						
_	Employees handling hazardous substances / materials must be aware of the potential impacts and follow appropriate						
	safety measures. Appropriate personal protective equipment must be made available;						
_	The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks						
	or in bowsers;						
-	The tanks/ bowsers must be situated on a smooth impermeable surface (concrete) with a permanent bund. The						
	impermeable lining must extend to the crest of the bund and the volume inside the bund must be 130% of the total capacity						
	of all the storage tanks/ bowsers (110% statutory requirement plus an allowance for rainfall);						
-	The floor of the bund must be sloped, draining to an oil separator;						
-	Provision must be made for refueling at the storage area by protecting the soil with an impermeable groundcover. Where						
	dispensing equipment is used, a drip tray must be used to ensure small spills are contained;						
-	All empty externally dirty drums must be stored on a drip tray or within a bunded area;						
-	No unauthorised access into the hazardous substances storage areas must be permitted;						
_	No smoking must be allowed within the vicinity of the hazardous storage areas;						
_	Adequate fire-fighting equipment must be made available at all hazardous storage areas;						
-	Where refueling away from the dedicated refueling station is required, a mobile refueling unit must be used. Appropriate						
	ground protection such as drip trays must be used;						
-	An appropriately sized spill kit kept onsite relevant to the scale of the activity/s involving the use of hazardous substance						
	must be available at all times;						
_	The responsible operator must have the required training to make use of the spill kit in emergency situations;						
_	An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken;						
_	In the event of a spill, contaminated soil must be collected in containers and stored in a central location and disposed of						
	according to the National Environmental Management: Waste Act 59 of 2008. Refer to Section 5.7 for procedures						
	concerning storm and wastewater management and 5.8 for solid and hazardous waste management.						

;	Frequency	Evidence of
		compliance

5.18. Workshop, equipment maintenance and storage

Impact management outcome: Soil, surface water and groundwater contamination is minimised.								
Impact Management Actions		Implementation			Monitoring			
		Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of	
		person	implementation	implementation	person		compliance	
 Where possible and practical all mainter 	enance of vehicles and equipment must take place in the workshop area;							
 During servicing of vehicles or equipment 	ent, especially where emergency repairs are effected outside the workshop							
area, a suitable drip tray must be used	to prevent spills onto the soil. The relevant local authority must be made aware							
of a fire as soon as it starts;								
 Leaking equipment must be repaired in 	nmediately or be removed from site to facilitate repair;							
 Workshop areas must be monitored for 	r oil and fuel spills;							
 Appropriately sized spill kit kept onsite 	relevant to the scale of the activity taking place must be available;							
 The workshop area must have a bunder 	ed concrete slab that is sloped to facilitate runoff into a collection sump or							
suitable oil / water separator where ma	intenance work on vehicles and equipment can be performed;							
 Water drainage from the workshop music 	st be contained and managed in accordance Section 5.7: Storm and							
wastewater management.	-							

5.19. Batching plants

Impa	Impact management outcome: Minimise spillages and contamination of soil, surface water and groundwater.								
Impa	act Management Actions	Implementation			Monitoring				
-	·	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance		
-	Concrete mixing must be carried out on an impermeable surface;								
_	Batching plants areas must be fitted with a containment facility for the collection of cement laden water.								
-	Dirty water from the batching plant must be contained to prevent soil and groundwater contamination								
-	Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains;								
-	A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted;								
-	Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility;								
-	Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site;								
-	Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to Section 5.20: Dust emissions)								
-	Any excess sand, stone and cement must be removed or reused from site on completion of construction period and disposed at a registered disposal facility;								
-	Temporary fencing must be erected around batching plants in accordance with Section 5.5: Fencing and gate installation.								

5.20. Dust emissions

Impact management outcome: Dust prevention measures are applied to minimise the generation of dust.								
Impact Management Actions	Implementation			Monitoring	Monitoring			
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of		
	person	implementation	implementation	person		compliance		
 Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO; 								
 Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be re- vegetated or stabilised as soon as is practically possible; 								
 Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present; 								
 During high wind conditions, the ECO must evaluate the situation and make recommendations as to whether dust- domains measures are adapted a substate working will appear alterative wind appear to an acceptable 								
level;	÷							
 Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind: 	f							
 Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of 								
the ECO;								
 Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas; 								
 Straw stabilisation must be applied at a rate of one bale/10 m² and harrowed into the top 100 mm of top material, for a completed earthworks; 	1							

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

Impact management outcome: Dust prevention measures are applied to minimise the generation of dust.								
Impact Management Actions	Implementation Monitoring							
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of		
	person	implementation	implementation	person		compliance		
 For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust. 								

