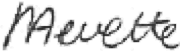




LESAKA 1 SOLAR ENERGY FACILITY (PTY) LTD
Proposed Development of the Lesaka 1
Solar Energy Facility (SEF) and
Associated Infrastructure near
Loeriesfontein in the Northern Cape
Province

Draft Environmental Management
Programme

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LESAKA 1 SOLAR ENERGY FACILITY

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

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LESAKA 1 SOLAR ENERGY FACILITY (PTY) LTD

LESAKA 1 SOLAR ENERGY FACILITY

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

1. INTRODUCTION

Lesaka 1 Solar Energy Facility (Pty) Ltd is proposing to construct the Lesaka 1 Solar Energy Facility (SEF) and associated infrastructure approximately 35 km north of Loeriesfontein in the Hantam Local Municipality and the Namakwa District Municipality, in the Northern Cape Province (**Figure 1**) (DFFE **Reference Number: 14/12/16/3/3/2/2327**). The overall objective of the proposed development is to supply suitable private off-taker initiatives (direct supply or wheeling agreements, as applicable), or be bid into the government coordinated Renewable Independent Power Producer Programme (REIPPP) or similar procurement program under the Integrated Resource Plan (IRP). The proposed development will have a maximum total export capacity of up to 240 megawatt (MW).

SiVEST Environmental Division has subsequently been appointed as the independent Environmental Assessment Practitioner (EAP) to undertake the required Draft Environmental Management Programme (EMPr) (in line with the National Environmental Management Act, 1998 (Act 107 of 1998)) for the proposed construction of the Lesaka 1 SEF and associated infrastructure.

This EMPr provides a set of guidelines for the environmental management of all works executed by the Developer, Engineer, Contractor and Sub-contractor/s to have a minimum impact on the environment in accordance with all relevant legislation, policies and standards. In this context, it should be viewed as a dynamic or “living” document which may require updating or revision during the life-cycle of the development to address new circumstances as the need arises. It is essentially, a written plan of how the environment is to be managed in practical and achievable terms. The EMPr shall be deemed to have contractual standing on the Developer and Contractors onsite.

The effectiveness of the EMPr is limited by the level of adherence to the conditions set forth in this report by the Developer and the Contractor and Sub-contractors. It is further assumed that compliance with the EMPr will be monitored and audited on a regular basis as set out in the EMPr and contractual clauses.

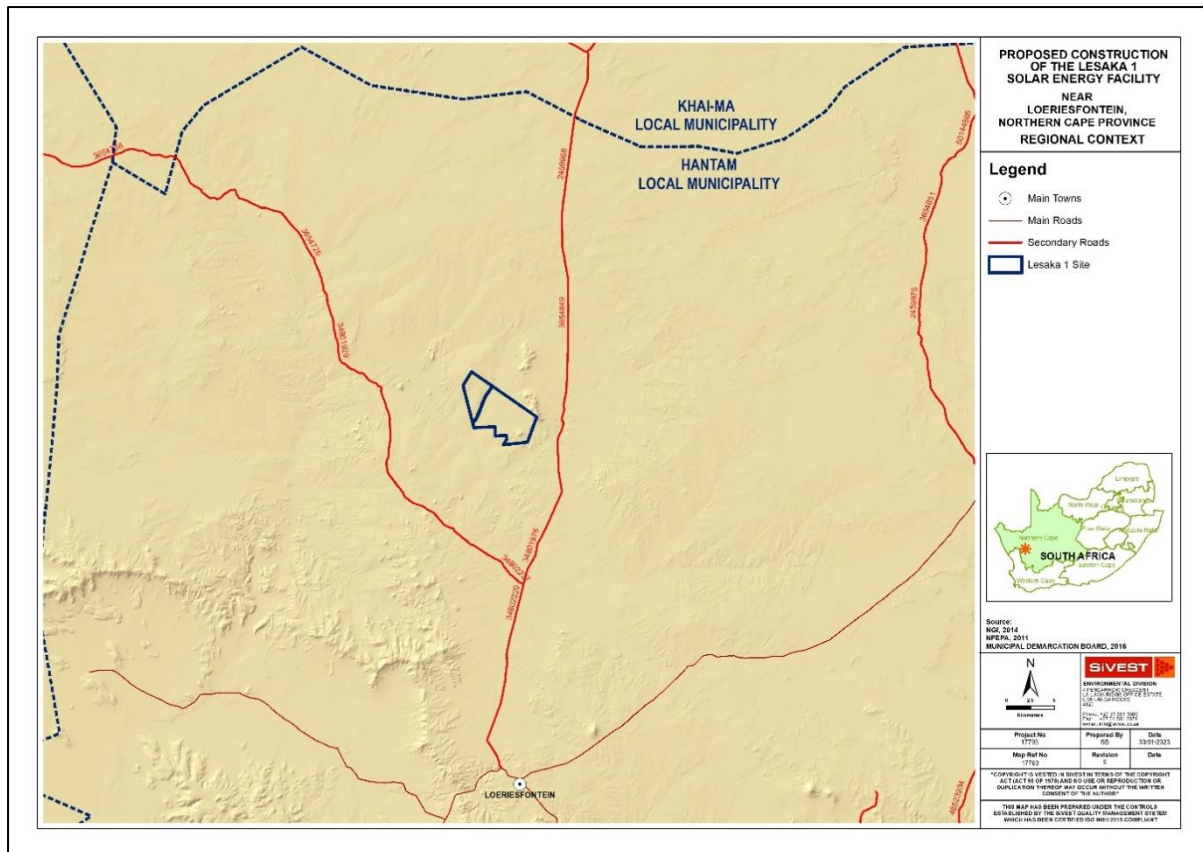


Figure 1: Lesaka 1 SEF Regional Context

1.1 Content Requirements for an Environmental Management Programme

The content requirements for an EMPr (as provided in Appendix 4 of the EIA Regulations 2014, as amended), as well as details of which section of the report fulfils these requirements, are shown in **Table 1** below.

Table 1: Content requirements for a EMPr

2014 EIA Regulations, as amended.	Requirements for an EMPr	Location in this EMPr
Appendix 4, Section 1. (1)	An EMPr must comply with section 24N of the Act and include -	Refer to relevant reference sections below:
Appendix 4, Section 1 (a)	Details of –	-
	(i) The EAP who prepared the EMPr; and	Section 3.1 Section 3.2
	(ii) The expertise of that EAP to prepare an EMPr, including a curriculum vitae.	Section 3.2
Appendix 1, Section 3 (b)	a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 4.1
Appendix 4, Section 1 (c)	a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the	Figure 1 and Figure 4

2014 EIA Regulations, as amended.	Requirements for an EMPr	Location in this EMPr
	environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	
Appendix 4, Section 1 (d)	a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including— (i) planning and design; (ii) pre-construction activities; (iii) construction activities; (iv) rehabilitation of the environment after construction and where applicable post closure; and (v) where relevant, operation activities;	Section 9
Appendix 4, Section 3 (f)	a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to — (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) comply with any prescribed environmental management standards or practices; (iii) comply with any applicable provisions of the Act regarding closure, where applicable; and (iv) comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable;	Section 9
Appendix 4, Section 3 (g)	the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 9
Appendix 4, Section 3 (h)	the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 9
Appendix 4, Section 3 (i)	an indication of the persons who will be responsible for the implementation of the impact management actions;	Section 8 Section 9
Appendix 4, Section 3 (j)	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 9
Appendix 4, Section 3 (k)	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 9
Appendix 4, Section 3 (l)	a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Section 9
Appendix 4, Section 3 (m)	an environmental awareness plan describing the manner in which— (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 11
Appendix 4, Section 3 (n)	any specific information that may be required by the competent authority.	Section 7.3 Section 10
Appendix 4 Section 2	Where a government notice gazetted by the Minister provides for a generic EMPr, such generic EMPr as indicated in such notice will apply.	Generic EMPr has been compiled and included.

2. DETAILS OF APPLICANT

2.1 Name and contact details of the Applicant

Name and contact details of Applicant:

Table 2: Name and contact details of the applicant

Business Name of Applicant	Lesaka 1 Solar Energy Facility (Pty) Ltd
Physical Address	Suite 104, Albion Springs 183 Main Road Rondebosch Cape Town
Postal Address	Suite 104, Albion Springs 183 Main Road Rondebosch Cape Town
Postal Code	7700
Telephone	+27 (0) 21 207 2181
Email	Mercia.Grimbeek@enertrag.com Michael.Barnes@enertrag.com

3. DETAILS AND EXPERTISE OF THE EAP

3.1 Name and contact details of the Environmental Assessment Practitioner (EAP)

The table below provides the name and contact details of the Lead EAP for the project:

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

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

3.2 Names and expertise of the EAPs

The table below provides the names of the people who prepared this report and their expertise:

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

Name of representative of the EAP	Educational Qualifications	Professional Affiliations	Experience (years)
Michelle Nevette (<i>Cert.Sci.Nat.</i>)	MEnvMgt. (Environmental Management)	SACNASP Registration No. 120356 EAPASA Registration No. 2019/1560 IAIAsa	21
Michelle Guy (<i>Pr.Sci.Nat.</i>)	MSc Environmental Science	SACNASP Registration No. 126338 EAPASA Registration No. 2019/868	10

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Name of representative of the EAP	Educational Qualifications	Professional Affiliations	Experience (years)
		IAIAsa	
Prisantha Govender (Reg. EAP)	BSc Honours Environmental Management	EAPASA Registration No. 2020/2590 IAIAsa	4.5

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

3.3 Names and expertise of the specialists

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

Table 5: Names of specialists involved in the project

Company	Name of representative of the specialist	Specialist	Educational Qualifications	Experience (years)
SRK Consulting	Kelly Armstrong	Visual Impact Assessment	BSocSc (Hons)	4
	Chris Dalgliesh		BBusSci (Hons) M Phil (Env) EAPASA	35
CTS Heritage	Jenna Lavin	Heritage Impact Assessment	MSc. Archaeology (UCT), CPD in Conservation of the Built Environment (UCT)	12
	Elize Butler	Palaeontology Impact Assessment	MSc Zoology	28
Johann Lanz Consulting	Johann Lanz	Agriculture and Soils Impact Assessment (desktop)	M.Sc. (Environmental Geochemistry)	24
Tony Barbour	Tony Barbour	Socio-economic Impact Assessment (desktop)	BSc (Geology and Economics) Rhodes (1984); B Economics (Honours) Rhodes (1985); MSc (Environmental Science), University of Cape Town (1992)	28
Enviro Insight	Corné Niemandt	Terrestrial Biodiversity Assessment	MSc Plant Science Pr. Sci. Nat.	8
Enviro Insight	Sam Laurence	Avifaunal Impact Assessment	BSc, BSC Hons, M.Sc. candidate.	15

Company	Name of representative of the specialist	Specialist	Educational Qualifications	Experience (years)
			Pr. Sci. Nat. Zoological Science	
FEN Consulting	Cole Grainger	Surface Water Impact Assessment	MSc Conservation Ecology Cand.Sci.Nat	6
	Stephen van Staden		MSc Environmental Management Pr. Sci. Nat	20
GaGE Consulting (Pty) Ltd	Duan Swart	Desktop Geotechnical Impact Assessment	MSc Engineering Geology Pr.Sci.Nat 137543	4
SiVEST SA	Ntuthuko Hlanguza	Transportation Study	Pr. Eng	7
iSHEcon	Debra Mitchell	Quantitative Risk Assessment	MSc (Chem Eng) and Pr.Eng	25
Highlands Hydrology	Luke Wiles	Hydrological Impact Assessment	MSc Hydrology Pr.Sci.Nat 400123/10	16

4. ACTIVITY INFORMATION

4.1 Project Description

The application site being assessed (which incorporates the farm portions / properties) is approximately 4 894.93 hectares (ha) in extent.

In summary, the proposed Lesaka 1 SEF development will include the following components:

- Buildable area of PV approximately 591 ha.
- Export capacity of up to 240MW.
- Solar Module Technology – Monocrystalline or Polycrystalline cell type (Monofacial and/or Bifacial Photovoltaic (PV) Modules) with fixed, single or dual axis tracking mounting structures.
- Low and medium voltage cabling will link the PV facility to the facility substation / grid connection infrastructure. These cables will be either overhead or laid underground wherever technically feasible (up to 33kV).
- Access road/s to the site and internal roads between project components of up to 5m and 6m, this can increase to 8m on bends. The roads to be placed with a corridor of up to 20m width to accommodate cable trenches, stormwater channels (as required), and turning circle/bypass areas of up to 20m in some sections. Existing roads will be upgraded wherever needed, and new roads will be constructed where necessary.
- Operation and maintenance (O&M) building to be located near the IPP substation and/or BESS (including septic/conservancy tanks with portable toilets). Typical areas include: Operations building (20m x 10m = 200m²), Workshop (15m x 10m = 150m²), and Stores (5m x 10m = 150m²).
- Construction camp laydown area approximately 0.5 ha in size.
- Temporary laydown/staging area during construction phase approximately 2.2 ha in size.

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The solar panels and all other project infrastructure have been placed strategically within the development area based on environmental constraints and sensitivity findings.

A summary of the project technical details is provided in **Table 6** below.

Table 6: Technical Detail Summary

Component	Description / Dimensions
Location of site (centre point)	30°36'49.45"S 19°28'14.63"E
Application site area	4 894.93 ha (overall farm area)
PV development area	Approximately 591 ha
SG codes	C0150000000026400000
Export capacity	Up to 240 MW
Proposed technology	Solar Module Technology – Monocrystalline or Polycrystalline cell type. Monofacial and/or Bifacial Photovoltaic (PV) Modules. Mounting System Technology – Single-axis tracking, Dual-axis tracking, or Fixed axis tracking. Overhead or underground LV and MV cabling. Centralised inverter stations or string inverters. Power Transformers.
Max panel height from the ground	5 m
Substation area	6.5 ha
Battery Energy Storage Area (BESS)	The associated BESS storage capacity will be up to 120MW / 480MWh with up to four hours of storage. It is proposed that Lithium Battery Technologies, such as Lithium Iron Phosphate, Lithium Nickel Manganese Cobalt oxides or Vanadium Redox flow technologies will be considered as the preferred battery technology however the specific technology will only be determined following Engineering, Procurement, and Construction (EPC) procurement. The main components of the BESS include the batteries, power conversion system, and transformer which will all be stored in various rows of containers. The approximate footprint for the BESS is 4 ha.
Capacity of on-site and collector substation	33/132kV
O&M building area	Located near the onsite IPP SS and/or BESS. Septic/Conservancy tanks with portable toilets Typical areas include: - Operations building – 20m x 10m = 200m ² - Workshop – 15m x 10m = 150m ² - Stores – 5m x 10m = 150m ²
Construction Camp Laydown area	Typical area 100m x 50m = 5 000m ² (0.5 ha)
Temporary laydown or staging area	Typical area 220m x 100m = 22 000m ² (2.2 ha)

Component	Description / Dimensions
Internal roads	Access road/s to the site and internal roads between project components of up to 5m and 6m, this can increase to 8m on bends. The roads to be placed with a corridor of up to 20m width to accommodate cable trenches, stormwater channels (as required), and turning circle/bypass areas of up to 20m in some sections. Existing roads will be upgraded wherever needed, and new roads will be constructed where necessary.
Site Access	Access to the development area can be obtained via the AP2972, which is approximately 7 km east of the proposed development area.
Proximity to grid connection	On site via a Loop-In-Loop-Out connection to the existing 400kV line.
Associated Infrastructure	<ul style="list-style-type: none"> - Fencing and lighting (fences will run adjacent to the solar buildable areas and outside all no-go areas). - Lightning Protection System (LPS). - Telecommunication infrastructure. - Batching plant (if required). - Security infrastructure. - Access and internal roads. - Stormwater infrastructure (as needed). - Water pipelines (as needed).

4.2 NEMA Listed Activities

The amended EIA Regulations promulgated under Section 24(5) of the National Environmental Management Act, Act 107 of 1998 and published in Government Notice No. R. 326 list activities which may not commence without environmental authorization from the Competent Authority. The proposed activity is identified in terms of Government Notice No. R. 327, 325 and 324 for activities which must follow a full Environmental Impact Assessment Process. The project will trigger the following listed activities:

Table 7: Listed activities in terms of NEMA: EIA Regulations 2014 (as amended in 2017), applicable to the proposed project

Activity No(s):	Relevant activities as set out in Listing Notices 1, 2 and 3 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
Relevant Basic Assessment Activities as set out in Listing Notice 1		
11 (i)	GN R. 327 (as amended) Item 11: The development of facilities or infrastructure for the transmission and distribution of electricity— (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.	New on-site substations/collector switching stations will be constructed as part of the proposed development. The proposed substation / collector switching stations will be located outside urban areas and will have capacities of 33/132kV respectively. The substations will be connected via underground/overhead powerlines.
12 (ii) (a) (c)	GN R. 327 (as amended) Item 12: The development of:	Drainage lines and watercourses are located across the proposed site.

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Activity No(s):	Relevant activities as set out in Listing Notices 1, 2 and 3 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
	<p>ii) infrastructure or structures with a physical footprint of 100 square metres or more;</p> <p>where such development occurs-</p> <p>(a) within a watercourse;</p> <p>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.</p>	<p>One or more roads and/or powerlines and/or services will cross these watercourses or drainage lines or be within 32m thereof.</p> <p>The proposed developments will therefore entail the construction of infrastructure with physical footprints of approximately 100m² or more within a surface water feature / watercourse or within 32m of a surface water feature / watercourse.</p>
14	<p>GN R. 327 (as amended) Item 14: The development of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.</p>	<p>“Dangerous goods” that are likely to be associated with the project include fuel stored during the construction phase and/or hazardous chemical substances at the substation during the operational phase. Threshold of 80 m³ expected to be exceeded.</p> <p>The Facility will require storage and handling of dangerous goods, including fuel, cement and chemical storage onsite, that will be greater than 80m³ but not exceeding 500m³. The following estimated maximum capacities of dangerous good will be stored on site:</p> <ul style="list-style-type: none"> • Concrete Batching: ~125 m³ • Fuel stores (Petrol and/or Diesel): ~250m³ • Paint, grease, transformer oils, construction chemicals, lubricants: ~100m³
19	<p>GN R. 327 (as amended) Item 19: The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;</p>	<p>The proposed development will involve the excavation, removal, infilling or depositing of any material of more than 10m³ into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10m³ from some of the identified surface water features / watercourses.</p> <p>Although the layout of the proposed developments will be designed to avoid the identified surface water features / watercourses as far as possible, some of the internal and/or access roads/project related infrastructure may need to traverse the identified surface water features / watercourses. In addition, during</p>

Activity No(s):	Relevant activities as set out in Listing Notices 1, 2 and 3 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
		construction , soil will need to be removed from some of the identified surface water features / watercourses.
24 (ii)	<p>GN R. 327 (as amended) Item 24: The development of a road -</p> <p>ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres.</p>	Internal access roads will be required to access the PV panels and substations. The roads to be placed within a corridor of up to 20m width to accommodate cable tranches, stormwater channels (as required), and turning circle/bypass areas of up to 20m in some sections. Existing roads will be used wherever possible, although new roads will be constructed where necessary.
28 (ii)	<p>GN R. 327 (as amended) Item 28: Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:</p> <p>(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;</p>	The total area to be developed for the proposed renewable energy facilities is greater than 1ha and occurs outside an urban area in an area currently zoned as agricultural land.
48 (i) (a) (c)	<p>GN R. 327 (as amended) Item 48: The expansion of-</p> <p>(i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more;</p> <p>where such expansion occurs—</p> <p>(a) within a watercourse; or</p> <p>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;</p>	<p>The proposed development will entail the expansion (upgrading) of roads and other infrastructure by 100m² or more within a surface water feature / watercourse or within 32m from the edge of a surface water feature / watercourse.</p> <p>Although the layouts of the proposed developments will be designed to avoid the identified surface water features / watercourses as far as possible, some of the internal and access roads and project related infrastructure to be upgraded will need to traverse the identified surface water features / watercourses and construction will occur within some of the surface water features / watercourses and/or be within 32m of some of the surface water features / watercourses.</p>
56 (ii)	<p>GN R. 327 Item 56: The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre -</p>	Internal access roads will be required to access the PV panels and the substation. Existing roads will be used wherever possible, although new roads will be constructed where necessary. The existing access

Activity No(s):	Relevant activities as set out in Listing Notices 1, 2 and 3 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
	(i) where the existing reserve is wider than 13,5 metres; or (ii) where no reserve exists, where the existing road is wider than 8 metres –	roads will need to be upgraded by widening them more than 6m, or by lengthening them by more than 1km.
Relevant Scoping and EIA Activities as set out in Listing Notice 2 of the EIA Regulations, 2014 as amended		
1	GN R. 325 (as amended) Item 1: The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more.	The proposed development will entail the construction of a SEF where the respective electricity output will be up to 240 MW. In addition, the proposed SEF development will be located outside urban areas.
15	GN R. 325 (as amended) Item 15: The clearance of an area of 20 hectares or more of indigenous vegetation.	The proposed SEF development will involve the clearance of more than 20 ha of indigenous vegetation. Clearance will also be required for the proposed substations, internal access roads and other associated infrastructure.
Relevant Basic Assessment Activities as set out in Listing Notice 3 of the EIA Regulations, 2014 as amended		
4 (g)(ii)(ee)	GN R. 324 (as amended) Item 4: The development of a road wider than 4m with a reserve less than 13.5 metres. g. Northern Cape ii. Outside Urban Areas: (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.	The development of the SEF facility and associated infrastructure will require the development of roads wider than 4 m with a reserve of less than 13.5 m within a CBA 1 and CBA 2 area. These roads will occur within the Northern Cape Province, outside urban areas.
12 (g)(ii)	GN R. 324 (as amended) Item 12: The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. g. Northern Cape (ii) Within critical biodiversity areas identified in bioregional plans.	The proposed development will entail the construction of infrastructure with physical footprints of approximately 300 m ² or more within areas identified as CBA 1 and CBA 2 area. As such, approximately 300 m ² or more of indigenous vegetation will likely be cleared as part of the respective proposed developments.
14 (ii)(a)(c)(g)(ii)(ff)	GN R. 324 (as amended) Item 14: The development of— (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs— (a) within a watercourse; or (c) if no development setback has been adopted, within 32 metres of a	The proposed development will entail the development of infrastructure with physical footprints of 10m ² or more within a watercourse / surface water feature or within 32 m from the edge of a watercourse / surface water feature. The construction of the infrastructure for the development will occur within CBA Areas 1 and 2 and Ecosystem Support Areas.

Activity No(s):	Relevant activities as set out in Listing Notices 1, 2 and 3 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
	<p>watercourse, measured from the edge of a watercourse;</p> <p>excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</p> <p>g. Northern Cape ii. Outside urban areas: (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p>	
18 (g)(ii)(ee)(ii)	<p>GN R. 324 (as amended) Item 18: The widening of a road by more than 4 meters, or the lengthening of a road by more than 1 kilometer-</p> <p>g. Northern Cape ii. Outside urban areas: (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ii) Areas within a watercourse or wetland; or within 100m from the edge of a watercourse or wetland.</p>	<p>Internal access roads will be required to access the solar panels as well as the substation. Existing roads will be used wherever possible. Internal access roads will thus be widened by more than 4 m or lengthened by more than 1 km. These roads will occur within the Northern Cape Province, outside urban areas. The widening of the roads will occur within a CBA 1 and 2 area as well as a watercourse or wetland or within 100 m from the edge of a watercourse or wetland.</p>
23 (ii)(a)(c) (g)(ii)(ee)	<p>GN R. 3245 (as amended) Item 23: The expansion of—</p> <p>(ii) infrastructure or structures where the physical footprint is expanded by 10 square metres or more;</p> <p>where such expansion occurs—</p> <p>(a) within a watercourse; (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;</p> <p>excluding the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</p> <p>g. Northern Cape ii. Outside urban areas:</p>	<p>The proposed development will entail the development and expansion of roads and other infrastructure by 10m² or more within a watercourse or within 32m from the edge of a watercourse.</p> <p>The expansion of the infrastructure will occur within the Northern Cape Province, outside urban areas, within a CBA 1 and 2 area.</p> <p>Although the layout of the proposed development will be designed to avoid the identified surface water features as far as possible, some of the existing internal and access roads will need to traverse some of the identified surface water features.</p>

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

5. LOCATION OF THE ACTIVITY

5.1 Regional Locality

The proposed development is located approximately 35 km north of Loeriesfontein in the Hantam Local Municipality and the Namakwa District Municipality in the Northern Cape Province (**Figure 3**).

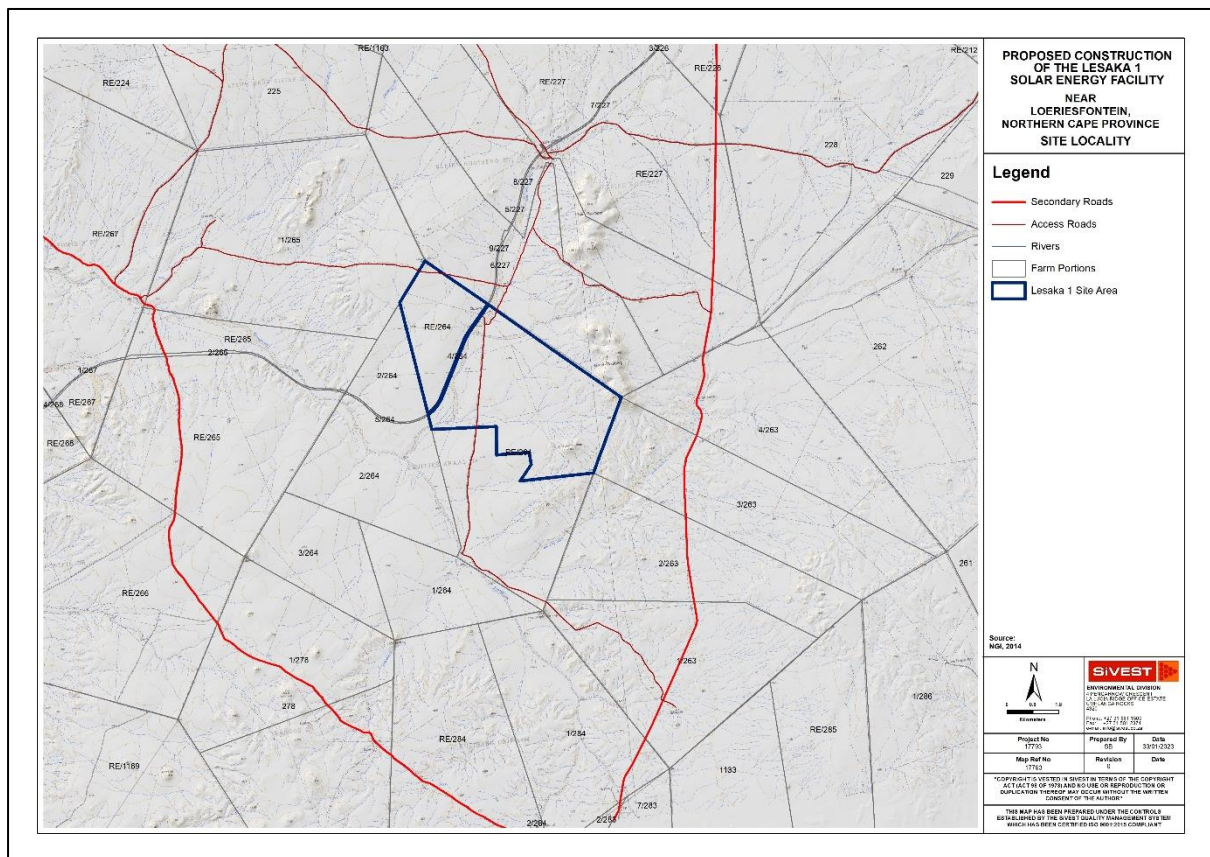


Figure 3: Site Locality

5.2 Summary of affected properties

Table 8: Summary of affected properties (including SG Codes and Farm Names)

SG CODE	DESCRIPTION
C01500000000026400000	PORTION 0 OF THE FARM KLUITJES KRAAL NO. 264

LESAKA 1 SOLAR ENERGY FACILITY (PTY) LTD

Prepared by:



Project No. 17793
Description Lesaka 1 SEF EMPr
Revision No. 1.0

Date: July 2023

5.3 Coordinates of the site

The centre point coordinates for the sites are as follows:

- Latitude: 30° 36' 49.45" S
- Longitude: 19° 28' 14.63" E

The bend point coordinates of the site have been included below:

Table 9: Bend point coordinates for the Lesaka 1 SEF site boundary

LESAKA 1 SEF: APPLICATION SITE		
COORDINATES AT CORNER POINTS (DD MM SS.sss)		
POINT	SOUTH	EAST
1	30°34'18.06"S	19°26'38.26"E
2	30°37'12.02"S	19°30'31.88"E
3	30°38'32.50"S	19°29'46.16"E
4	30°38'32.97"S	19°28'11.14"E
5	30°38'15.94"S	19°28'27.34"E
6	30°38'2.07"S	19°28'26.28"E
7	30°38'1.32"S	19°27'44.13"E
8	30°37'29.89"S	19°27'47.76"E
9	30°37'25.49"S	19°26'24.34"E
10	30°35'1.18"S	19°26'0.30"E
COORDINATES AT CENTRE POINT (DD MM SS.sss)		
POINT	SOUTH	EAST
11	30°36'51.54"S	19°28'7.65"E

Table 10: Corner point coordinates for Onsite Substation, O&M Building and BESS

LESAKA 1 SEF: ONSITE SUBSTATION, O&M BUILDING AND BESS (6.5ha)		
COORDINATES AT CORNER POINTS (DD MM SS.sss)		
POINT	SOUTH	EAST
1	30°37'32.23"S	19°27'47.65"E
2	30°37'32.90"S	19°27'55.68"E
3	30°37'42.60"S	19°27'54.57"E
4	30°37'41.91"S	19°27'46.54"E
COORDINATES AT CENTRE POINT (DD MM SS.sss)		
POINT	SOUTH	EAST
5	30°37'37.44"S	19°27'51.00"E

Table 11: Corner point coordinates for Temporary Laydown Area

LESAKA 1 SEF: TEMPORARY LAYDOWN AREA (6.5ha)		
COORDINATES AT CORNER POINTS (DD MM SS.sss)		
POINT	SOUTH	EAST
1	30°36'10.57"S	19°27'35.24"E

LESAKA 1 SEF: TEMPORARY LAYDOWN AREA (6.5ha)		
2	30°36'12.08"S	19°27'43.12"E
3	30°36'21.58"S	19°27'40.70"E
4	30°36'20.08"S	19°27'32.81"E
COORDINATES AT CENTRE POINT (DD MM SS.sss)		
POINT	SOUTH	EAST
5	30°36'15.96"S	19°27'38.16"E

Table 12: Coordinates for Solar Field Buildable Area Prospect 1

LESAKA 1 SEF: SOLAR FIELD BUILDABLE AREA PROSPECT 1 (235 ha)		
COORDINATES AT CORNER POINTS (DD MM SS.sss)		
POINT	SOUTH	EAST
1	30°35'51.64"S	19°27'44.09"E
2	30°35'54.82"S	19°27'53.88"E
3	30°35'58.04"S	19°28'10.12"E
4	30°35'57.65"S	19°28'30.55"E
5	30°35'52.34"S	19°28'44.37"E
6	30°36'3.57"S	19°28'58.99"E
7	30°37'0.32"S	19°27'18.35"E
8	30°36'50.40"S	19°27'19.46"E
9	30°36'48.21"S	19°27'19.52"E
10	30°36'42.51"S	19°27'17.53"E
11	30°36'40.70"S	19°27'20.40"E
12	30°36'37.46"S	19°27'21.45"E
13	30°36'20.09"S	19°27'32.55"E
14	30°36'21.67"S	19°27'40.78"E
15	30°36'12.07"S	19°27'43.21"E
16	30°36'10.53"S	19°27'35.19"E
17	30°36'8.91"S	19°27'35.60"E
18	30°36'7.46"S	19°27'46.65"E
19	30°36'5.16"S	19°27'47.19"E
20	30°36'3.22"S	19°27'51.64"E
21	30°36'0.46"S	19°27'52.53"E
22	30°35'58.72"S	19°27'47.05"E
23	30°35'59.30"S	19°27'41.83"E
COORDINATES AT CENTRE POINT (DD MM SS.sss)		
POINT	SOUTH	EAST
24	30°36'17.02"S	19°28'2.32"E

Table 13: Coordinates for Solar Field Buildable Area Prospect 2

LESAKA 1 SEF: SOLAR FIELD BUILDABLE AREA PROSPECT 2 (135 ha)		
COORDINATES AT CORNER POINTS (DD MM SS.sss)		
POINT	SOUTH	EAST
1	30°36'53.88"S	19°28'10.79"E

LESAKA 1 SEF: SOLAR FIELD BUILDABLE AREA PROSPECT 2 (135 ha)		
2	30°36'42.97"S	19°28'22.96"E
3	30°36'42.39"S	19°28'30.16"E
4	30°36'43.67"S	19°28'43.37"E
5	30°36'42.85"S	19°28'49.10"E
6	30°36'44.84"S	19°28'58.85"E
7	30°36'49.50"S	19°29'2.30"E
8	30°36'53.27"S	19°28'57.25"E
9	30°36'58.12"S	19°28'55.64"E
10	30°37'11.33"S	19°28'42.44"E
11	30°37'10.95"S	19°28'38.92"E
12	30°37'15.09"S	19°28'37.00"E
13	30°37'18.73"S	19°28'36.70"E
14	30°37'24.31"S	19°28'27.06"E
15	30°37'25.20"S	19°28'22.47"E
16	30°37'22.97"S	19°28'1.12"E
17	30°37'14.99"S	19°27'49.40"E
18	30°37'12.78"S	19°27'46.61"E
19	30°37'10.28"S	19°27'46.71"E
20	30°37'5.76"S	19°28'8.97"E
21	30°37'2.57"S	19°28'18.87"E
22	30°36'56.42"S	19°28'17.14"E
23	30°36'55.84"S	19°28'19.20"E
24	30°36'52.60"S	19°28'19.36"E
COORDINATES AT CENTRE POINT (DD MM SS.sss)		
POINT	SOUTH	EAST
25	30°37'3.23"S	19°28'31.88"E

Table 14: Coordinates for Solar Field Buildable Area Prospect 3

LESAKA 1 SEF: SOLAR FIELD BUILDABLE AREA PROSPECT 3 (185 ha)		
COORDINATES AT CORNER POINTS (DD MM SS.sss)		
POINT	SOUTH	EAST
1	30°37'31.58"S	19°27'55.85"E
2	30°37'33.80"S	19°28'5.13"E
3	30°37'32.41"S	19°28'41.15"E
4	30°37'36.23"S	19°28'41.42"E
5	30°37'36.23"S	19°28'46.97"E
6	30°37'40.18"S	19°28'48.57"E
7	30°37'40.37"S	19°28'52.37"E
8	30°37'45.70"S	19°28'53.70"E
9	30°37'50.93"S	19°28'54.56"E
10	30°37'52.89"S	19°28'51.11"E
11	30°38'8.42"S	19°28'43.59"E
12	30°38'18.31"S	19°28'40.31"E

LESAKA 1 SEF: SOLAR FIELD BUILDABLE AREA PROSPECT 3 (185 ha)		
13	30°38'19.38"S	19°28'36.54"E
14	30°38'31.79"S	19°28'25.83"E
15	30°38'31.68"S	19°28'14.84"E
16	30°38'18.58"S	19°28'27.67"E
17	30°38'1.98"S	19°28'29.25"E
18	30°38'1.36"S	19°27'44.14"E
19	30°37'41.95"S	19°27'46.43"E
20	30°37'42.61"S	19°27'54.57"E
COORDINATES AT CENTRE POINT (DD MM SS.sss)		
POINT	SOUTH	EAST
21	30°37'53.47"S	19°28'35.13"E

Table 15: Coordinates for Solar Field Buildable Area Prospect 4

LESAKA 1 SEF: SOLAR FIELD BUILDABLE AREA PROSPECT 4 (36 ha)		
COORDINATES AT CORNER POINTS (DD MM SS.sss)		
POINT	SOUTH	EAST
1	30°35'32.70"S	19°28'15.83"E
2	30°35'34.60"S	19°28'18.85"E
3	30°35'34.54"S	19°28'20.11"E
4	30°35'36.08"S	19°28'23.09"E
5	30°35'47.55"S	19°28'38.38"E
6	30°35'50.33"S	19°28'29.10"E
7	30°35'51.47"S	19°28'2.04"E
8	30°35'48.29"S	19°27'52.89"E
9	30°35'38.55"S	19°28'8.37"E
10	30°35'39.68"S	19°28'13.78"E
11	30°35'38.52"S	19°28'15.21"E
12	30°35'36.86"S	19°28'14.89"E
13	30°35'35.99"S	19°28'10.32"E
COORDINATES AT CENTRE POINT (DD MM SS.sss)		
POINT	SOUTH	EAST
14	30°35'44.45"S	19°28'17.93"E

5.4 Study Area Description

The area around the SEF property is predominantly characterised by grazing lands (natural vegetation), with supporting infrastructure (roads, powerlines and a railway line). A road (AP 2972) extends northwards from Loeriesfontein and to the east of the SEF property. The Sishen-Saldanha railway line is routed adjacent to the Klein-Rooiberg River bisecting the northern portion of the SEF property. Existing large-scale powerlines are also present around the SEF property, increasing in concentration nearer the existing Helios MTS. There are approximately 12 renewable energy projects within ~35 km of the SEF property.

The visual character of the project area is provided by the topography, vegetation and land use of the area which is a rural environment characterised by the sparsely vegetated prominences and ridgelines separated by often, wide flat expanses interspersed with farmstead and some infrastructure. The project area can therefore be defined as a natural transition landscape as it is mostly rural with few isolated farmsteads and some powerlines, roads and railway line visible in the landscape.

The entire study area is located in the Hantam Karoo vegetation type (part of the Succulent Karoo Biome). The site is generally flat with slightly undulating ground topography due to the various rills and gullies formed from erosion. The north-eastern portion of the site has flat to convex plateaus and isolated ridge lines. Isolated koppies and higher lying plateaus exist on the site. The study area is underlain by rock units of Ecca Group of Karoo Supergroup and intrusive dolerite.

The area surrounding Loeriesfontein is considered to have a desert climate with little rainfall all year long. The area can be classified as hot desert climate (BWh) according to the Köppen-Geiger climate classification. The average annual rainfall is 224 mm with the average maximum and minimum temperatures of 22.8°C and 9.9°C, respectively.

Refer to **Appendix D** for the summary of the specialist findings and recommendations for the Lesaka 1 SEF.