5.21. Blasting

Impact management outcome: Impact to the environment is minimised through a safe blasting practice.								
Impact Management Actions	Implementation Monitor				ing			
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of		
	person	implementation	implementation	person		compliance		
 Any blasting activity must be conducted by a suitably licensed blasting contractor; and 								
 Notification of surrounding landowners, emergency services site personnel of blasting activity 24 hours prior to such 								
activity taking place on Site.								

5.22. Noise

Impact Management outcome: Prevent unnecessary noise to the environment by ensuring that noise from development activity is mitigated.									
Impact Management Actions	Implementation			Monitoring	Monitoring				
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of			
	person	implementation	implementation	person		compliance			
 The Contractor must keep noise level within acceptable limits, Restrict the use of sound amplification equipment for communication and emergency only; All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained; Any complaints received by the Contractor regarding noise must be recorded and communicated. Where possible or applicable, provide transport to and from the site on a daily basis for construction workers; Develop a Code of Conduct for the construction phase in terms of behaviour of construction staff. Operating hours as determined by the environmental authorisation are adhered to during the development phase. Where not defined, it must be ensured that development activities must still meet the impact management outcome related to noise management. 									

5.23. Fire prevention

Impact management outcome: Prevention of uncontrollable fires.								
Impact Management Actions		Implementation			Monitoring			
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of		
	person	implementation	implementation	person		compliance		
 Designate smoking areas where the fire hazard could be regarded as insignificant; 								
 Firefighting equipment must be available on all vehicles located on site; 								
 The local Fire Protection Agency (FPA) must be informed of construction activities; 								
 Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site; 								
 Two way swop of contact details between ECO and FPA. 								

5.24. Stockpiling and stockpile areas

Impact management outcome: Reduce erosion and sedimentation as a result of stockpiling.									
Impact Management Actions	Implementation	Implementation			Monitoring				
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of			
	person	implementation	implementation	person		compliance			
 All material that is excavated during the project development phase (either during piling (if required) or earthworks) 									
must be stored appropriately on site in order to minimise impacts to watercourses, watercourses and water bodies;									
 All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regula weeding and control methods; 									
 Topsoil stockpiles must not exceed 2 m in height; 									
- During periods of strong winds and heavy rain, the stockpiles must be covered with appropriate material (e.g. cloth,									
tarpaulin etc.);									
 Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material in order to prevent erosion of the material. 									

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

5.25. Civil works

Impact management outcome: Impact to the environment minimised during civil works to create the substation terrace.									
Impact Management Actions	Implementation Monitoring								
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of			
	person	implementation	implementation	person		compliance			
 Where terracing is required, topsoil must be collected and retained for the purpose of re-use later to rehabilitate disturbed areas not covered by yard stone; Areas to be rehabilitated include terrace embankments and areas outside the high voltage yards; Where required, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled; These areas can be stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly; Rehabilitation of the disturbed areas must be managed in accordance with <i>Section 5.35: Landscaping and rehabilitation</i>; All excess spoil generated during terracing activities must be disposed of in an appropriate manner and at a recognised landfill site; and Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes 									

5.26. Excavation of foundation, cable trenching and drainage systems

	······································								
Impa	mpact management outcome: No environmental degradation occurs as a result of excavation of foundation, cable trenching and drainage systems.								
Impact Management Actions		Implementation			Monitorin				
		Responsible	Method of	Timeframe for	Responsit				
		person	implementation	implementation	person				
-	All excess spoil generated during foundation excavation must be disposed of in an appropriate manner and at a licensed								
	landfill site, if not used for backfilling purposes;								
_	Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for								
	rehabilitation purposes;								
_	Management of equipment for excavation purposes must be undertaken in accordance with Section 5.18: Workshop,								
	equipment maintenance and storage; and								
_	Hazardous substances spills from equipment must be managed in accordance with Section 5.17: Hazardous								
	substances.								

5.27. Installation of foundations, cable trenching and drainage systems

Impact management outcome: No environmental degradation occurs during the installation of foundation, cable trenching and drainage system.									
Impact Management Actions Implementation									
	Responsible	Method of	Timeframe for	Responsible					
	person	implementation	implementation	person					
 Batching of cement to be undertaken in accordance with Section 5.19: Batching plants; and 									
 Residual solid waste must be disposed of in accordance with Section 5.8: Solid waste and hazardous 									
management.									