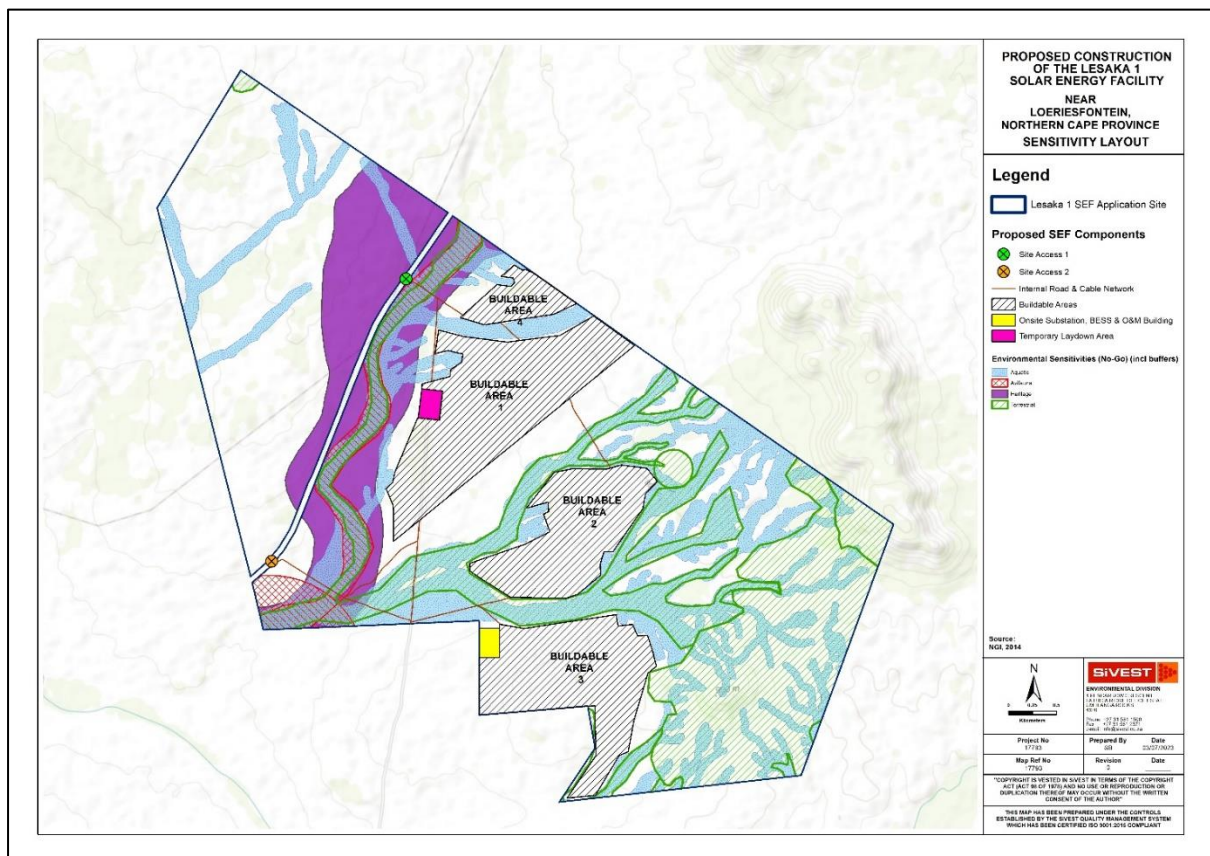


Figure 4: Proposed Layout with Sensitivity Overlay

6. ENVIRONMENTAL MANAGEMENT PROGRAMME

6.1 Introduction

The EMPr has been prepared in order to comply with the requirements as stipulated in the National Environmental Management Act (No. 107 of 1998).

This EMPr includes:

- Details and expertise of the EAP who prepared the EMPr including curriculum vitae;
- Project Description;
- Facility Illustration Plans;
- Mitigation measures as contained in the Impact Assessment Report;
- Recommendations and conclusions emanating from the specialist studies;
- Impact Management Objectives and Actions; and
- A copy of the EA (if granted).

6.2 Aim and Objectives of the EMPr

The aim of the EMPr is to:

- Identify those construction activities identified for the proposed development that may have a negative impact on the environment;
- Outline the mitigation measures that will need to be taken and the steps necessary for their implementation;
- Describe the reporting system to be undertaken during construction.

The objectives of the EMPr are to:

- Identify a range of mitigation measures which could reduce and mitigate the potential adverse impacts to minimal or insignificant levels.
- Provide a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on site.
- Provide management structures that address the comments raised by I&APs pertaining to the development.
- Ensure that the environmental specifications are identified, effective and contractually binding so as to enable compliance on site.

6.3 Layout of the EMPr

The EMPr identifies the four phases of development as:

- Preconstruction Planning Phase Activities (Section 9.1)
- Construction Phase Activities (Section 9.2)
- Operation Phase Activities (Section 9.3)
- Decommissioning Phase Activities (Section 9.4)

The generic and specific provisions are included together under each phase for each environmental consideration. The generic provisions are the general environmental issues, procedures and controls that can be applied to the project and site as a whole. The specific provisions are those environmental issues, procedures and controls that are relevant to a particular section of the site. It should be understood that the EMPr is considered an evolving document and may be amended at any time by the relevant authorities (DFFE, DWS etc.).

7. LEGAL AND OTHER REQUIREMENTS

7.1 Compliance with Applicable Laws

The supreme law of the land is “The Constitution of the Republic of South Africa”, which states: “*Every person shall have the right to an environment which is not detrimental to his or her health or wellbeing*”. Laws applicable to the protection of the environment in terms of Environmental Management (and relating to construction activities) include but are not restricted to:

- Animals Protection Act, Act No. 71 of 1962
- Astronomy Geographic Advantage (Act No. 21 of 2007)
- Civil Aviation Act (Act No.13 of 2009)
- Conservation of Agricultural Resources Act, Act No. 43 of 1983
- Development Facilitation Act No. 67 of 1995
- Environment Conservation Act, Act No. 73 of 1989
- Environmental Planning Act, Act No. 88 of 1967
- Hazardous Substances Act, Act No. 15 of 1973
- Land Survey Act, Act No. 9 of 1921
- Minerals Act, Act No. 50 of 1991
- National Environmental Management: Air Quality Act, Act No. 39 of 2004);
- National Environmental Management: Biodiversity Act, Act No. 10 of 2004, as amended)
- National Environmental Management Act, Act No.107 of 1998
- NEMA EIA Regulations, 2014 (as amended)
- National Environmental Management: Protected Areas Act (NEM: PAA) (Act No. 57 of 2003, as amended)
- National Environmental Management: Waste Act, Act No. 59 of 2008
- National Forests Act (NFA) (Act No. 84 of 1998)
- The National Heritage Resources Act, Act No. 25 of 1999
- National Water Act, Act No. 36 of 1998
- National Dust Control Regulations (GN No. R. 827 of 1 November 2013)
- National Road Traffic (Act No. 93 of 1996, as amended)
- Occupational Health and Safety Act, Act No. 85 of 1993
- Provincial and Local Government Ordinances and Bylaws
- Soil Conservation Act, Act No. 76 of 1969
- Subdivision of Agricultural Land (Act No. 70 of 1970, as amended)
- Water Services Act, Act No. 108 of 1997

Several regulations will be applicable to the construction phase of the project. These guidelines are mentioned in the EMPr tables. The EMPr forms part of the Contract Documentation and is thus a legally binding document.

7.2 Compliance with the Environmental Management Programme

A copy of the EMPr must be kept on site during the construction period at all times. The EMPr will be made binding on all contractors operating on the site and will be included within the Contractual Clauses. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance with the Environmental Authorisation (EA) issued by DFFE.

It should be noted that in terms of Section 28 of the National Environmental Management Act (NEMA) Act No. 107 of 1998, those responsible for Environmental Damage must pay the repair costs both to the environment and human health and the preventative measures to reduce or prevent further pollution and/or environmental damage. (The polluter pays principle).

In terms of the EA, non-compliance of the EA may result in invalidation of the EA, criminal prosecution or other actions provided for in the NEMA (as amended) and associated regulations. Any non-compliance must result in an immediate stop to works being issued. The Contractor and Developer will be held liable for any damage and consequent rehabilitation to environmentally sensitive areas outside the site boundary. In the event of any dispute concerning the significance of a particular impact, the opinion of DFFE in respect of its significance will prevail.

National government, provincial government, local authorities or committees appointed in terms of the conditions of the EA or any other public authority shall not be held responsible for any damages or losses suffered by the authorisation holder or successor in title in any instance where construction or operation subsequent to construction is temporarily or permanently stopped for reasons of non-compliance by the authorisation holder with the conditions of authorisation as set out in this document or any subsequent document emanating from these conditions of authorisation.

7.3 Specific Conditions Pertaining to Authorisations

Should the Department of Forestry, Fisheries and the Environment (DFFE) issue an Environmental Authorisation (EA), this EMPr will be updated to include any additional pre-construction, construction, operation and decommissioning conditions stipulated in the EA not already included below.

A water use licence will be applied for and may become applicable to the proposed project at a later stage.

Specific conditions pertaining to regulatory processes, or Licensee / Holder of the Authorisation requirements, have not been included within the EMPr and will only be included on finalization of the EMPr (pending decision). These conditions are to be undertaken by the Licensee / Holder of the Authorisation prior to the commencement of construction.

8. PROJECT RESPONSIBILITIES

8.1 Responsible Parties and associated roles

As described above, **Table 16** below provides a summary of the responsible parties and the auditing process to be carried out.

Table 16: Responsible Parties and Auditing Process

LESAKA 1 SOLAR ENERGY FACILITY (PTY) LTD

Prepared by:



Project No. 17793
Description Lesaka 1 SEF EMPr
Revision No. 1.0

Date: July 2023

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TITLE	PARTY	ROLE DURING CONSTRUCTION	ROLE DURING OPERATION
Project Developer (Proponent)	Lesaka 1 Solar Energy Facility (Pty) Ltd	Assume ultimate responsibility	Assume ultimate responsibility
Project Manager	To be appointed by proponent	Project management	N/A
Contractor's Project Manager	Balance of Plant Contractor	Construction management	N/A
Main Contractor/s	There will be multiple contracts placed for the construction phase. These will cover civil earthworks and concrete, structural mechanical and electrical / instrumentation. There could also be the construction camp management contract. These may be managed by the Contractor's Project Manager (or other).	Main Contractor will undertake day to day construction activities covering aspects such as civil earthworks and concrete, structural mechanical and electrical / instrumentation.	N/A
Environmental Officer	To be appointed by Main Contractors	Day to day environmental responsibility, point of contact for Environmental Control Officer (ECO)	N/A
Environmental Control Officer	To be appointed by Project Developer	Monthly audits Monthly report submission to competent authority	Annual audits Annual report submission to competent authority
Competent Authority	National Department of Forestry, Fisheries and the Environment (DFFE)	Conduct site visits when necessary.	Conduct site visits when necessary

The above may be updated based on the outcome of the Environmental process should additional responsibilities be identified.

9. IMPACT MANAGEMENT ACTIONS AND OUTCOMES

9.1 Pre-construction Phase

9.1.1 Site preparation

This section deals with the issues relative to site preparation during the pre-construction phase.

Table 17: Site preparation

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
Appointment of ECO	<ul style="list-style-type: none"> Appoint an Environmental Control Officer. The ECO or a responsible appointed person or site manager should contact a bat specialist before construction commences so that they know what to look out for during construction. 	Holder of the EA	Undertake regular audits	<p>Avoid construction delays.</p> <p>Ensure the EMPr is adhered to.</p>	Continuous
Site demarcation	<ul style="list-style-type: none"> Before construction begins, all areas to be developed must be clearly demarcated with fencing or orange construction barrier where applicable. All Construction Camps are to be fenced off in such a manner that unlawful entry is prevented, and access is controlled. All access points to the Construction Camp should be controlled by a guard or otherwise monitored, to prevent unlawful access. Records of all environmental incidents (in line with Section 30 of NEMA, 1998) must be maintained and a copy of these records be made available to provincial department on request throughout the project execution. 	Contractor	Undertake regular audits	<p>Prevent unauthorized impact on the environment.</p> <p>Ensure safety of the workers, public and prevent loss/damage to equipment.</p> <p>Ensure the conditions of the EA are adhered to.</p> <p>Compliance to all legislative requirements.</p>	Continuous
Site clearing	<ul style="list-style-type: none"> Site clearing must take place in a phased manner, as and when required. Areas which are not to be constructed on within two months must not be cleared to reduce erosion risks. The area to be cleared must be clearly demarcated and this footprint strictly maintained. 	Holder of the EA/Contractor	Undertake regular audits	<p>Site establishment undertaken responsibly.</p> <p>Sensitive areas identified and avoided.</p>	Once off

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<ul style="list-style-type: none"> Spoil that is removed from the site must be removed to an approved spoil site or a licensed landfill site. The necessary silt fences and erosion control measures must be implemented in areas where these risks are more prevalent. Storm water must be managed in such a manner as to disperse runoff and to prevent the concentration of storm water flow. Storm water must be managed in such a manner as to disperse runoff and to prevent the concentration of storm water flow. 			<p>Erosion management plan implemented and hydrological measures in place.</p> <p>Appropriate stormwater structures as informed by the Storm Water Management Plan</p>	
Construction Camp	<ul style="list-style-type: none"> Site establishment shall take place in an orderly manner and all required amenities shall be installed at camp sites before the main workforce move onto site. All construction equipment must be stored within the construction camp. All associated oil changes etc. (no servicing) must take place within the camp over a sealed surface such as a concrete slab. An area for the storage of hazardous materials must be established that conforms to the relevant safety requirements and that provides for spillage prevention and containment All Construction Camps shall be provided with portable fire extinguishing equipment, in accordance with all relevant legislation and must be readily accessible. The Contractor must provide sufficient ablution facilities, in the form of portable / VIP toilets, at the Construction Camps, and shall conform to all relevant health and safety standards and codes. No pit latrines, French drain systems or soak away systems shall be allowed and toilets may not be situated within 100 meters of any surface water body or 1:100-year flood line. A sufficient number of toilets shall be provided to accommodate the number of personnel working in the area. The Contractor shall inform all site staff to make use of supplied ablution facilities and under no circumstances shall indiscriminate sanitary activities be allowed. 	Contractor	Undertake regular audits	<p>Prevent unauthorized impact on the environment.</p> <p>Ensure safety of the public and prevent loss/ damage equipment.</p> <p>Ensure EMP is adhered to.</p> <p>Compliance to all legislative requirements</p>	Continuous

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<ul style="list-style-type: none"> No fires will be allowed and the Contractor must make alternative arrangements for heating. LP Gas may be used, provided that all required safety measures are in place. The Contractor shall take specific measures to prevent the spread of fires, caused by activities at the campsites. These measures may include appropriate instruction of employees about fire risks and the construction of firebreaks around the site perimeter. 				
Training of site staff	<ul style="list-style-type: none"> Environmental awareness training for construction staff, concerning at a minimum the general environmental awareness, conservation of fauna and flora, the prevention of accidental spillage of hazardous chemicals and oil; pollution of water resources (both surface and groundwater), air pollution and litter control and identification of archaeological artefacts. Staff operating equipment (such as loaders, etc.) shall be adequately trained and sensitised to any potential hazards associated with their tasks. No operator shall be permitted to operate critical items of mechanical equipment without having been trained by the Contractor and certified competent by the Project Manager. Staff should be educated as to the need to refrain from indiscriminate waste disposal and/or pollution of local soil and water resources and receive the necessary safety training. Staff must be trained in the hazards and required precautionary measures for dealing with these substances. Spillage packs must be available at construction areas. 	Contractor	Undertake regular audits	<p>All staff members are aware of the EMPr requirements relevant to them.</p> <p>All waste managed according to approved the Method Statement compiled by the contractor and approved by the engineer and reviewed by ECO.</p>	Continuous

9.1.2 Consultation

This section deals with the issues relative to consultation during the pre-construction phase.

Table 18: Consultation

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
Consultation	<ul style="list-style-type: none"> • Provide a mechanism through which information could be exchanged between the project proponent and stakeholders. • Identify relevant stakeholders and engage them at applicable stages of the process. • Inform the public about the proposed construction process. • Surrounding communities must be kept informed, through the identified and agreed consultation channels, of the commencement of construction. • Work on site to be restricted to work hours. • Financial provision must be included for rehabilitation in terms of the Renewable Independent Power Producer Programme (REIPPP) financial model requirements. • An agreement/contract should be formalised between the landowner and the applicant, that will ensure that the rehabilitation does not leave any liability to future landowners. 	Holder of the EA/ Contractor	Clear communication channels established	Continuous

9.1.3 Terrestrial

This section deals with the issues relative to terrestrial biodiversity during the pre-construction phase.

Table 19: Terrestrial

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Vegetation Loss	<ul style="list-style-type: none"> Blanket clearing of vegetation must be limited to the site. No clearing outside of footprint to take place. The boundaries of the development footprint areas are to be clearly demarcated and it must be ensured that all activities remain within the demarcated footprint area. Topsoil must be striped and stockpiled separately during site preparation and replaced on completion where revegetation will take place. Erosion prevention is key thus runoff must be controlled and managed by use of proper stormwater management measures. Any site camps and laydown areas requiring clearing must be located within already disturbed areas away from sensitive areas. 	Holder of EA / Project Manager	Adhere to impact management actions.	To minimize vegetation loss	Planning and Design phase prior to construction commencing
Loss of flora SCC	<ul style="list-style-type: none"> A flora walkdown is required for permit applications prior to commencement of construction activities. Respective permits to be obtained beforehand. Provincially protected species can be replanted and re-established post construction. 	Holder of EA	To adhere to impact management actions	To minimize loss of flora SCC	Prior to construction commencing

9.1.4 Agriculture

This section deals with the issues relative to the agricultural landscape during the pre-construction phase.

Table 20: Agricultural

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Protection of soil resources – Erosion	Design an effective system of storm water run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion.	Holder of the EA	Ensure that the storm water run-off control is included in the engineering design.	That disturbance and existence of hard surfaces causes no erosion on or downstream of the site.	Once-off during the design phase.

9.1.5 Social

This section deals with the issues relative to the social environment during the pre-construction phase.

Table 21: Social

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Social / Socio-Economic Nature: employment and business opportunities	<ul style="list-style-type: none"> Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase. Liaise with the Hantam Municipality to identify potential opportunities in this regard. 	Holder of EA / Contractor	Stakeholder Engagement Plan (SEP)	Maximize local community employment benefits in the local economy.	On-going

9.1.6 Transportation

This section deals with issues relative to transportation aspects during the pre-construction phase.

Table 22: Transportation

ASPECT / IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES / FREQUENCY
Increase in road traffic.	Identify type and condition of affected roads.	Developer	Transportation study	Establish baseline	Once off
	Deduce current traffic			Establish baseline conditions	
	Deduce expected additional traffic			Understand extent of impact	
	Confirm ability of existing road network to absorb additional traffic.			Ensure containment of impact.	
Increase in traffic incidents with pedestrians and livestock.	Assess current pedestrian conditions.	Developer	Transportation study	Establish baseline	Once off
	Confirm ability of existing road network to safely accommodate pedestrians.			Ensure containment of impact	Once off
Traffic disruptions and road damage due to abnormal loads	Identify required abnormal loads.	Developer	Transportation study, Abnormal Load study	Understand extent of impact	Once off
	Identify suitable routes.		Transportation study	Ensure containment of impact	Once off
	Apply for abnormal load permits with the relevant authorities		Application	Ensure containment of impact	Once off
Access and internal roads	Assess suitability of existing accesses and internal roads.	Developer	Transportation study	Establish baseline	Once off
	Design accesses and internal roads as per applicable criteria and standards.		Civil engineering design	Ensure containment of impact	Once off
	Design access and internal roads to minimize earthworks.			Reduction of environmental disturbance	Once off
	Design access and internal roads to minimise stormwater damage.			Reduction of environmental disturbance	Once off

ASPECT / IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES / FREQUENCY
	Submit access and road designs for approval with relevant authorities prior to construction.		Application	Ensure compliance	Once off

9.2 Construction Phase

9.2.1 Construction Camp

This section deals with the issues relative to the construction camp during the construction phase.

Table 23: Construction Camp

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAME
Construction Camp: Site of construction camp	<ul style="list-style-type: none"> The size of the construction camp must be aligned to the approved laydown area. Adequate parking must be provided for site staff and visitors. The Contractor must attend to drainage of the camp site to avoid standing water and / or sheet erosion. Suitable control measures over the Contractor's yard, plant and material storage to mitigate any visual impact of the construction activity must be implemented. No construction should occur in an area of high or unique agricultural value, or in an area under cultivation. 	Holder of the EA/Contractor	<p>Ensure the conditions of the EA are adhered to.</p> <p>Compliance to all legislative requirements.</p> <p>Impacts avoided or managed as per specialist recommendations.</p>	Once-off
Construction Camp: Storage of materials (including hazardous materials)	<ul style="list-style-type: none"> Choice of location for storage areas must take into account prevailing winds, distances to water bodies, general onsite topography and water erosion potential of the soil. Impervious surfaces must be provided where necessary. Storage areas must be designated, demarcated and fenced if necessary. Storage areas should be secure so as to minimize the risk of crime. They should also be safe from access by unauthorised persons i.e. children / animals etc. Fire prevention facilities must be present at all storage facilities. 	Holder of the EA/Contractor	<p>Choice of storage areas carefully considered to avoid impact to environment.</p> <p>Correct handling, storage and/or disposal and/or cleanup of all materials to prevent impact to environment.</p>	Continuous

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAME
	<ul style="list-style-type: none"> • Storage areas containing chemical substances / materials must be clearly sign posted. • Proper storage facilities for the storage of oils, paints, grease, fuels, chemicals and any hazardous materials to be used must be provided to prevent the migration of spillage into the ground and groundwater regime around the temporary storage area(s). These pollution prevention measures for storage must include a bund wall high enough to contain at least 110% of any stored volume, and this must be sited away from drainage lines in a site with the approval of the Project Manager. The bund wall must be high enough to contain 110% of the total volume of the stored hazardous material with an additional allocation for potential stormwater events. • These storage facilities (including any tanks) must be on an impermeable surface that is protected from the ingress of storm water from surrounding areas and that will not infiltrate into the ground in order to ensure that accidental spillage does not pollute local soil or water resources. • All fuel storage areas must be roofed to avoid creation of dirty stormwater • Material Safety Data Sheets (MSDSs) shall be readily available on site for all chemicals to be used on site. Where possible the available, MSDS's must additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases or escapes. • Staff dealing with these materials / substances must be aware of their potential impacts and follow the appropriate safety measures. • An approved waste disposal contractor must be employed to remove and recycle waste oil, if practical. The contractor must ensure that its staff is made aware of the health risks associated with any hazardous substances used and has been provided with the appropriate protective clothing/equipment in case of spillages or accidents and have received the necessary training. • All excess cement and concrete mixes are to be contained on the construction site prior to disposal off site. • All major spills as specified in the contractor emergency response procedure of any materials, chemicals, fuels or other potentially hazardous or pollutant 		All hazardous substances managed according to approved Method Statement.	

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAME
	substances must be cleaned immediately and the cause of the spill investigated. Preventative measures must be identified and submitted to the MC and ECO for information. Emergency response procedures to be followed and implemented.			
Construction Camp: Drainage of construction camp	<ul style="list-style-type: none"> • Surface drainage measures must be established in the Construction Camps so as to prevent <ul style="list-style-type: none"> ○ Ponding of water; ○ Erosion as a result of accelerated runoff; and, ○ Uncontrolled discharge of polluted runoff. 	Holder of the EA/Contractor	<p>Appropriate stormwater structures as informed by the Storm Water Management Plan</p> <p>Storm Water Management Plan implemented.</p> <p>Erosion plan implemented and hydrological measures in place.</p>	Continuous

9.2.2 Environmental Education and Training

This section deals with the issues relative to environmental education and training during the construction phase.

Table 24: Environmental Education and Training

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
Environmental Education and Training: Environmental Training	<ul style="list-style-type: none"> • Ensure that all site personnel have a basic level of environmental awareness training. The Contractor must submit a proposal for this training to the ECO for approval. Translators are to be used where necessary. Topics covered should include: <ul style="list-style-type: none"> ○ What is meant by “Environment” ○ Why the environment needs to be protected and conserved ○ How construction activities can impact on the environment ○ What can be done to mitigate against such impacts 	Contractor	Thorough induction to site.	Continuous

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Prepared by:



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 Description Lesaka 1 SEF EMPr
 Revision No. 0.1

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ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<ul style="list-style-type: none"> ○ Awareness of emergency and spills response provisions ○ Social responsibility during construction e.g. being considerate to local residents ● It is the Contractor's responsibility to provide the site foreman with no less than 1 hour's environmental training and to ensure that the foreman has sufficient understanding to pass this information onto the construction staff. ● Training should be provided to the staff members in the use of the appropriate fire-fighting equipment. ● Use should be made of environmental awareness posters on site. ● The need for a "clean site" policy also needs to be explained to the workers. ● Staff operating equipment (such as loaders, etc.) shall be adequately trained and sensitized to any potential hazards associated with their tasks. 			
Environmental Education and Training: Monitoring of environmental training	<ul style="list-style-type: none"> ● The Contractor must monitor the performance of construction workers to ensure that the points relayed during their introduction have been properly understood and are being followed. If necessary, the ECO and / or a translator should be called to the site to further explain aspects of environmental or social behaviour that are unclear. Toolbox talks are recommended. 	Contractor	Thorough induction to site.	Continuous

9.2.3 Waste Management

This section deals with the issues relative to waste management during the construction phase.

Table 25: Waste Management

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
Waste Management: Litter management/ general waste	<ul style="list-style-type: none"> ● Refuse bins must be placed at strategic positions to ensure that litter does not accumulate within the construction site. 	Contractor The EO shall monitor the neatness of the	All waste managed according to approved Method Statement	Continuous

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IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<ul style="list-style-type: none"> • The Contractor shall supply waste collection bins where such is not available and all solid waste collected shall be disposed of at registered/licensed landfill. • A housekeeping team should be appointed to regularly maintain the litter and rubble situation on the construction site. • If possible and feasible, all waste generated on site must be separated into glass, plastic, paper, metal and wood and recycled. An independent contractor can be appointed to conduct this recycling. • Where vegetation is cleared and is suitable, chipping and/or mulching can be considered. • Littering by the employees of the Contractor shall not be allowed under any circumstances. • Skip waste containers should be maintained on site. These should be kept covered and arrangements made for them to be collected regularly. • Any putrescible waste must be stored in containers that can keep out scavengers such as baboons and birds to prevent the spread of litter. • All waste must be removed from the site and transported to a landfill site promptly to ensure that it does not attract vermin or produce odours. • Waste needs to be collected and disposed of at a registered municipal site during and after construction, and written agreement should be provided to the Free State region Department of Water and Sanitation. • Storm water must be managed in such a manner as to disperse runoff and to prevent the concentration of storm water flow. • The Contractor shall provide a method statement with regard to waste management. • A certificate of disposal shall be obtained by the Contractor and kept on file, if relevant. • Under no circumstances may solid waste be burnt on site. • All waste must be removed promptly to ensure that it does not attract vermin or produce odours. 	<p>work sites as well as the Contractor campsite.</p>		

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
Waste Management: Hazardous waste	<ul style="list-style-type: none"> All waste hazardous materials, if present, must be carefully and appropriately stored, and then disposed of off-site at a licensed landfill site, where practical. Contaminants to be stored safely to avoid spillage. Machinery must be properly maintained to keep oil leaks in check All necessary precaution measures shall be taken to prevent soil or surface water pollution from hazardous materials used during construction and any spills shall immediately be cleaned up and all affected areas rehabilitated. 	Contractor	All waste managed according to approved Method Statement	Continuous
Waste Management: Sanitation	<ul style="list-style-type: none"> The Contractor shall install mobile chemical toilets on the site. The construction of "Long Drop" toilets are forbidden. Rather, portable toilets are to be used. Staff shall be sensitised to the fact that they should use these facilities at all times. No indiscriminate sanitary activities on site shall be allowed. Under no circumstances may open areas, neighbours fences or the surrounding bush be used as a toilet facility. Ablution facilities shall be within proximity from workplaces and not closer than 100m from any natural water bodies or boreholes. There should be enough toilets available to accommodate the workforce (minimum requirement 1: 15 workers). Male and females must be accommodated separately where possible. Toilets shall be serviced regularly and the ECO shall inspect toilets regularly. Potable water must be provided for all construction staff. 	Contractor	Staff members aware of EMPr requirements and ablutions used and maintained accordingly	Continuous
Waste Management: Remedial Actions	<ul style="list-style-type: none"> In the event of an accidental spill or leakage of hazardous substances, such incident(s) must be reported to all relevant authorities, including the Directorate: Pollution and Chemicals Management, in accordance with section 30(5) of the NEMA, 1998 pertaining to the control of incidents. Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated on-site. Excavation of contaminated soil must involve careful removal of soil using appropriate tools/machinery to storage containers until treated or disposed of at a licensed hazardous landfill site. 	Contractor	All waste managed according to approved Method Statement	Continuous

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<ul style="list-style-type: none"> The precise method of treatment for polluted soil must be identified by a suitable specialist. This could involve the application of soil absorbent materials as well as oil-digestive powders to the contaminated soil. If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent material. If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure. Materials used for the remediation of petrochemical spills must be used according to product specifications and guidance for use. Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment and stored in adequate containers until appropriate disposal. 			

9.2.4 Aquatic

This section deals with the issues relative to aquatic biodiversity during the construction phase.

Table 26: Aquatic

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Erosion control and sedimentation	<p>To monitor the extent of erosion and sedimentation of the freshwater ecosystems. Provide a report addressing the following:</p> <ul style="list-style-type: none"> Brief indication of the method of assessment; Assumptions and Limitations must be listed; Photographs and GPS point locations taken of existing erosion prior to and post rehabilitation activities must be incorporated into the report; Any erosion observed must be discussed in detail; Map indicating where erosion is present; and 	Holder of EA	Adhere to impact management actions.	Reporting to be included as part of the annual ECO monitoring report and submitted to the competent authority.	Visual inspections must take place after rainfall events.

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
	<ul style="list-style-type: none"> Recommended mitigation and remediation actions should be presented and dates when remediation actions were undertaken. 				
Alien Invasive Species Plant Control	<p>Monitoring must be undertaken as per an Alien and Invasive plant species plan. This must include:</p> <ul style="list-style-type: none"> Visual inspections must take place monthly during the winter rainy season for three years after the completion of construction to monitor the establishment of alien or invasive plant species, specifically at the freshwater ecosystems in the vicinity of the buildable areas (1-4), but also surrounding the BESS and substation. 	Holder of EA	Adhere to impact management actions.	Reporting to be included as part of the annual ECO monitoring report and submitted to the competent authority.	<p>Monitoring must be undertaken as per an Alien and Invasive plant species plan. This must include:</p> <ul style="list-style-type: none"> Visual inspection of construction footprint areas once a month during the construction phase.
Revegetation	<p>To monitor the germination of AIPs at freshwater ecosystem road crossings and surrounding the buildable areas, BESS and substation. The report needs to address the following:</p> <ul style="list-style-type: none"> A list of species identified within the focus areas; Discuss the density of species; Fixed point photo (Taking photo at specific point within focus area where AIPs was identified); and Focus areas requiring AIP control and proposed AIP control measures. 	Holder of EA	Adhere to impact management actions.	Reporting to be included as part of the annual ECO monitoring report and submitted to the competent authority.	A vegetation assessment to be undertaken one year post rehabilitation (during the growing season) to ensure plant survival and to ensure that no AIPs are outcompeting indigenous species.

9.2.5 Terrestrial

This section deals with the issues relative to terrestrial biodiversity during the construction phase.

Table 27: Terrestrial

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Alien Invasive Species Invasion	<ul style="list-style-type: none"> Alien invasive species (AIS) and weeds must be removed from the site as per CARA/NEMBA requirements. A suitable AIS and weed management strategy to be implemented during construction and operation phases. After clearing and construction is completed, an appropriate cover may be required, should natural re-establishment of grasses not take place in a timely manner along road verges. This will also minimise dust. 	Holder of EA / Project Manager / ECO	Adhere to impact management actions	To minimize regeneration of AIS and weeds	Quarterly during the construction phase.

9.2.6 Avifauna

This section deals with the issues relative to avifauna during the construction phase.

Table 28: Avifauna

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Disturbance of bird roosts	As with other impacts, this impact can be mitigated by timing of any panel construction to not commence in November, December and January in order to avoid breeding periods of species within the sensitive drainage lines, wetlands and the general region.	Client Appointed ECO.	<ul style="list-style-type: none"> Drive Transects (species lists) – all species seen to be recorded along set transects to be driven during dawn till pre 10 am; and Walked Transects (species lists) – all species heard and seen to be recorded along set transects to be walked at dawn chorus. All variables acquired should be statistically and graphically compared to the available data and the original targeted baseline data. 	Loss/ decrease in any SCC parameter, unnatural decline (cannot be explained by stochastic weather changes) in species densities and/or richness. Similarly, positive changes (e.g. unusual presence in high densities of nomadic species such as	Twice weekly during construction.

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
			<p>Photographs should be taken of as many SCC observed in the field.</p> <ul style="list-style-type: none"> Quarterly reporting presenting data analysis results and mapping indicating locations of change. Specific reporting on negative change detection not directly attributable to Project activities (Solar Facility Operation) and their cause. All reporting to be accompanied by GIS shapefiles and any original photographs. 	Bustards or establishment of SCC breeding populations (not yet sighted), Large SCC Raptors and Secretary Bird) in species densities and/or richness that indicate disturbance. Rapid surveys of greater surrounding area should be conducted to attempt to determine cause of change detected.	
Disturbance due to noise such as, machinery movements and maintenance operations	As with other impacts, this impact can be mitigated by timing of any panel construction to not commence in November, December and January in order to avoid breeding periods of species within the sensitive drainage lines, wetlands and the general region.	Client Appointed ECO.	<ul style="list-style-type: none"> Drive Transects (species lists) – all species seen to be recorded along set transects to be driven during dawn till pre 10 am; and Walked Transects (species lists) – all species heard and seen to be recorded along set transects to be walked at dawn chorus. All variables acquired should be statistically and graphically compared to the available data and the original targeted baseline data. Photographs should be taken of as many SCC observed in the field. Quarterly reporting presenting data analysis results and mapping indicating locations of change. Specific reporting on negative change detection not directly attributable to Project activities (Solar Facility Operation) and their cause. All reporting to be accompanied by GIS shapefiles and any original photographs. 	Loss/ decrease in any SCC parameter, unnatural decline (cannot be explained by stochastic weather changes) in species densities and/or richness. Similarly, positive changes (e.g, unusual presence in high densities of nomadic species such as Bustards or establishment of SCC breeding populations (not yet sighted), Large SCC Raptors and Secretary Bird) in species densities and/or richness that indicate disturbance. Rapid surveys of greater surrounding area should be conducted to attempt to determine cause of change detected.	Twice weekly during construction.

9.2.7 Agriculture

This section deals with the issues relative to agriculture during the construction phase.

Table 29: Agriculture

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Protection of soil resources – Erosion	Implement an effective system of storm water run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion.	Environmental Control Officer (ECO)	Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water run-off control system and to specifically record the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.	That disturbance and existence of hard surfaces causes no erosion on or downstream of the site.	Every 2 months during the construction phase.
Protection of soil resources – Erosion	Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion.	Environmental Control Officer (ECO)	Undertake a periodic site inspection to record the occurrence of and re-vegetation progress of all areas that require re-vegetation.	That vegetation clearing does not pose a high erosion risk.	Every 4 months during the construction phase
Protection of soil resources – Topsoil loss	If an activity will mechanically disturb the soil below surface in any way, then any available topsoil should first be stripped from the entire surface to be disturbed and stockpiled for re-spreading during rehabilitation. During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface.	Environmental Control Officer (ECO)	Record GPS positions of all occurrences of below-surface soil disturbance (e.g. excavations). Record the date of topsoil stripping and replacement. Check that topsoil covers the entire disturbed area.	That topsoil loss is minimised	As required, whenever areas are disturbed.

9.2.8 Geotechnical

This section deals with the issues relative to the geotechnical environment during the construction phase.

Table 30: Geotechnical

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Disturbance and removal of rock and soil	Design access roads, platforms and post locations to minimise earthworks and levelling. The design must be based on high resolution ground contour information.	Design Team	Adhere to impact management actions	Reduce the need for large bulk earthworks and reduce the amount of spoiled material quantities.	Once
	Correct topsoil and spoil management.	Construction Contractor	Adhere to impact management actions	Stockpile organic rich topsoil during construction. Place topsoil on dead soil typically found at bulk earthworks areas.	Once
Soil Erosion	Avoid development in preferential drainage paths. Temporary berms and drainage channels to divert surface runoff where needed. Landscape and rehabilitate disturbed areas timeously (e.g. regressing). Use designated access and laydown areas only to minimize disturbance to surrounding areas.	Design Team / Construction Contractor	Adhere to impact management actions	Reduce the impact and intensity of soil erosion in areas where vegetation and natural drainage channels have been removed. Maintain site areas to reduce run-away rills and gullies	Once Monthly

9.2.9 Social

This section deals with the issues relative to the social landscape during the construction phase.

Table 31: Social

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAME/ FREQUENCY
Social / Socio-Economic Nature: employment and business opportunities	<ul style="list-style-type: none"> Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase. 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 contractors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria. 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. Liaise with the Hantam Municipality to identify potential opportunities in this regard. 	Holder of EA / Contractor	Stakeholder Engagement Plan (SEP)	Maximise local community employment benefits in the local economy.	On-going
Social / Socio-Economic Nature: family structures and social networks	<ul style="list-style-type: none"> Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase. Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase. The proponent and the contractor should implement an HIV/AIDS and COVID-19 awareness programme for all construction workers at the outset of the construction phase. Liaise with the Hantam Municipality to identify potential opportunities in this regard. 	Holder of EA / Contractor	Stakeholder Engagement Plan (SEP) Community Health, Safety and Security Plan (CHSSP)	Reduce the risk posed to local family structures and social network	On-going

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAME/ FREQUENCY
			HIV/AIDS and COVID-19 awareness programme		
Social / Socio-Economic Nature: safety of farmers and farm workers, livestock and damage to farm infrastructure	<ul style="list-style-type: none"> Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase. Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase. 	Holder of EA / Contractor	Stakeholder Engagement Plan (SEP) Community Health, Safety and Security Plan (CHSSP)	Reduce the risk to farm workers, livestock and infrastructure	On-going

9.2.10 Heritage

This section deals with the issues relative to heritage aspects during the construction phase.

Table 32: Heritage

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Impact to significant archaeology	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, burials or other categories of heritage resources are found during the proposed development, work must cease in the vicinity of the find and SAHRA must be alerted immediately to determine an appropriate way forward.	ECO	n/a	Conservation of significant resources	Daily
Impact to significant palaeontology	If Palaeontological Heritage is uncovered during surface clearing and excavations ECO should be informed immediately. Fossil discoveries ought to be protected and the ECO/site manager must report to South African Heritage Resources Agency (SAHRA) so that mitigation (recording and collection) can be carried out.	ECO	n/a	Conservation of significant resources	Daily

9.2.11 Visual

This section deals with issues relative to visual aspects during the construction phase.

Table 33: Visual

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Visual quality	Limit vegetation clearance and the footprint of construction to what is absolutely essential.	Contractor	<ul style="list-style-type: none"> Plan which areas require the clearance of vegetation. Only clear vegetation when works in the area will be undertaken 	Limited dust generation.	Throughout construction.
	Consolidate the footprint of the construction camp to a functional minimum.		Ensure that the construction camp is consolidated (in size) during the design phase	Small construction camp footprint.	
	Avoid excavation, handling and transport of materials which may generate dust under very windy conditions.		During very windy conditions cease excavation, handling and transportation of materials which may generate dust.	No dust generated by activities undertaken during very windy conditions.	
	Keep stockpiled aggregates and sand covered to minimise dust generation.		<ul style="list-style-type: none"> Stockpile all aggregate and sand. Keep stockpiles covered when not in use. 	No airborne dust entrained from stockpiles.	
	Keep construction site tidy.		Implement measures to keep the site tidy	No wind-blown litter originating from the site.	

9.2.12 Transportation

This section deals with issues relative to transportation aspects during the construction phase.