5.28. Installation of equipment (circuit breakers, current Transformers, Isolators, Insulators, surge arresters, voltage transformers, earth switches)

Impact management outcome: No environmental degradation occurs as a result of installation of equipment.									
Impact Management Actions	Implementation			Monitoring	Monitoring				
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of			
	person	implementation	implementation	person		compliance			
 Management of dust must be conducted in accordance with Section 5. 20: Dust emissions; 									
 Management of equipment used for installation must be conducted in accordance with Section 5.18: Workshop, 									
equipment maintenance and storage;									
 Management hazardous substances and any associated spills must be conducted in accordance with Section 5.17: 									
Hazardous substances; and									
 Residual solid waste must be recycled or disposed of in accordance with Section 5.8: Solid waste and hazardous 									
management.									

5.29. Steelwork Assembly and Erection

Impact management outcome: No environmental degradation occurs as a result of steelwork assembly and erection.									
Impact Management Actions	Implementation Monitoring								
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of			
	person	implementation	implementation	person		compliance			
 During assembly, care must be taken to ensure that no wasted/unused materials are left on site e.g. bolts and nuts 									

g		
ble	Frequency	Evidence of
		oomplianco

•	Frequency	Evidence of
		compliance

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

Impact management outcome: No environmental degradation occurs as a result of steelwork assembly and erection.										
Impact Management Actions	Implementation Monitoring									
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of				
	person	implementation	implementation	person		compliance				
 Emergency repairs due to breakages of equipment must be managed in accordance with Section 5. 18: Workshop, equipment maintenance and storage and Section 5.16: Emergency procedures. 										

5.30. Cabling and Stringing

Impact management outcome: No environmental degradation occurs as a result of stringing.										
Impact Management Ac	ctions	Implementation Moni			Monitoring					
		Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of			
		person	implementation	implementation	person		compliance			
 Residual solid was hazardous Manage Management of economic of economic and the second s	te (off cuts etc.) shall be recycled or disposed of in accordance with Section 5.8: Solid waste and gement; uppment used for installation shall be conducted in accordance with Section 5.18: Workshop , enance and storage;									
 Management haza Hazardous subst 	rdous substances and any associated spills shall be conducted in accordance with Section 5.17 : ances .									

5.31. Testing and Commissioning (all equipment testing, earthing system, system integration)

Impact management outcome: No environmental degradation occurs as a result of Testing and Commissioning.										
Impact Management Actions	Implementation Monitoring									
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of				
	person	implementation	implementation	person		compliance				
- Residual solid waste must be recycled or disposed of in accordance with Section 5.8: Solid waste and hazardous										
management.										

5.32. Socio-economic

Impact management outcome: enhanced socio-economic development.										
Impact Management Actions	Implementation			Monitoring						
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of				
	person	implementation	implementation	person		compliance				
 Develop and implement communication strategies to facilitate public participation; 										
 Develop and implement a collaborative and constructive approach to conflict resolution as part of the external 										
stakeholder engagement process;										
 Sustain continuous communication and liaison with neighboring owners and residents 										
 Create work and training opportunities for local stakeholders; and 										
- Where feasible, no workers, with the exception of security personnel, must be permitted to stay over-night on the site.										
This would reduce the risk to local farmers.										

5.33. Temporary closure of site

Impact management outcome: Minimise the risk of environmental impact during periods of site closure greater than five days.									
Impact Management Actions	Implementation	Implementation Monitoring							
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of			
	person	implementation	implementation	person		compliance			
- Bunds must be emptied (where applicable) and need to be undertaken in accordance with the impact management									
actions included in sections 5.17: Hazardous substances and 5.18: Workshop, equipment maintenance and									
storage;									
 Hazardous storage areas must be well ventilated; 									
 Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service; 									
 Emergency and contact details displayed must be displayed; 									
 Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and 									
emergency personnel;									
 Night hazards such as reflectors, lighting, traffic signage etc. must have been checked; 									
 Fire hazards identified and the local authority must have been notified of any potential threats e.g. large brush 									
stockpiles, fuels etc.;									
 Structures vulnerable to high winds must be secured; 									
 Wind and dust mitigation must be implemented; 									
 Cement and materials stores must have been secured; 									
 Toilets must have been emptied and secured; 									

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

Impact management outcome: Minimise the risk of environmental impact during periods of site closure greater than five days.								
Impact Management Actions	Implementation			Monitoring				
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of		
	person	implementation	implementation	person		compliance		
 Refuse bins must have been emptied and secured; 								
 Drip trays must have been emptied and secured. 								