Table 34: Transportation

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Increase in road traffic	Group transportation of staff	Contractor	Planning	Reduce the magnitude of additional road traffic	Daily
	Stagger material, plant and equipment deliveries		Programming of works	Reduce the concentration of additional road traffic	Weekly
	Schedule deliveries for off-peak times			Reduce the concentration of additional road traffic	Weekly
	Adequate traffic law enforcement		Traffic management plan	Safely manage additional road traffic	Daily
Increase in traffic incidents with pedestrian and livestock	Reduce and control speed of vehicle	Contractor	Traffic management plan	Avoid incidents with pedestrians and livestock	Daily
	Safe accommodation of pedestrians			Avoid incidents with pedestrians	Daily
	Implement pedestrian safety initiatives		Social facilitation	Avoid incidents with pedestrians	Monthly
	Regularly maintain farm fences and access cattle grids		Inspections and communications	Avoid incidents with livestock	Monthly
Increase in road degeneration	Regularly conduct conditional assessments on gravel roads	Contractor	Visual inspections	Identify deterioration of local roads timeously	Monthly
	Implement a road maintenance programme under the auspices of the respective transport department	Contractor, local authority	Road maintenance	Reduce / address deterioration of local roads	Bi-annually
Addition of abnormal loads	Stagger abnormal load deliveries	Contractor	Programming of works	Reduce the disturbance of road users associated with the transporting of abnormal loads	
	Schedule abnormal load deliveries for off-peak time			Reduce the disturbance of road users associated with the transporting of abnormal loads	
	Ensure compliance with permits		Inspections	Safely manage abnormal loads	
	Adequate traffic law enforcement		Traffic management plan	Safely manage abnormal loads	

9.2.13 Risk

This section deals with the issues relative to risk aspects during the construction phase.

Table 35: Risk

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES /FREQUENCY
Environment: Emissions to air	<ul style="list-style-type: none"> Use dampening on roads etc. as per normal construction practices. PPE (dust masks) for specific construction workers. 	Holder of the EA/Contractor	Adhere to impact management actions	Limited dust generation.	Daily
Environment: Emissions to water	<ul style="list-style-type: none"> Normal construction site practices for preventing and containing fuels/paint/oil etc spills. Bunding under any temporary tanks, curbing under truck offloading areas and sealed surfaces (e.g., concrete) under truck parking area is particularly important. Spill clean-up procedures to be in place before commencing construction. Sewage and any kitchen liquids - containment and suitable treatment/disposal 	Holder of the EA/Contractor	Adhere to impact management actions	Protection of water resources	Daily
Environment: Emissions to earth	<ul style="list-style-type: none"> Packaging materials that will need to be disposed of after the entire system is connected and commissioned as well as after regular maintenance. Waste segregation (e.g., electronic equipment, chemicals) and management on the site. 	Holder of the EA/Contractor	Adhere to impact management actions	Reduction in environmental damage	Monthly
Environment: Waste of resources / BESS	<ul style="list-style-type: none"> Water usage to be monitored on site during construction. Handling protocols to be provided by battery supplier. End of Life plan needs to be in place before any battery containers enter the country as there may be damaged battery unit from day 1. Water management plan and spill containment plans to be in place. 	Holder of the EA/Contractor	Adhere to impact management actions End of Life Plan Water Management Plan Spill Containment Plan	Reduction in environmental damage	Daily

9.2.14 Hydrological

This section deals with the issues relative to the hydrological aspects during the construction phase.

Table 36: Hydrological

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAME/ FREQUENCY
Impeding or diverting the flow of water in a watercourse	Storm water management infrastructure development such as diversion berms channels and silt management through silt traps and silt fences.	Engineer/ Contractor/ ECO	Ensure berms, channels and silt traps are built in accordance with design specs, and their integrity is maintained	Diversion of surface/stream flow away from construction footprints, site camps, and laydown/storage areas	Initial construction / Monthly / After major rainfall event
Erosion from disturbed open ground areas, unconsolidated soil and stockpiles	All exposed soil, including stockpiles, must be protected for the duration of the construction phase with a suitable geotextile (e.g., Geojute or hessian sheeting).	Contractor / ECO	Inspect stockpiles and exposed ground areas, particularly during wind or rainy conditions	To prevent excessive erosion, and sedimentation of the receiving freshwater environment	Weekly / After major rainfall event
Contamination of the watercourses and down slope stream areas by spills of hydrocarbons from construction vehicles and workshop areas	Ensure adequate training of all machine operators and conduct daily checks on vehicles/machinery. Breakdowns to be fixed offsite. Spill kits to be readily available. Ongoing sampling/monitoring of nearby water resources.	Contractor/ ECO/ Water Scientist	Do spot checks on vehicle checklists / operational compliance. Collect & analyse. water quality parameters at specified monitoring points.	Water monitoring points should be located both upstream and downstream of the proposed development site to ensure any impacts can be identified with appropriate responsive mitigation measures implemented.	Monthly / After major spill event
Disturbance to natural vegetation cover	All footprint areas must remain as small as possible and vegetation clearing to be limited to what is absolutely essential to ensure as much indigenous vegetation is retained. Adequate re-vegetation to those disturbed areas.	ECO	Monitoring of grass germination and soil amelioration. Ensure that no natural vegetation on site is disturbed unnecessarily.	To ensure adequate and fast surface coverage, to minimise erosion potential.	Weekly

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAME/ FREQUENCY
An increase in impervious areas	All excavated areas must be compacted to natural soil compaction levels to prevent the formation of preferential surface flow paths and subsequent erosion. Conversely, areas compacted as a result of construction must be loosened to natural soil compaction levels.	ECO	Non-footprint areas to be assessed for adequate rehabilitation. Grass berms around solar infrastructure to be closely monitored.	To reduce the impact and erosive potential of water flowing off hardened surfaces.	Weekly

9.3 Operational Phase

9.3.1 Operation and Maintenance

This section deals with the issues relative to operation and maintenance during the operation phase.

Table 37: Operation and Maintenance

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
Operation and Maintenance: Maintenance	<ul style="list-style-type: none"> All applicable standards, legislation, policies and procedures must be adhered to during operation. Regular ground inspection of the plants must take place to monitor their status. Compile and adhere to a procedure for the safe handling of battery cells. Lithium-ion batteries must have battery management systems (containment, automatic alarms, and shut-off systems) to monitor and protect cells from overcharging or damaging conditions, such as temperature extremes. Compile an Emergency Response Plan for implementation in the event of a spill or leakage. Record and report all significant fuel, oil, hydraulic fluid, or electrolyte spills or leaks so that appropriate clean-up measures can be implemented. A copy of these records must be made available to authorities on request throughout the project lifecycle. 	Holder of the EA	Ensure the conditions of the EA are adhered to. Compliance to all legislative requirements	During operation

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<ul style="list-style-type: none"> Frequent and appropriate disposal of both general and hazardous waste must be undertaken to prevent pollution of soil and groundwater. Install leak detection monitoring systems where possible. On-site battery maintenance should only be undertaken on impermeable surfaces with secondary containment measures. Any resulting hazardous substances must be disposed of appropriately. Provide for suitable emergency and safety signage on site, and demarcation of any areas which may pose a safety risk (including hazardous substances). Emergency numbers for the local police, fire department and Eskom must be placed in a prominent clearly visible area on-site 			
Operation and Maintenance: Public awareness	<ul style="list-style-type: none"> The emergency preparedness plan must be ready for implementation at all times should an emergency situation arise. 	Holder of the EA	Adhere to Emergency Evacuation Plan	During operation

9.3.2 Waste Management

This section deals with the issues relative to waste management during the operation phase.

Table 38: Waste Management

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAME
Waste Management: Recycling and litter management	<ul style="list-style-type: none"> The site should be kept clear of litter at all times. Solid waste separation and recycling should take place for the duration of the operational phase for the development at the administration block. Where vegetation is cleared and is suitable, chipping and/or mulching can be considered. Any putrescible waste must be stored in containers that can keep out scavengers such as baboons and birds to prevent the spread of litter. All waste must be removed promptly to ensure that it does not attract vermin or produce odours. 	Holder of EA	All waste managed according to approved Method Statement Compliance to all legislative requirements.	Continuous

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAME
	<ul style="list-style-type: none"> • Solid waste should be collected on a regular basis • Waste needs to be collected and disposed of at a registered municipal site during and after construction, and written agreement should be provided to the Free State region of Department of Water and Sanitation. 			

9.3.3 Aquatic

This section deals with the issues relative to aquatic biodiversity during the operation phase.

Table 39: Aquatic

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Erosion and sedimentation	<p>To monitor the extent of erosion and sedimentation of the freshwater ecosystems. Provide a report addressing the following:</p> <ul style="list-style-type: none"> • Brief indication of the method of assessment; • Assumptions and Limitations must be listed; • Photographs and GPS point locations taken of existing erosion prior to and post rehabilitation activities must be incorporated into the report; • Any erosion observed must be discussed in detail; • Map indicating where erosion is present; and • Recommended mitigation and remediation actions should be presented and dates when remediation actions were undertaken. 	Holder of EA	Adhere to impact management actions	Reporting to be included as part of the annual ECO monitoring report and submitted to the competent authority.	Visual inspections must take place monthly during the winter rainy season for three years after the completion of construction to monitor and remove debris, sediment deposits and erosion along the freshwater ecosystem crossings.

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Alien Invasive Species Plant Control	Monitoring must be undertaken as per an Alien and Invasive plant species plan. This must include: <ul style="list-style-type: none"> Visual inspections must take place monthly during the winter rainy season for three years after the completion of construction to monitor the establishment of alien or invasive plant species, specifically at the freshwater ecosystems in the vicinity of the buildable areas (1-4), but also surrounding the BESS and substation. 	Holder of the EA	Adhere to impact management actions	Reporting to be included as part of the annual ECO monitoring report and submitted to the competent authority.	Monitoring must be undertaken as per an Alien and Invasive plant species plan. This must include: <ul style="list-style-type: none"> Visual inspections must take place monthly during the winter rainy season for three years after the completion of construction to monitor the establishment of alien or invasive plant species, specifically at the freshwater ecosystems in the vicinity of the buildable areas (1-4), but also surrounding the BESS and substation.
Revegetation	To monitor the reinstatement of vegetation. The report needs to address the following: <ul style="list-style-type: none"> A list of species occurring within the focus areas; Discuss the density of species; Fixed point photo (Taking photo at specific point within focus area to identify the success of revegetation; and Focus areas requiring remedial action and proposed corrective actions. 	Holder of the EA	Adhere to impact management actions	Reporting to be included as part of the annual ECO monitoring report and submitted to the competent authority.	A vegetation assessment to be undertaken one year post rehabilitation (during the growing season) to ensure plant survival and to ensure that no AIPs are outcompeting indigenous species.

9.3.4 Terrestrial

This section deals with the issues relative to terrestrial biodiversity during the operation phase.

Table 40: Terrestrial

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Alien Invasive Species Invasion	<ul style="list-style-type: none"> • Alien invasive species (AIS) and weeds must be removed from the site as per CARA/NEMBA requirements. • A suitable AIS and weed management strategy to be implemented during construction and operation phases. • After clearing and construction is completed, an appropriate cover may be required, should natural re-establishment of grasses not take place in a timely manner along road verges. This will also minimise dust. 	Holder of EA/ Project Manager / ECO	Adhere to impact management actions	To minimise regeneration of AIS and weeds	Annually during the operational phase.
Rehabilitation of bare and exposed areas	<ul style="list-style-type: none"> • Minimise any disturbance of areas undergoing rehabilitation. • Use plant species that are indigenous to the vegetation type and that were found there before the construction process. This will increase the likelihood of the area's functional integrity to return to a state similar to that of before the Construction Phase. 	Holder of EA/ Project Manager / ECO	Adhere to impact management actions	To avoid degradation of the environment and regenerate habitat	Life of Rehabilitation

9.3.5 Avifauna

This section deals with the issues relative to avifauna during the operation phase.

Table 41: Avifauna

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES /FREQUENCY
Bird mortalities	Impacts due to bird mortalities during the operational phase are practically unavoidable for any large facility, but with the appropriate mitigation measures these impacts can be minimised. It is likely that most of the avifaunal populations will be largely displaced from the majority of the project infrastructure, although significant risks are associated with the likelihood of project vehicles flushing birds into fencing infrastructure as well as collisions of large bodied species with powerlines. Although the current overall bird activity qualifies the proposed solar development boundary as a high-density area, there are certain times of the year (and day) when it appears that large flocks of birds (such as cranes, bustards and large birds of prey) are far more prevalent. All powerline infrastructure must be fitted with approved bird diverters in order to provide visibility for large-bodied birds. In all areas where service road intersects with semi natural or natural habitat, all fences must be set back at least (strictly) 75 metres from the edge of every service road in order to allow for vulnerable species such as bustards, raptors and korhaans to obtain adequate height after being flushed by vehicle traffic. An Alternative mitigation measure and where a 75-metre buffer is not possible, new fences must be set back no more than 5 metres (directly adjacent) from the edge of service roads. Through the essential elimination of habitat, this will limit any chance of vulnerable species	Company Appointed ECO, trained by SACNASP registered Zoologist.	<ul style="list-style-type: none"> For panel location sites: weekly inspection on foot of cleared areas for birds killed during the operation process. Location and species must be recorded (a georeferenced photograph as evidence is also required). Monthly reporting presenting data analysis results and mapping indicating locations of change. Specific reporting on negative change detection not directly attributable to Project activities (Solar Facility Operation) and their cause. All reporting to be accompanied by GIS shapefiles and any original photographs. 	Collision frequency and intensity (# kills per species per unit time) will need to be assessed per species by specialist. However, any non-specific collision concentrations (> 10 kills per month clustering in a stretch of powerline) must initiate investigation and corrective measures (including retrofitting of mitigation measures).	Weekly for panels between November and March.

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES /FREQUENCY
	foraging on verge side vegetation and causing subsequent fence collisions.				
<ul style="list-style-type: none"> Disruption of bird migratory pathways The attraction of some novel bird species due to the development of a solar farm with associated infrastructure such as lake effect, perches, nest and shade opportunities. Disturbance due to noise such as, machinery movements and maintenance operations. 	<ul style="list-style-type: none"> Migratory pathways of birds cannot be changed, and the resulting impacts are unavoidable. However, severity of the impacts can be reduced with appropriate mitigation measures. Some significant discernible migratory flight pathways were able to be established which could be explained by large areas of generic habitats punctuated by some distinguishing geographic features in the landscape, such as large ridges, large impoundments, wetlands and drainage lines. The linear drainage line habitats must be buffered in accordance with the EIA sensitivity mapping. Essentially, all habitat attractants should be eliminated so that avifaunal populations will not embedded themselves within the infrastructure over time. This includes bird diverters, perch deterrents and the application of Non-polarising white tape can be used around and/or across panels to minimise reflection which can attract aquatic birds and insects (food) as panels mimic reflective surfaces of waterbodies. 	Company Appointed ECO, trained by a SACNASP registered Zoologist.	<ul style="list-style-type: none"> For panel location sites: Monthly inspection using Drive and Walking Transects. CWAC counts 	Species inventories and passage rate data collection.	Monthly SCC and species inventories during November, December, January and February
Chemical pollution	<ul style="list-style-type: none"> The application of strict chemical control protocols 	Company appointed ECO.	<ul style="list-style-type: none"> For panel location sites: weekly inspection on foot Yearly soil analysis sent to accredited lab 	<ul style="list-style-type: none"> Spill Records Yearly chemical analysis results matched to prescribed thresholds 	Weekly spill detection for panels

9.3.6 Agriculture

This section deals with the issues relative to the agriculture landscape during the operation phase.

Table 42: Agriculture

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Protection of soil resources – Erosion	Maintain the storm water run-off control system. Monitor erosion and remedy the storm water control system in the event of any erosion occurring.	Facility Environmental Manager	Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water run-off control system and to specifically record the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.	That existence of hard surfaces causes no erosion on or downstream of the site.	Bi-annually
Protection of soil resources – Erosion	Facilitate re-vegetation of denuded areas throughout the site.	Facility Environmental Manager	Undertake a periodic site inspection to record the progress of all areas that require re-vegetation.	That denuded areas are re-vegetated to stabilise soil against erosion.	Bi-annually

9.3.7 Geotechnical

This section deals with the issues relative to the geotechnical landscape during the operation phase.

Table 43: Geotechnical

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Soil Erosion	Maintain access roads including drainage features. Monitor for erosion and remediate and rehabilitate timeously.	Operations team	Adhere to impact management actions	Maintain site areas to reduce run-away rills and gullies.	Monthly

9.3.8 Social

This section deals with the issues relative to the social landscape during the operation phase.

Table 44: Social

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAME/ FREQUENCY
Social / Socio-Economic Nature: improve energy security and support renewable sector	<ul style="list-style-type: none"> Implement a skills development and training programme aimed at maximizing the number of employment opportunities for local community members. Maximise opportunities for local content, procurement, and community shareholding. Liaise with the Hantam Municipality to identify potential opportunities in this regard. 	Holder of EA / Contractor	Skills development and training programme	Maximise local community employment benefits in the local economy.	On-going

9.3.9 Visual

This section deals with the issues relative to the visual landscape during the operation phase.

Table 45: Visual

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Altered sense of place and visual intrusion	Install the powerlines underground, where possible.	Developer	Incorporate underground powerlines in the design.	Reduced visual clutter interrupting views.	On completion of construction activities. Throughout operation phase.
	Fence the perimeter of the site with green or black fencing.		Install a perimeter fence.	The site is screened by the fence.	
	Ensure that the roof color of the proposed buildings blends into the landscape.		Incorporate color requirements in the design.	The roof visibly blends into the landscape.	

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Altered visual quality	Reduce the height of lighting masts to a workable minimum.	Developer and contractor	Incorporate lighting requirements in the design.	Limited light pollution caused by the SEF.	Once construction activities have concluded. Throughout operational phase.
	Direct lighting inwards and downwards to limit light pollution.				

9.3.10 Transportation

This section deals with the issues relative to the transportation during the operation phase.

Table 46: Transportation

APECT/IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Increase in road traffic	Group transportation of staff	Operator	Planning	Reduce the magnitude of additional road traffic	When required
Increase in traffic incidents with pedestrians and livestock	Safe accommodation of pedestrians	Operator	Monitoring	Avoid incidents with pedestrians	Weekly
	Reduce vehicle speed			Avoid incidents with pedestrians and livestock	Daily
	Regularly maintain farm fences and access cattle grids		Inspections and reporting	Avoid incidents with livestock	Monthly
Addition of abnormal loads	Schedule abnormal load deliveries for off-peak time	Operator	Programming of maintenance	Reduce the disturbance of road users associated with the transporting of abnormal loads	When required
	Ensure compliance with permits	Contractor	Inspections	Safely manage abnormal loads	When required
	Adequate traffic law enforcement		Traffic management plan	Safely manage abnormal loads	When required

9.3.11 Risk

This section deals with the issues relative to risk aspects during the operation phase.

Table 47: Risk

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Environment: Emissions to water	<ul style="list-style-type: none"> Bunding under any outdoors tanks, curbing under truck offloading areas and sealed surfaces (e.g., concrete) under truck parking area is particularly important. Sewage and any kitchen liquids - containment and suitable treatment/disposal. Procedures for dealing with damaged/leaking equipment as well as clean-up of spills. Normal site practices for preventing and containing diesel/paint etc spills. Waste management plan to be in place e.g., liquid waste treatment or suitable removal and disposal will be provided. Spill clean-up procedures to be in place before bringing container on site, including spill kits – non-combustible materials, hazmat disposal. The National Environment Management Act (NEMA) has a list of substances with Reportable spill Quantities, ensure compliance with this. 	Holder of the EA/Contractor	Adhere to impact management actions Water Management Plan Spill Containment Plan	Protection of water resources Compliance with National Environment Management Act (NEMA)	As required
Environment: Emissions to earth	<ul style="list-style-type: none"> Waste segregation (e.g., electronic equipment, chemicals) and management on the site. 	Holder of the EA/Contractor	Adhere to impact management actions	Reduction in environmental damage	Monthly
Environment: Waste of resources / BESS	<ul style="list-style-type: none"> Water usage to be monitored on site. Handling protocols to be provided by supplier of batteries. Water management plan and spill containment plans to be in place. Investigate end of Life plan for solid state batteries - reuse / recovery / reconditioning. 	Holder of the EA/Contractor	Adhere to impact management actions End of Life Plan	Reduction in environmental damage	Monthly

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
			Water Management Plan Spill Containment Plan		

9.3.12 Hydrological

This section deals with the issues relative to the hydrological aspects during the operation phase.

Table 48: Hydrological

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAME/ FREQUENCY
Natural vegetation disturbance/ loss resulting in the emergence of invasive alien vegetation.	Alien and invasive plant species identified must be removed and disposed of as per an Alien and Invasive Species Control Plan and the area must be revegetated with suitable indigenous vegetation.	ECO	Regular inspection of the area surrounding the surface infrastructure (proposed PV facility and grid connection infrastructure) should occur to monitor the establishment of vegetation, prevent the establishment of alien and invasive vegetation species, and their potential spread into the surrounding freshwater ecosystem.	Reintroduce indigenous vegetation during rehabilitation, to outcompete in emerging aliens. Ensure that invasive species do not become established on site and further impact freshwater systems.	Monthly
Contamination of the watercourses and down slope stream areas by spills from chemicals used to clean or maintain the facility's assets.	Ensure adequate training of all cleaning staff. conduct daily checks on cleaning equipment. Spill kits to be readily available. Ongoing sampling/monitoring of nearby water resources.	Contractor / ECO / Water Scientist	Do spot checks on cleaning equipment checklists / storage facilities. Collect & analyse water quality parameters at specified monitoring points.	Water monitoring points should be located both upstream and downstream of the proposed development site to ensure any	Monthly / After major spill event

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAME/ FREQUENCY
				impacts can be identified with appropriate responsive mitigation measures implemented.	
An increase in impervious areas, in the form of internal access roads and service infrastructure.	All footprint areas must remain as small as possible and vegetation clearing to be limited to what is absolutely essential to ensure as much indigenous vegetation is retained. Vegetated berms to be placed along the downslope of solar infrastructure, so slow the accelerated runoff from hardened surfaces.	ECO	Assess and document vegetation growth at the base of solar infrastructure. Record areas of erosion, subsidence, or soil loss. Ensure surface runoff is adequately channelled.	To reduce the rates of increased surface flow velocity, thus decreasing the risk of erosion and sediment reaching the natural water resources.	Monthly

9.4 Decommissioning Phase

9.4.1 Construction Site Decommissioning

This section deals with the issues relative to construction site decommissioning during the operational phase.

Table 49: Construction Site Decommissioning

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
Construction Site Decommissioning: Removal of equipment	<ul style="list-style-type: none"> All structures comprising the construction camp are to be removed from site. The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc., and these shall be cleaned up. All hardened surfaces within the construction camp area should be ripped, all imported materials removed, and the area shall be top soiled and regressed using the guidelines set out in the re-vegetation that forms part of this document. 	Holder of EA/ Contractor	<p>Compliance to all legislative requirements.</p> <p>Ensure the EMPr is adhered to.</p>	During decommissioning

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
Construction Site Decommissioning: Temporary services	<ul style="list-style-type: none"> The Contractor must arrange the cancellation of all temporary services. Temporary roads must be closed and access across these, blocked. All areas where temporary services were installed are to be rehabilitated to the satisfaction of the ECO. 	Holder of EA/ Contractor	<p>Compliance to all legislative requirements.</p> <p>Ensure the EMPr is adhered to.</p>	During decommissioning
Construction Site Decommissioning: Associated infrastructure	<ul style="list-style-type: none"> Surfaces are to be checked for waste products from activities such as concreting or asphaltting and cleared in a manner approved by the Engineer. All surfaces hardened due to construction activities are to be ripped and imported material thereon removed. All rubble is to be removed from the site to an approved disposal site as approved by the Engineer. Burying of rubble on site is prohibited. The site is to be cleared of all litter. The Contractor is to check that all watercourses are free from building rubble, spoil materials and waste materials. Fences, barriers and demarcations associated with the construction phase are to be removed from the site unless stipulated otherwise by the Engineer. All residual stockpiles must be removed to spoil or spread on site as directed by the Engineer. All leftover building materials must be returned to the depot or removed from the site. The Contractor must repair any damage that the construction works has caused to neighbouring properties, specifically, but not limited to, damage caused by poor storm water management. 	Holder of EA/ Contractor	All waste managed according to approved Method Statement	During decommissioning

9.4.2 On-going Stakeholder involvement

This is the process that is recommended when the proposed solar farms are decommissioned.

Table 50: On-going Stakeholder involvement

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT ACTIONS	TIMEFRAME
Ongoing Stakeholder Involvement	<ul style="list-style-type: none"> • Community to be notified, as culturally appropriate, timeously of the planned decommissioning, e.g.: <ul style="list-style-type: none"> ○ Proposed decommissioning start date; and ○ Process to be followed. • Recommend that a meeting with community leader(s) be held before decommissioning commence to inform them: <ul style="list-style-type: none"> ○ What activities will take place during the decommissioning phase. ○ How these activities will impact upon the communities and/or their properties. ○ Regarding the timeframes of scheduled activities • Regular interaction between the client and community leader(s) during the decommissioning phase. • A reporting office/ channel to be established should community members experience problems with contractors/ sub-contractors during the decommissioning phase. • A register to be kept of problems reported by community members and the steps taken to address / resolve it. 	Holder of the EA	Clear communication channels maintained	During decommissioning

9.4.3 Waste Management

This section deals with the issues relative to waste management during the decommissioning phase.

Table 51: Waste Management

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT ACTIONS	TIMEFRAME
Waste Management	<ul style="list-style-type: none"> • All decommissioned equipment must be removed from site and disposed of at a registered land fill. Records of disposal must be kept. 	Holder of the EA	All waste managed according to approved Method Statement	During decommissioning

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT ACTIONS	TIMEFRAME
	<ul style="list-style-type: none"> Any putrescible waste must be stored in containers that can keep out scavengers such as baboons and birds to prevent the spread of litter. Solar panels must be returned to the manufacturer or relevant recycling agent to be recycled. 			

9.4.4 Aquatic

This section deals with the issues relative to aquatic biodiversity during the decommissioning phase.

Table 52: Aquatic

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Alien Invasive Species Plant Control	<p>Monitoring must be undertaken as per an Alien and Invasive plant species plan. This must include:</p> <ul style="list-style-type: none"> Visual inspections must take place monthly during the winter rainy season for three years after the completion of construction to monitor the establishment of alien or invasive plant species, specifically at the freshwater ecosystems in the vicinity of the buildable areas (1-4), but also surrounding the BESS and substation. 	Holder of the EA	Adhere to impact management actions	Reporting to be included as part of the annual ECO monitoring report and submitted to the competent authority.	<p>Monitoring must be undertaken as per an Alien and Invasive plant species plan. This must include:</p> <ul style="list-style-type: none"> Visual inspection of decommission footprint areas once a month during the decommissioning phase.
Revegetation	<p>To monitor the reinstatement of vegetation. The report needs to address the following:</p> <ul style="list-style-type: none"> A list of species occurring within the focus areas; Discuss the density of species; Fixed point photo (Taking photo at specific point within focus area to identify the success of revegetation; and Focus areas requiring remedial action and proposed corrective actions. 	Holder of the EA	Adhere to impact management actions	Reporting to be included as part of the annual ECO monitoring report and submitted to the competent authority.	A vegetation assessment to be undertaken one year post rehabilitation (during the growing season) to ensure plant survival and to ensure that no AIPs are outcompeting indigenous species.

9.4.5 Terrestrial

This section deals with the issues relative to terrestrial biodiversity during the decommissioning phase.

Table 53: Terrestrial

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Alien Invasive Species Invasion	<ul style="list-style-type: none"> Alien invasive species (AIS) and weeds must be removed from the site as per CARA/NEMBA requirements. A suitable AIS and weed management strategy to be implemented during construction and operation phases. After clearing and construction is completed, an appropriate cover may be required, should natural re-establishment of grasses not take place in a timely manner along road verges. This will also minimise dust. 	Holder of EA/ Project Manager/ ECO	Adhere to impact management actions	To minimise regeneration of AIS and weeds	Once-off during the decommissioning phase.

9.4.6 Agriculture

This section deals with the issues relative to the agricultural landscape during the decommissioning phase.

Table 54: Agriculture

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Protection of soil resources – Erosion	Implement an effective system of storm water run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion.	Environmental Control Officer (ECO)	Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water run-off control system and to specifically record the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.	That disturbance and existence of hard surfaces causes no erosion on or downstream of the site.	Every 2 months during the decommissioning phase, and then every 6 months after completion of decommissioning, until final sign-off is achieved.

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Protection of soil resources – Erosion	Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion.	Environmental Control Officer (ECO)	Undertake a periodic site inspection to record the occurrence of and re-vegetation progress of all areas that require re-vegetation.	That vegetation clearing does not pose a high erosion risk.	Every 4 months during the decommissioning phase, and then every 6 months after completion of decommissioning, until final sign-off is achieved.
Protection of soil resources – Topsoil loss	If an activity will mechanically disturb the soil below surface in any way, then any available topsoil should first be stripped from the entire surface to be disturbed and stockpiled for re-spreading during rehabilitation. During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface.	Environmental Control Officer (ECO)	Record GPS positions of all occurrences of below-surface soil disturbance (e.g. excavations). Record the date of topsoil stripping and replacement. Check that topsoil covers the entire disturbed area.	That topsoil loss is minimized.	As required, whenever areas are disturbed.

9.4.7 Geotechnical

This section deals with issues relative to the geotechnical landscape during the decommissioning phase.

Table 55: Geotechnical

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Disturbance and removal of rock and soil	Restore natural site topography. Landscape and rehabilitate access roads and disturbed areas timeously (e.g. egressing).	Operations Team	Adhere to impact management actions	Reduce ponding of water and soil erosion by reinstating natural drainage channels.	Yearly

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Soil Erosion	Temporary berms and drainage channels to divert surface runoff where needed. Restore natural site topography. Use designated access and laydown areas only to minimize disturbance to surrounding areas.	Operations Team	Adhere to impact management actions	Reduce ponding of water and soil erosion by reinstating natural drainage channels. Maintain remaining access roads.	Yearly

9.4.8 Visual

This section deals with the issues relative to visual during the decommissioning phase.

Table 56: Visual

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Visual quality	Limited vegetation clearance and the footprint of decommissioning to what is absolutely essential.	Contractor	<ul style="list-style-type: none"> Plan which areas require the clearance of vegetation. Only clear the vegetation when works in the area will be undertaken. 	Limited clearance of exposed ground.	Throughout decommissioning
	Consolidate the footprint of the decommissioning camp to a functional minimum.		Ensure that the decommissioning camp footprint is consolidated where possible.	Reduced project footprint.	
	Avoid excavation, handling and transport of materials which may generate dust under very windy conditions.		During very windy conditions cease excavation, handling and transportation of materials which may generate dust	No dust generated by activities during very windy conditions.	
	Keep stockpiled aggregates and sand covered to minimise dust generation.		<ul style="list-style-type: none"> Stockpile all aggregates and sand. Keep stockpiles covered when not in use. 	No airborne dust entrained from stockpiles.	
	Keep site tidy.		Implement measures to keep the site tidy.	No wind-blown litter originating from the site.	

9.4.9 Risk

This section deals with the issues relative to the risks aspects during the decommissioning phase.

Table 57: Risk

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
Environment: Waste of resources / BESS	<ul style="list-style-type: none"> • End of Life shutdown procedure including a Risk Assessment of the specific activities involved. • Where possible re-purpose the solid-state batteries / containers and equipment with associated environmental impact considered. • Disposal according to local regulations and other directives such as the European Batteries Directive. • End of life, which is affected by temperature and time, cycles etc, should be predefined and the monitoring should be in place to determine if it has been reached. 	Holder of the EA/Contractor	Adhere to impact management actions End of Life Plan	Reduction in environmental damage	During decommissioning

9.4.10 Hydrological

This section deals with the issues relative to the hydrological aspects during the decommissioning phase.

Table 58: Hydrological

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAME/ FREQUENCY
Contamination of the watercourses and down slope stream areas by spills of hydrocarbons from an increase in decommissioning machinery or loading / transport vehicles.	Ensure adequate training of all machine operators and conduct daily checks on vehicles/machinery. Breakdowns to be fixed off-site. Spill kits to be readily available. Ongoing sampling/monitoring of nearby water resources.	Contractor / ECO / Water Scientist	Do spot checks on vehicle checklists / operational compliance. Collect & analyse water quality parameters at specified monitoring points	Water monitoring points should be located both upstream and downstream of the proposed development site to ensure any impacts can be identified with appropriate responsive mitigation measures implemented.	Monthly / After major spill event
Disturbance to the site's established vegetation cover, resulting in bare soil exposure, and thus increasing the risk of erosion and sediment reaching downstream drainage lines.	All excavated areas must be compacted to natural soil compaction levels to prevent the formation of preferential surface flow paths and subsequent erosion. Conversely, areas compacted as a result of construction activities must be loosened to natural soil compaction levels. Adequate re-vegetation to those disturbed areas.	ECO	Monitoring of grass germination and soil amelioration. Ensure that no natural vegetation on site is disturbed unnecessarily.	To ensure adequate and fast surface coverage, to minimise erosion potential.	Weekly

10. AMENDMENTS TO THE EMPR

The ECO has the right to request (in writing) a method statement to be compiled by the contractor in cases where the Construction EMPr may not adequately address the issue or nature of the activity/site warrants the need thereof. The method statement must be approved in writing by the ECO prior to carrying out the activity.

Any major issues not covered in the EMPr as submitted as well as any layout changes, will be addressed as an addendum to the EMPr and must be submitted for approval prior to implementation.

Authorised officials of the Department reserve the right to review the approved EMPr during the construction and operational phases of the above-mentioned activity and amend/add any condition as it is deemed necessary. Authorised officials also reserve the right to inspect the project during both construction and operational phase of development.

11. ENVIRONMENTAL AWARENESS PLAN

Appendix 4 of GN R326 EIA Regulations 2014 (as amended) requires that an Environmental Awareness Plan describes the manner in which “*the applicant intends to inform his or her employees of any environmental risk which may result from their work; and risks must be dealt with in order to avoid pollution or the degradation of the environment*”. In recognition of the need to protect our environment, environmental management should not only be seen as a legal obligation but also as a moral obligation.

This Environmental Awareness Plan is intended to create the required awareness and culture with personnel and contractor’s / service providers on environmental safety and health issues associated with the development activities.

11.1 Policy on Environmental Awareness

This Environmental Awareness Plan must serve as the basis for the induction of all new employees (as well as contractors depending on the nature of their work on site) on matters as described herein and read in conjunction with the EMPr. The Plan will also be used to hone awareness of all employees on a continuous basis.

Specific environmental awareness performance criteria will also form part of the job descriptions of employees, to ensure diligence and full responsibility at all levels of the organisational work force.

11.2 Implementation of Environmental Awareness

General environmental awareness will be fostered among the project's workforce to encourage the implementation of environmentally sound practices throughout the project’s duration. This will ensure that environmental accidents are minimised and environmental compliance maximised.

Environmental awareness will be fostered in the following manner:

- Induction course for all workers on site, before commencing work on site;
- Refresher courses as and when required;

- Daily toolbox talks with all workers on the site at the start of each day, where workers can be alerted to particular environmental concerns associated with their tasks for that day or the area/habitat in which they are working; and
- Displaying of information posters and other environmental awareness material at the general assembly points.

11.3 Training and awareness

The main contractor is to take responsibility for the management of their staff and subcontractors on the project site during the construction phase and supervise them closely at all times. The onus is on the contractor to make sure that all their staff and subcontractors fully comprehend the contents of the EMPr. The contractor must organise environmental awareness training programmes, which should be targeted at the two levels of employee: management and labour.

11.4 Training of construction workers

All construction staff must receive basic training in environmental awareness, including the storage and handling of hazardous substances, minimisation of disturbance to sensitive areas, management of waste, and prevention of water pollution. They must be informed of how to recognise historical / archaeological artefacts that may be uncovered. They must also be apprised of the EMPr's requirements. Environmental awareness training programmes need to be formulated for these employee levels and must comprise:

- A record of all names, positions and duties of staff to be trained;
- A framework for the training programmes;
- A summarised version of the training course(s); and
- An agenda for the delivery of the training courses.

Such programmes will set out the training requirements, which need to be conducted prior to any construction works occurring and will include:

- Acceptable behaviour with regard to flora and fauna;
- Management and minimising of waste, including waste separation;
- Maintenance of equipment to prevent the accidental discharge or spill of fuel, oil, lubricants, cement, mortar and other chemicals;
- Responsible handling of chemicals and spills;
- Environmental emergency procedures and incident reporting; and
- General code of conduct towards I&APs.

12. CONCLUSION

The environmental and social impacts of the project were identified through the four project phases (pre-construction, construction, operation and decommissioning). The following section briefly describes some of the major impacts and proposed mitigation measures within each of the project phases.

12.1 Pre-Construction Phase

The first site activities before mobilization of equipment will be a survey, required for final design of solar farm foundations. There will be negative impacts on land associated with the construction of camps (temporary loss) and storage of construction materials, and foundations for the buildings (permanent loss). Expectations of improvement in livelihood among locals should be addressed through public participation. Construction contracts will include environmental monitoring and management procedures and requirements. These must be in place prior to the commencement of any construction activities.

12.2 Construction Phase

This phase of the activity will have both positive and negative impacts. The positive impacts are employment opportunities offered to the construction workers and any other labourer who will be hired to provide their services during the construction phase. The negative impacts would include wastes generated, accidents, air, dust and noise pollution, vegetation clearance, soil erosion, socio-environmental issues, loss of vegetation, and compaction of soil. Most of the negative impacts are minor and temporary and the significance of the impacts can be greatly reduced by the implementation of mitigation measures, which are outlined in this EMP. The contractor shall ensure that all staff have adequate protective clothing and are adequately trained.

12.3 Operational Phase

The proposed project will have minimal negative effects which mainly relates to loss of aesthetic value and habitat. Most of the negative impacts are minor and the significance of the impacts can be greatly reduced by the implementation of mitigation measures, which are outlined in this EMP.

12.4 Decommissioning Phase

As with any project, the facilities used in this project will have a lifetime after which they may no longer be cost effective to continue with operation. At that time, the project would be decommissioned, and the existing equipment removed.

Potential environmental impacts caused during decommissioning are those, which will be mitigated as provided by the Environmental Management Programme. These include: noise and emissions to the surrounding environment, removal of hazardous waste and substances, fire, oil spills, wastes and public safety. The disposal of materials from the decommissioned plant is not viewed as high risk. Much of the material would be recyclable (steel structures and turbine engines etc.) or inert (concrete foundations, etc.). These materials would, however, need to be disposed of at a formal waste disposal or recycling centre.

Based on the above information, it is unlikely that the Project will have significant adverse social and environmental impacts. Most adverse impacts will be of a temporary nature during the construction phase and can be managed to acceptable levels with implementation of the recommended mitigation measures for the Project such that the overall benefits from the Project will greatly outweigh the few adverse impacts.

All the negative impacts could be easily mitigated and will either be moderate or less in rating. Generally, the proposed solar farm will result in appreciable benefits to the people in the project area of influence and bring opportunities for development to the country.



Appendix A:
Curriculum Vitae

CURRICULUM VITAE

Michelle Nevette

Name	Michelle Nevette
Profession	Environmentalist
Name of Firm	SiVEST SA (Pty) Ltd
Present Appointment	Divisional Manager: SiVEST Environmental Division
Years with Firm	21 Years
Date of Birth	18 March 1975
Nationality	South African



Professional Qualifications

- BA (Economics), Honours in Environmental Management
- MEnvMgt. (Environmental Management) - University of South Africa
- ISO 14001:2015 Introduction and Implementation of an EMS (03/2018)
- Cert.Nat.Sci. reg. No. 120356 (July 2020)

Membership to Professional Societies

- International Association for Impact Assessment South Africa (IAIAsa)
- Environmental Assessment Practitioners Association of South Africa (EAPSA) Reg No.2019/1560
- South African Council for Natural Scientific Professions (SACNASP) Cert. Sci.Nat. Reg No. 120356

Employment Record

Aug 2009 – to date	SiVEST SA (Pty) Ltd Environmental Division: Divisional Manager
April. 1999 – Aug 2009	SiVEST Environmental Division: Senior Environmental Project Manager

Language Proficiency

LANGUAGE	SPEAK	READ	WRITE
English	Fluent	Fluent	Fluent
Afrikaans	Good	Good	Good

Years of Working Experience: 21 years

Countries of Working Experience

- South Africa
- Zimbabwe

Fields of Specialisation

- Environmental Project Management
- Environmental Impact Assessment
- Environmental Management and Auditing
- Environmental Planning including ISO14001:2015

CURRICULUM VITAE

Michelle Nevette

Overview

Michelle's strong managerial skills have been extensively used in setting up and running projects and in establishing and monitoring documentation systems. Responsible for the management of a team of environmental impact assessment practitioners, including financial management of the division in conjunction with the Managing Director, and ongoing responsibilities on various environmental projects.