5.34. Dismantling of old equipment

Impact management outcome: Impact to the environment to be minimised during the dismantling, storage and disposal of old equipment commissioning.								
Impact Management Actions		Implementation			Monitoring			
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of		
	person	implementation	implementation	person		compliance		
 All old equipment removed during the project must be stored in such a way as to prevent pollution of the environment; 								
 Oil containing equipment must be stored to prevent leaking or be stored on drip trays; 								
 All scrap steel must be stacked neatly and any disused and broken insulators must be stored in containers; 								
 Once material has been scrapped and the contract has been placed for removal, the disposal Contractor must ensure 								
that any equipment containing pollution causing substances is dismantled and transported in such a way as to prevent								
spillage and pollution of the environment;								
 The Contractor must also be equipped to contain and clean up any pollution causing spills; and 								
 Disposal of unusable material must be at a licensed waste disposal site. 								

5.35. Landscaping and rehabilitation

Impact management outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.								
Impact Management Actions		Implementation			Monitoring			
		Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of	
		person	implementation	implementation	person		compliance	
-	All areas disturbed by construction activities must be subject to landscaping and rehabilitation; All spoil and waste must							
	be disposed of to a registered waste site;							
-	All slopes must be assessed for contouring, and to contour only when the need is identified in accordance with the							
	Conservation of Agricultural Resources Act, No 43 of 1983							
-	All slopes must be assessed for terracing, and to terrace only when the need is identified in accordance with the							
	Conservation of Agricultural Resources Act, No 43 of 1983;							
-	Berms that have been created must have a slope of 1:4 and be replanted with indigenous species and grasses that							
	approximates the original condition;							
-	Where new access roads have crossed cultivated farmlands, that lands must be rehabilitated by ripping which must be							
	agreed to by the holder of the EA and the landowners;							
-	Rehabilitation of access roads outside of farmland;							
-	Indigenous species must be used for with species and/grasses to where it compliments or approximates the original							
	condition;							
-	Stockpiled topsoil must be used for rehabilitation (refer to Section 5.24: Stockpiling and stockpiled areas);							
-	Stockpiled topsoil must be evenly spread so as to facilitate seeding and minimise loss of soil due to erosion;							
-	Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed;							
-	Subsoil must be ripped before topsoil is placed;							
-	The rehabilitation must be timed so that rehabilitation can take place at the optimal time for vegetation establishment;							
-	Where impacted through construction related activity, all sloped areas must be stabilised to ensure proper rehabilitation							
	is effected and erosion is controlled;							
-	Sloped areas stabilised using design structures or vegetation as specified in the design to prevent erosion of							
	embankments. The contract design specifications must be adhered to and implemented strictly;							
-	Spoil can be used for backfilling or landscaping as long as it is covered by a minimum of 150 mm of topsoil.							
-	Where required, re-vegetation including hydro-seeding can be enhanced using a vegetation seed mixture as described							
	below. A mixture of seed can be used provided the mixture is carefully selected to ensure the following:							
a) Annual and perennial plants are chosen;								
b) P	ioneer species are included;							
c) Species chosen must be indigenous to the area with the seeds used coming from the area;								
d) R	oot systems must have a binding effect on the soil;							
e) T	ne final product must not cause an ecological imbalance in the area							

6. ACCESS TO THE GENERIC EMPr

Once completed and signed, to allow the public access to the generic EMPr, the holder of the EA must make the EMPr available to the public in accordance with the requirements of Regulation 26(h) of the EIA Regulations.

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

APPENDIX E: SENSITIVITY MAP FOR THE STUDY AREA



Potentially sensitive features (BESS only)

Coordinate system: GCS WGS 1984 Data: Kudu PV specialist assessments Thematic: CSIR Basemap: Earthstar Geographics Date: 11/05/2023 ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

APPENDIX F: LAYOUT MAP



Data: Kudu PV specialist studies Thematic: CSIR Date: 5/26/2023

ENVIRONMENTAL IMPACT ASSESSMENT REPORT: Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

APPENDIX G: COMBINED LAYOUT AND SENSITIVITY MAP



Data: Kudu PV specialist studies . Thematic: CSIR Date: 5/26/2023