Michelle has a keen interest in strategic planning and has been responsible for undertaking Strategic Environmental Assessments and for preparing Integrated Environmental Management Programs and Environmental Management Frameworks for various municipalities and private developers. Extensive experience in following the Basic Assessment and Environmental Impact procedure, as well as in preparing Environmental Management Plans, consulting with authorities and conducting Audits.

Expertise gained in a variety of environmental issues relating to municipal planning, mixed use development, agro-industrial developments, business parks, petrol filling stations, the housing sector, and infrastructural projects.

Projects Experience (by Sector)

ENVIRONMENTAL PLANNING /STRATEGIC PROJECTS

- Appointed by the Cato Ridge Logistical Hub Consortium (Pty) Ltd for the Cato Ridge Pilot Intermodal Project in Cato Ridge, KwaZulu-Natal (planning, BA/EIA and WULA).
- Appointed by Royal Shaka Estate (Pty) Ltd to project manage and obtain the necessary town planning and environmental rights the proposed 2155ha Royal Shaka Estate, North Coast.
- Port of Richards Bay – Strategic Environmental Assessment for Transnet National Ports Authority, (Aug 2018 – May 2019).
- Appointed by SMEC, on behalf of KZN COGTA, to undertake a High-level Environmental Status Quo & Recommendations Report for the Strategic Corridor Plan – Strategic Infrastructure Projects 2: Durban – Free State – Gauteng Development Region (June 2014 – present).
- Appointed by Finningley to assist with finalising the EIA and post authorisation work (including bulk servicing to the site on a mixed-use development) which included provision for an Autobody Supply Park.
- Advised Toyota SA on the EIA requirement for a proposed site for a Toyota Autobody
- Preparation of a Strategic Environmental Assessment (SEA) for the Airports Company South Africa (ACSA) for a portion of property known as the Eastern Precinct.
- Appointed by ACSA to undertake an EIA for a portion of property known as the Eastern Precinct to house an automotive park.
- Appointed by Crookes Brothers Limited to prepare an EMF and subsequently an EIA for two properties comprising 1800ha in extent.
- Appointed by the KwaDukuza Municipality to undertake an SEA for KwaDukuza.
- Appointed by the uThungulu District Municipality to prepare an Integrated Environmental Management Plan (IEMP) for the district

Pre-feasibility Studies/Screening

- Appointed by Process Projects to undertake an environmental screening of Site Selection for Lithium-ION NMC Precursor Materials Production (IDC project).
- Edgewood New Teaching and Learning Building. University of KwaZulu Natal. Desktop Environmental Screening Assessment and Mapping.
- Izotsha Hub Development, Izotsha. LDM. Desktop Environmental Prefeasibility Assessment and Mapping.
- Cato Ridge Development Project. SMEC. Desktop Biophysical Prefeasibility Assessment.
- Hammarsdale Link Road Project. SMEC. Desktop Environmental Screening Assessment.
- Msinga Cwaka New Town Centre – Appointed by LDM Consulting to undertake an Environmental Pre-feasibility Study for the Cwaka New Town Centre in Msinga Municipality, KwaZulu-Natal (Dec 2014).
- Avondale Forest Estate – Appointed by Trencon to undertake an Environmental Pre-feasibility Study for the Residential Eco-Estate adjacent Zimbali in Ballito, KwaZulu-Natal (Sep 2014).

CURRICULUM VITAE

Michelle Nevette

Climate Change

- Durban Climate Change Strategy – Appointed by eThekweni Municipality Environmental Planning and Climate Protection Department to establish a city status quo and recommendations to facilitate the implementation of climate change work within the city (May – Sep 2018).

Natural Resource Management (Environmental Rehabilitation)

- Renishaw Estate – Appointed by the Department of Environmental Affairs: Natural Resource Management Directorate to undertake the rehabilitation of the 1,833ha Mpambanyoni Conservation Development and Renishaw Estate (a mixed-use estate development with a strong conservation ethic) near Scottburgh, South Coast, KwaZulu-Natal (Dec 2017 – present).

POLICY & LEGISLATION

Review of Section 22 ECA Applications

- Appointed by DEAT to review and assess the pending Environmental Impact Assessment Applications for KZN submitted in terms of Section 22 of Environmental Conservation Act, Act 73 OF 1989.

Alien Vegetation

- Appointed to develop an auditing framework and to audit the eThekweni Municipality Production and Display Nurseries to determine their compliance with the Conservation of Agriculture Resources Act, 1983 (ACT No. 43 OF 1983) (CARA)

Coastal Zone Management

- Environmental Impact of the Alleged Illegal Cottages along the Wild Coast (former Transkei)

Telecommunication Policy for Urban Areas in KwaZulu-Natal

- Prepared on behalf of the Town and Regional Planning Commission. This policy involved extensive stakeholder consultation and included extensive research on the impact of telecommunication towers and associated infrastructure in urban areas. Assisted in the collection and preparation of data.

Training

- Appointed by uThungulu District Municipality to prepare training manuals and operational procedures manuals on EIA's which provided guidelines and principles for the District and Local Municipalities.

Advisory Services

- Appointed by Oxygen to provide environmental advisory services and assistance to municipal projects that have become 'stuck' on behalf of KZN PROV TREASURY for MUNICIPAL INFRASTRUCTURE

BUSINESS/INDUSTRY PROJECTS

- Audit of AMR to review their waste management practice and EMPr on behalf of Hillside Aluminium South 32
- ISO14001:2015 Internal Audit of Hillside Aluminium South 32
- ISO14001: 2015 Compilation of Legal Compliance Register and Aspects and Impacts Register for Technipaint (Pty) Ltd
- Appointed by Richards Bay Minerals (RBM) to conduct a performance assessment of RBM's approved EMPr and compile a legal liability report
- Permit/license external compliance audit for Bayside Aluminium
- Permit/license external compliance audit for Hillside Aluminium
- Permit/license external compliance audit for Metalloys Manganese Smelter in Meyerton

CURRICULUM VITAE

Michelle Nevette

Ports/Marine Infrastructure:

- Basic Assessment Report and EMP for the construction of marine infrastructure required for a floating dry dock in the Port of Richards Bay (Operation Phakisa)
- Preparation of a Sustainability Report and Environmental/Community Interface Report for new CO1 Conveyor for Transet Capital Project as FEL3 phase of Project Life Cycle process.

Petrol Filling Stations:

- Appointed by Engen Petroleum Limited to undertake BAs for the following Service Stations: Engen Ottawa, Engen Tongaat and Engen Galleira
- Appointed by Engen Petroleum Limited to undertake EIAs for the following Service Stations: Engen Umhlali; Engen Riverhorse 1; Engen Riverhorse 2; Engen CBD Downs and Engen Stapleton,;
- Appointed by Shell SA Marketing (PTY) Ltd to undertake EIAs for a petrol filling station, convenience stores and ATM at Mkuze, Phoenix and Hans Dettman.
- Appointed by Shell SA Marketing (Pty) Ltd to undertake the scoping process for a petrol filling station, convenience stores and ATM at Chatsworth, Marionhill, Verulam, Hannaford, Northcroft, Eastbury and Brookdale within Durban.
- Appointed by Shell SA Marketing (Pty) Ltd to undertake application for Exemptions for the upgrade of existing petrol filling stations at Bayhead and Gateway, Durban.
- Appointed by Caltex Oil South Africa (Pty) Ltd to prepare a Scoping Report and EMP for a petrol filling station, convenience stores and ATM at Brackenham, Richards Bay
- Preparation of Scoping Report and EMP for Philani Valley Petrol Station and Commercial Centre
- Preparation of Scoping Report and EMP for Umlazi Valley Petrol Station and Commercial Centre

Crude storage:

- Preparation for the Airports Company South Africa (ACSA) of an EIA for a proposed subdivision and rezoning of a portion of their property for future use by NATCOS (crude storage facility).

Mixed use/Business Park/Logistics/Shopping Centre:

- Appointed by the Cato Ridge Logistisc Hub Consortium (Pty) Ltd for the Cato Ridge Pilot Intermodal Project in Cato Ridge, KwaZulu-Natal (planning, BA/EIA and WULA).
- Preparation of an EIA for a mixed use development at Renishaw
- Appointed by Finningley to assist with finalising the EIA and post authorisation work (including bulks servicing to the site on a mixed use development) which included provision for an autosupply park.
- Advised Toyota SA on the EIA requirement for a proposed site for a Toyota Autobody
- Appointed by Barkomotive (Pty) Ltd, a wholly-owned subsidiary of Ellingham Estate (Pty) Ltd, to undertake an EIA Report for the proposed mixed-use Rorqual Estate Development near Park Rynie, South Coast, KwaZulu-Natal (October 2012).
- Appointed by the Passenger Rail Association of South Africa for the construction of an Intersite. Precinct in Scottburgh, located on the KwaZulu-Natal South Coast.
- Preparation of Duty of Care, Basic Assessment and EMP for Shoprite Distribution Center in Canelands.
- Preparation of a Basic Assessment for Sakhisizwe Holdings (Pty) Ltd for the proposed Warwick Mall as part of the 2010 World Cup Initiatives.
- Preparation of a Basic Assessment Prime Spot Trading 9 (Pty) Limited for the proposed Sithole Mall Shopping Centre in Osizweni
- Basic Assessment Report for a warehouse in Alton, Richards Bay, Briardale Trading
- Basic Assessment Report and EMP for a convenience centre in Gingindlovu
- Basic Assessment Report for the Amangwane Shopping Centre in Ulundi
- Preparation of an EIA for the Airports Company South Africa (ACSA) for a proposed Business Park on a portion of property known as the Eastern Precinct to house an automotive park.
- Preparation of an application for exemption for the Airports Company South Africa (ACSA) to lease a portion of their property to Shoprite-Checkers

CURRICULUM VITAE

Michelle Nevette

Waste License Applications

- Appointed by Richards Bay Minerals to undertake the waste license application for the salvage yard and ZN4.
- Appointed by Richards Bay Coal Terminal to undertake the waste license application for their existing operations.

COMMUNITY UPLIFTMENT PROJECTS

- Appointed by Renishaw Property Development (Pty) Ltd for the construction of a school containing sporting facilities, parking areas and engineering services in Scottburgh.
- Appointed by Industrial Development Corporation (IDC) to undertake an EIA Report for the proposed Nonoti Beach Tourism Development near Blythedale, North Coast, KwaZulu-Nata
- Basic Assessment Report and EMP for the uMhlathuze Multi-Purpose Sport Stadium in Richards Bay, uThungulu District Municipality
- Appointed by the Department of Works to prepare a Scoping Report and EMP for the rezoning of an “open space” area in Port Shepstone to “public administration”
- Appointed by the Department of Works to prepare an Application for Exemption for a police station and community hall in Khenani, Richards Bay.

RESIDENTIAL PROJECTS

Low-Cost Housing

- Greater Amaoti Housing Project – Appointed by the Department of Human Settlements to undertake the EIA process for the development of 20 000 housing units in Amaoti. eThekweni Municipality.
- Shayamoya Phase 3 Housing Development – Appointed by the Greater Kokstad Local Municipality to undertake the EIA process for the housing development.
- Appointed by Oxygen Infrastructure Solutions for development of the Marianridge Housing Development in Marianridge, KwaZulu-Natal.
- Appointed by eThekweni to undertake an EIA for Madimeni, Lower Langefontein and Molweni Low Cost Housing.
- Appointed by eThekweni to undertake an EIA for Trenance Park 2B and Redcliffe Low Cost Housing
- Appointed by eThekweni to undertake a Basic Assessment for Philani Valley Phase 17-25 Low Cost Housing
- Appointed by the Ethekeeni Housing Department to prepare Environmental Scoping Reports, EMPs and to undertake auditing for the following low cost housing projects:
 - Africa, Inanda
 - Stop 8/Nambia, Emtshabeni
 - Kwamashu Newland
 - Mshayazafe
 - Kwadabeka C
 - Verulam: Trenance Park 2B and Redcliffe
 - Lamontville North West
- Appointed to undertake an Environmental Considerations report for Vulemehlo Low cost Housing

Medium – High Income Housing:

- Appointed by Canboria Developments to prepare a Scoping Report for the proposed medium income housing project at Broadlands.
- Appointed by Midnight Storm Investors to prepare an Environmental Considerations Report for the development of a new multi-storey residential development on Lots 739 – 744, Tongaat.
- Appointed by Midnight Storm Investors to prepare an EMP and undertake auditing for Simbhiti Eco-Estate

CURRICULUM VITAE

Michelle Nevette

LINEAR DEVELOPMENT / INFRASTRUCTURE PROJECTS

- Project management and preparation of a range of Environmental Applications for the uMhlathuze Municipality Engineering Department for the financial year 2003/2004: This included environmental applications and auditing for road, water, canal, subdivisions and informal trading facilities projects.

Water Supply Schemes:

- Northern Aqueduct Augmentation Pipeline: Appointed by Aurecon Consulting Engineers for the construction of a pipeline from Ntuzuma to Ogunjini.
- Appointed by VGC to provide environmental services (environmental application, EMP and auditing) for a range of water supply projects, e.g. Mhlana, Madlebe, Khoza Water Supply Projects.
- Witz Road Water Reticulation for Ethekwini Municipality – Basic Assessment and monthly auditing for a 6500m of 160mm diameter pipeline.
- Appointed by uThungulu to undertake a scoping process for Middeldrift water supply
- Mtamvuna River Irrigation Potential Investigation, Izingolweni Sub-region, KwaZulu-Natal.

Roads and Bridges:

- Basic Assessment & EMPr for the upgrade of the Theunissen Road, Stanger
- Basic Assessment & EMPr for the proposed construction of a pedestrian bridge in Burbreeze, Tongaat
- Basic Assessment & EMPr for the proposed construction of a pedestrian bridge in Emansomini, Umlazi
- Integrated Rapid Public Transport Network (IRPTN) – Appointed by the Ethekwini Transport Authority, responsible for the planning, implementation and operations of public transport in the City, to undertake an EIA report for the IRPTN Corridor 1, Bridge City to Durban CBD, and Corridor 9, Bridge City to Umhlanga
- Integrated Rapid Public Transport Network (IRPTN) – Appointed by the Ethekwini Transport Authority, responsible for the planning, implementation and operations of public transport in the City, to undertake a BA report for the IRPTN Corridor 3, Bridge City to Pinetown.
- Appointed by eThekweni to undertake a Basic Assessment for the proposed Warwick Flyover (inbound and outbound) in Warwick Precinct as part of the 2010 World Cup Initiative.
- Appointed by eThekweni to undertake a Basic Assessment for the proposed Inwabi Road I Umlazi.
- Appointed by Umhlathuze Municipality to undertake an application for Exemption for the upgrade of a 1,5km gravel road (including a proper river crossing) within the existing alignment of the road in Ngwelezane.
- Appointed to undertake an application for Exemption for the Greytown Road Upgrade, KwaZulu-Natal
- Appointed to undertake a scoping process (including EMP) for the upgrading of Broadway, Durban North on behalf of the eThekweni Municipality Appointed to undertake an application for Exemption, EMP and auditing for the upgrading of the Wick/Todd Street in Verulam

Electricity/ Power lines

- Appointed by appointed by TRANS-AFRICA PROJECTS to manage the environmental process for the proposed Spoornet Coalink Upgrade Project. The project consists of the upgrade of existing infrastructure and three new transmission sub-stations, in order to increase the supply of electricity for new locomotives that Spoornet have ordered to add to the export capacity of coal. The proposed project crosses provincial borders starting in Empangeni (Natal) and extends across Newcastle to Ermelo (Mpumalanga)
- Appointed by uMhlathuze Municipality to undertake an EIA for the proposed Cygnus Electricity Substation project.
- Appointed by Eskom to undertake the scoping process (including the preparation of an EMP) for a substation and associated powerlines in Mtunzini
- Electricity Supply through Mhlanga Forest Estate Development EMP, KwaZulu-Natal, South Africa

CURRICULUM VITAE

Michelle Nevette

Renewable energy projects

- Juwi, EIA for the proposed development of 2x75MW Mayogi Solar Photovoltaic (PV) Plant, 132kV Power line and associated infrastructure near Kirkwood, Eastern Cape
- Bonsmara BAR and EIA for proposed development of a Solar PV Facility and associated infrastructure in the Moqhaka Local Municipality and the Fezile Dabi District, in the Free State Province.
- Upgrade Energy, Basic Assessment (BA) for the Proposed Development of the 200MW Lionthorn Solar Photovoltaic (PV) Plant, 132kV Power line and associated infrastructure near Leeudoringstad in the North West Province, Maquassi Hills Local Municipality, Dr Kenneth Kaunda District Municipality, 2021
- Upgrade Energy, Standard application for the Proposed Development of the 132kV Power line and associated infrastructure near Leeudoringstad in the North West Province, Maquassi Hills Local Municipality, Dr Kenneth Kaunda District Municipality, 2021
- Upgrade Energy, Basic Assessment (BA) for the Proposed Development of the 15MW Leeumax Solar Photovoltaic (PV) Plant, 132kV Power line and associated infrastructure near Leeudoringstad in the North West Province, Maquassi Hills Local Municipality, Dr Kenneth Kaunda District Municipality, 2021
- Upgrade Energy, Basic Assessment (BA) for the Proposed Development of the 9.9MW Wildebeestkuil 1 and 2 Solar Photovoltaic (PV) Plant, 132kV Power line and associated infrastructure near Leeudoringstad in the North West Province, Maquassi Hills Local Municipality, Dr Kenneth Kaunda District Municipality, 2021
- Upgrade Energy, Basic Assessment (BA) for the Proposed Development of the 9.9MW Leeuwbosch 1 and 2 Solar Photovoltaic (PV) Plant and associated infrastructure near Leeudoringstad in the North West Province, Maquassi Hills Local Municipality Dr Kenneth Kaunda District Municipality, 2021
- Upgrade Energy, Basic Assessment (BA) for the Proposed Development of the 132/11kV Leeudoringstad Solar Plant Substation near Leeudoringstad in the North West Province, Maquassi Hills Local Municipality in the Dr Kenneth Kaunda District Municipality, 2021
- Koup 1 and 2 Wind Energy Facilities and associated infrastructure – Appointed by Genesis EcoEnergy (Pty) Ltd to undertake the BA processes for the renewable wind energy facilities associated infrastructure.
- Beaufort West Wind Energy Facilities and associated infrastructure – Appointed by South Africa Mainstream Renewable Power Developments to undertake BA processes for the renewable wind energy facilities associated infrastructure.
- Ceres Wind Energy Facilities and associated infrastructure – Appointed by South Africa Mainstream Renewable Power Developments to undertake BA processes for the renewable wind energy facilities and associated infrastructure.
- Skilpad 1, 2 and 3 Solar PV Energy Facilities – Appointed by ABO Wind Renewable Energies (Pty) Ltd to undertake the BA processes for three Solar PV Facilities.
- EA Amendment Processes for six (6) renewable energy facilities in the Northern Cape – Appointed by South Africa Mainstream Renewable Power Developments.

Pipelines

- Sezela Marine Outfall Pipeline, Scoping Report & Environmental Management Plan, KZN
- Petronet Re-Routing of existing DJP Pipeline around Pietermaritzburg EIA Scoping Report & Environmental Management Plan, KwaZulu-Natal

Cemeteries

- Basic Assessment & EMPr for the proposed Dannhauser Cemetery, Dannhauser

WATER USE LICENSES

- Cato Ridge Pilot Intermodal Project in Cato Ridge (Zone 1), KwaZulu-Natal. Appointed by the Cato Ridge Logistics Hub Consortium (Pty) Ltd. Compilation and Submission of Water Use License.
- Mandela Crossroads Water Use License. Ethekwini Municipality. Compilation and Submission of Water Use license.
- Bridge City Depot Water Use License. Ethekwini Municipality. Compilation and Submission of Water Use license.
- Zamani 1B Phase B1 and B2 Water use License. Ethekwini Municipality. Compilation and Submission of Water Use license.

CURRICULUM VITAE

Michelle Nevette

AMENDMENT APPLICATIONS

- Amendment of the Renishaw Mixed Use Development Environmental Authorisation, Phase 3
- Amendment of the environmental authorisation for the Engen Galleria Petrol Filling Station
- Malandela Crossroads Development – Appointed by eThekweni Municipality to amend the Environmental Authorisation to include an amended layout.
- Northern Aqueduct Augmentation Pipeline – Appointed by Aurecon Consulting Engineers to amend the Environmental Authorisation for changes in the pipeline alignment from Ntuzuma to Ogunjini.
- Bridge City Depot – Appointed by the eThekweni Municipality to amend the Environmental Authorisation to extend the footprint of the development and apply for construction within wetland buffers.
- Zamani Low Cost Housing Development – Appointed by the eThekweni Municipality Housing Department to amend/extend the validity of the Environmental Authorisation
- Malandela Crossroads Development – Appointed by eThekweni Municipality to amend the Environmental Authorisation to exclude certain parties from a condition of the EA.
- Integrated Rapid Public Transport Network (IRPTN) C3B – Appointed by eThekweni Transport Authority to amend the Environmental Authorisation to include a deviation in the transport route as well as to add an additional depot site to the authorisation.

Courses Attended

- 2021: Project Management Course
- 2018: ISO 14001:2015 Introduction and Implementation of an EMS
- 2018: Risk ZA
- 2017: Amendments to the EIA Regulations
- 2017: NEC 3 Course

CURRICULUM VITAE

Michelle Guy

Name Michelle Guy (née Evans)

Profession Environmental Scientist

Name of Firm SiVEST SA (Pty) Ltd

Present Appointment Environmental Scientist:
Environmental Division

Years with Firm 10 years

Date of Birth 30 September 1986

Nationality South African



Education

- Scottburgh High School
- Rhodes University (2006-2011)

Professional Qualifications

- Bachelor of Arts - Rhodes University, Grahamstown (2009)
- BSc Environmental Science (Hons) – Rhodes University, Grahamstown (2010)
- Master of Science in Environmental Science – Rhodes University, Grahamstown (2010-2011)
- Registered Professional Natural Scientist (SACNASP) Pr.Sci.Nat. Registration No. 126338 (2020)
- Registered Environmental Impact Assessment Practitioner (EAPASA). Reg No. 2019/868

Membership to Professional Societies

- International Association for Impact Assessment South Africa (IAIAsa)
- South African Council for Natural Scientific Professions (SACNASP) Pr. Sci.Nat. Reg No. 126338
- Environmental Assessment Practitioners Association of South Africa (EAPASA). Reg No. 2019/868
- South African Wind Energy Association (SAWEA)

Employment Record

Aug 2012- present SiVEST SA (Pty) Ltd – Environmental Division: Environmental Scientist
2010 Graduate assistant in the Environmental Science Department of Rhodes University

2009 Graduate assistant in the Environmental Science Department of Rhodes University

Language Proficiency

LANGUAGE	SPEAK	READ	WRITE
English	Fluent	Fluent	Fluent
Afrikaans	Fair	Fair	Fair

Years of Working Experience: 10 YEARS

Countries of Work Experience

- South Africa

Fields of Specialisation

- Project Management
- Environmental Impact Assessments
- Environmental Compliance Monitoring
- Water Use Licence Applications
- GIS analysis (ARCGIS)

Overview

Michelle has been with SiVEST Environmental Division since August 2012 and is an experienced Environmental Scientist. Michelle has completed her Master of Science degree in Environmental Science (with distinction). She has also completed a Bachelor of Science honours degree in Environmental Science and Geography. She is a registered Professional Natural Scientist (SACNASP) and a registered Environmental Assessment Practitioner (EAPASA). Michelle has extensive experience in the compilation of environmental impact assessments, water use licensing, prefeasibility assessments, environmental management programmes, environmental auditing as well as GIS Mapping.

Key Projects Experience

ENVIRONMENTAL CONSULTING (August 2012 – present)

Environmental Impact Assessment Reports

- Wirtz Road Water Reticulation for Ethekwini Municipality – Basic Assessment and monthly auditing for a 6500m of 160mm diameter pipeline.
- Mixed-use Residential Estate Development – Appointed by Barkomotive (Pty) Ltd, a wholly-owned subsidiary of Ellingham Estate (Pty) Ltd, to undertake an EIA Report for the proposed mixed-use Rorqual Estate Development near Park Rynie, South Coast, KwaZulu-Natal (October 2012).
- Integrated Rapid Public Transport Network (IRPTN) – Appointed by the Ethekwini Transport Authority, responsible for the planning, implementation and operations of public transport in the City, to undertake an EIA report for the IRPTN Corridor 1, Bridge City to Durban CBD, and Corridor 9, Bridge City to Umhlanga.
- Shayamoya Phase 3 Housing Development – Appointed by the Greater Kokstad Local Municipality to undertake the EIA process for the housing development.
- Greater Amaoti Housing Project – Appointed by the Department of Human Settlements to undertake the EIA process for the development of 20 000 housing units in Amaoti. eThekweni Municipality.
- Koup 1 and 2 Wind Energy Facilities – Appointed by Genesis Eco-Energy (Pty) Ltd to undertake the EIA processes for the renewable wind energy facilities.
- Beaufort West Wind Energy Facilities – Appointed by South Africa Mainstream Renewable Power Developments to undertake EIA processes for the renewable wind energy facilities.
- Pofadder 1, 2 and 3 Wind Energy Facilities – Appointed by Atlantic Energy Partners to undertake EIA processes for renewable wind energy facilities.
- Bonsmara Solar Energy Facility – Appointed by WKN Windcurrent to undertake the EIA processes for renewable energy facilities.
- Lesaka Solar Energy Facilities – Appointed by Enertrag South Africa to undertake the EIA processes for renewable energy facilities.
- Camden Wind Energy Facility - Appointed by EDF Renewables to undertake the EIA process for renewable energy facilities.

Basic Assessment Reports

- Integrated Rapid Public Transport Network (IRPTN) – Appointed by the Ethekwini Transport Authority, responsible for the planning, implementation and operations of public transport in the City, to undertake a BA report for the IRPTN Corridor 3, Bridge City to Pinetown.
- Low-cost housing project (Assessment Centre Housing Project) – Appointed by the Woodglaze Trading (Pty) Ltd, to provide additional housing in the Phoenix area.

CURRICULUM VITAE

Michelle Guy

- Intersite Precinct Development – Appointed by the Passenger Rail Association of South Africa for the construction of an Intersite Precinct in Scottburgh, located on the KwaZulu-Natal South Coast.
- Petrol Filling Station – Appointed by Cadismart (Pty) Ltd to for the construction of a petrol filling station, convenience store, dealership show room and farm stall situated on The Farm Grantham no 17754 in Felixton.
- School – Appointed by Renishaw Property Development (Pty) Ltd for the construction of a school containing sporting facilities, parking areas and engineering services in Scottburgh.
- Housing Development – Marianridge Housing Development – Appointed by Oxygen Infrastructure Solutions for development of the Marianridge Housing Development in Marianridge, KwaZulu-Natal.
- Logistics – Appointed by the Cato Ridge Logistics Hub Consortium (Pty) Ltd for the Cato Ridge Pilot Intermodal Project in Cato Ridge, KwaZulu-Natal.
- Pipeline - Northern Aqueduct Augmentation Pipeline – Appointed by Aurecon Consulting Engineers for the construction of a pipeline from Ntuzuma to Ogunjini.
- Renewable Energy Facilities to include Battery Energy Storage Systems (BESS) – Appointed by South Africa Mainstream Renewable Power Developments.
- Koup 1 and 2 Wind Energy Facilities and associated infrastructure – Appointed by Genesis Eco-Energy (Pty) Ltd to undertake the BA processes for the renewable wind energy facilities associated infrastructure.
- Beaufort West Wind Energy Facilities and associated infrastructure – Appointed by South Africa Mainstream Renewable Power Developments to undertake BA processes for the renewable wind energy facilities associated infrastructure.
- Ceres Wind Energy Facilities and associated infrastructure – Appointed by South Africa Mainstream Renewable Power Developments to undertake BA processes for the renewable wind energy facilities and associated infrastructure.
- Pofadder 1, 2 and 3 Wind Energy Facilities – Appointed by Atlantic Energy Partners to undertake BA processes for renewable wind energy facilities grid infrastructure.
- Bonsmara Solar Energy Facility – Appointed by WKN Windcurrent to undertake the BA process for renewable energy facilities grid infrastructure.
- Lesaka Solar Energy Facilities – Appointed by Enertrag South Africa to undertake the BA processes for renewable energy facilities grid infrastructure.
- Serval Solar Energy Facilities – Appointed by ABO Wind renewable energies (Pty) Ltd Africa to undertake the BA processes for renewable energy facilities.

Amendment Applications

- Integrated Rapid Public Transport Network (IRPTN) C3B – Appointed by eThekweni Transport Authority to amend the Environmental Authorisation to include a deviation in the transport route as well as to add an additional depot site to the authorisation.
- Mandela Crossroads Development – Appointed by eThekweni Municipality to amend the Environmental Authorisation to exclude certain parties from a condition of the EA.
- Zamani Low Cost Housing Development – Appointed by the eThekweni Municipality Housing Department to amend/extend the validity of the Environmental Authorisation.
- Bridge City Depot – Appointed by the eThekweni Municipality to amend the Environmental Authorisation to extend the footprint of the development and apply for construction within wetland buffers.
- Kindlewood Housing Expansion – Appointed Tongaat Hulett to amend the Environmental Authorisation to include additional residential units.
- Northern Aqueduct Augmentation Pipeline – Appointed by Aurecon Consulting Engineers to amend the Environmental Authorisation for changes in the pipeline alignment from Ntuzuma to Ogunjini.
- Mandela Crossroads Development – Appointed by eThekweni Municipality to amend the Environmental Authorisation to include an amended layout.
- EA Amendment Processes for six (6) renewable energy facilities in the Northern Cape – Appointed by South Africa Mainstream Renewable Power Developments.

CURRICULUM VITAE

Michelle Guy

Environmental Auditing

- Rocky Park Integrated Residential Development – Appointed by KwaDukuza Municipality to undertake an environmental audit of the Rocky Integrated Residential Development currently under development in Stanger, KwaZulu-Natal (August 2012).
- Mount Edgecombe (Camden 2) Residential Development – Appointed by Rocro Property Development (Pty) Ltd to undertake an environmental audit of Camden 2 Residential Development currently under development in Mount Edgecombe Golf Estates, Mount Edgecombe, KwaZulu-Natal (August 2012).
- Trenance Park Low-Cost Housing – Appointed by eThekweni Municipality Housing Department to undertake an environmental audit of the Trenance Park Housing Project in Verulam, KwaZulu-Natal (August 2012).
- Vulamehlo Rural Housing Development – Appointed by the Vulamehlo Municipality to undertake an environmental audit of the Vulamehlo Rural Housing Development in Kenterton, KwaZulu-Natal (January 2013).
- Witz Road Water Reticulation for Ethekeeni Municipality – Appointed by the Ethekeeni Water and Sanitation Department to undertake the auditing of the sewer reticulation installation.
- Integrated Rapid Public Transport Network (IRPTN) – Appointed by MCA Joint Venture, to undertake an environmental audit for the implementation and operations of the IRPTN Corridor 3, Bridge City to Pinetown (June 2014-December 2018).
- Zamani 1B Phase B1 and B2 Low-Cost Housing Project – Appointed by Shula Construction to undertake an environmental audit of the Zamani Low-Cost Housing Development in Inanda, KwaZulu-Natal (June 2017).
- Malandela Crossroads Redevelopment Project – Appointed by Ethekeeni Municipality to undertake the environmental auditing for the implementation of a taxi rank and associated infrastructure in KwaMashu (January 2018-April 2018).
- Umhlanga Town Lodge – Appointed by City Lodge Hotel Group to undertake the environmental auditing for the implantation of a new Town Lodge Hotel in Umhlanga (January 2018 - present).
- DTPC Support Zone (Double Basement Construction) – Appointed by Dube Tradeport to undertaken the environmental auditing for the construction of the double basement in La Mercy (June 2019 – present)

Pre-feasibility Assessments and GIS

- Florence Nightingale Drive Precinct Plan, Chatsworth KwaZulu Natal. Ethekeeni Municipality. Preliminary Environmental Investigation and Mapping.
- Proposed Forest Estate Development in Ballito, South Coast. Trencon Projects. Environmental Prefeasibility Investigation and Mapping.
- Cato Ridge Development Project. SMEC South Africa. Desktop Biophysical Prefeasibility Assessment and Mapping.
- Hammarisdale Link Road Project. SMEC South Africa. Desktop Environmental Screening Assessment and Mapping.
- Edgewood New Teaching and Learning Building. University of KwaZulu Natal. Desktop Environmental Screening Assessment and Mapping.
- Izotsha Hub Development, Izotsha. LDM. Desktop Environmental Prefeasibility Assessment and Mapping.
- Maryvale, Westville Prefeasibility. SLB Consulting. Desktop Environmental Prefeasibility Assessment and Mapping.
- Percy Osborne Road Prefeasibility. SLB Consulting. Desktop Environmental Prefeasibility Assessment and Mapping.
- Mayors Walk Road Upgrade Prefeasibility. SMEC. Desktop Environmental Prefeasibility Assessment and Mapping.
- UKZN High Level Assessment (Westville, Edgewood, Pietermaritzburg, Howard College). LDM. Desktop Environmental Prefeasibility Assessment and Mapping.
- Gledhow Compound Housing Development. Ngeja Consulting Engineers. Environmental Screening Assessment and Mapping.
- Marianridge Housing Development – Appointed by Oxygen Infrastructure Solutions to undertake the Departmental Enquiries, High Level Screening and Mapping for the Marianridge Housing Development in Marianridge.
- Reddam House – Prefeasibility and GIS Mapping for Reddam House School in Umhlanga.

CURRICULUM VITAE

Michelle Guy

Wetland Assessments

- Proposed construction of the Integrated Rapid Public Transport Network (IRPTN) from Durban CBD to KwaMashu and from Kwa-Mashu to Umhlanga. Ethekewini Transport Authority. Wetland Delineation and Impact Assessment.
- Bridge City Depot in KwaMashu. Ethekewini Transport Authority. Wetland Delineation Report.
- Amanzimtoti River Trunk Sewer Project, KwaZulu Natal. Environmental Planning and Design CC. Surface Water Delineation, Functional Impact Assessment and Rehabilitation and Monitoring Report.
- Ntuzuma Sewer Alignment Project, KwaZulu Natal Province. Environmental Planning and Design CC. Wetland Delineation, Functional and Impact Assessment, Rehabilitation and Monitoring Plan.
- Proposed Kanku Road Housing Development. Map Africa Consulting Engineers. Wetland Delineation, Health and Functional Assessment.

Wetland Rehabilitation Plan

- Izindophe Wetland, Eshowe. Tongaat Hulett Sugar South Africa. Soil and Wetland Rehabilitation Plan.
- John Ross Highway Petrol Filling Station. Union Square Properties. Wetland Rehabilitation Plan and Alien Invasive Plant Removal Programme.

Water Use Licenses

- Malandela Crossroads Water Use License. Ethekewini Municipality. Compilation and Submission of Water Use license.
- Bridge City Depot Water Use License. Ethekewini Municipality. Compilation and Submission of Water Use license.
- Zamani 1B Phase B1 Water use License. Ethekewini Municipality. Compilation and Submission of Water Use license.
- Zamani 1B Phase B2 Water use License. Ethekewini Municipality. Compilation and Submission of Water Use license.
- Cato Ridge Pilot Intermodal Project in Cato Ridge (Zone 1), KwaZulu-Natal. Appointed by the Cato Ridge Logistics Hub Consortium (Pty) Ltd. Compilation and Submission of Water Use License.
- Greater Amaoti Housing Project – Appointed by the Department of Human Settlements to undertake the WULA process for the development of 20 000 housing units in Amaoti. eThekewini Municipality.

Strategic Planning Projects

Provision of database, analysis and GIS mapping support for the following:

- Commissioned by CoGTA as an O&M support plan to the municipalities. Database management and mapping to verify the assets of 6 KZN municipalities
- Commissioned by Focus Project Management on behalf of the Department of Public Works, Province of KwaZulu-Natal as Project Managers for the Department of Education drought programme for mapping of borehole infrastructure at 870 schools in the North Coast region of KwaZulu-Natal.

Project and Research Experience

BACHELOR OF ARTS (BA)

Earth Science 101, Geography 102, 2 & 3, Anthropology 1 & 2, Zoology 101, Psychology 1, Cell Biology, History and Appreciation of Music, Environmental Science 2 & 3.

Research Project: Dams as Green Spaces: Environmental Implications of Recreational Activities in and around Grahamstown.

CURRICULUM VITAEMichelle Guy

Field Work: site inspections, the distribution of a questionnaire, aerial photograph analysis and an assessment of relative water quality constituents related to recreational use.

BACHELOR OF SCIENCE HONOURS DEGREE IN ENVIRONMENTAL SCIENCE (BSC HONS)

Environmental Impact Assessment, Statistics, Rehabilitation and Disturbance Ecology, Wetland Ecology, Strategic Conservation Assessment.

Research Project: Fluvial style of the Baviaans River

Field Work: Extensive surveying using dumpy level surveying techniques, particle size distribution.

MASTER OF SCIENCE BY THESIS IN ENVIRONMENTAL SCIENCE WITH DISTINCTION

Research Project: The LUNA (Livelihoods, Urbanization, Natural Resources in Africa) Project was started in 2009 as a partnership between five African and three German research institutions, funded by the Volkswagen Foundation. LUNA aims to analyze the impact of urbanization on the use of natural resources and livelihoods in five African countries, namely South Africa, Botswana, Tanzania, Cameroon and Cote d'Ivoire. In addition to examining the overall aims of the LUNA project, my masters project has an individual focus entitled "Livelihood and coping strategy changes along rural-urban continua, with an emphasis on natural resources".

Field Work: Administration of a standardized survey instrument to capture household details and livelihood activities.

As part of the LUNA project, Summer Schools were organized for 2010 and 2011 to encourage research partnerships, enhance skills training and monitor the overall progress of the project in each country. The Summer Schools were held in three different countries and the themes planned according to the host institution's strengths, with student planning and participation forming an intricate part of the process. International trips and conferences:

- Moshi (Tanzania) 24 May – 4 June 2010.
- Freiburg (Germany) 6 September – 19 September 2010.
- Gaborone (Botswana) 18 – 27 May 2011.

Bursaries and Publications

- Full bursary to study Master of Science degree. Volkswagen Germany ZAR 150 000

Publications and Conference PresentationsPopular Publications and Reports

Urbanisation and Natural Resource Use in Phalaborwa, South Africa.

Available: <http://gnetmail.co.za/members/link.php?M=7264235&N=4254&L=4191&F=H>

LUNA Summer Schools, The Spekboom, Rhodes University.

Available: http://www.ru.ac.za/static/departments/environsci/documents/newsletter/Issue_12.pdf



Appendix C:

Complaints Record Sheet

Complaints Record Sheet

COMPLAINTS RECORD SHEET	File Ref:	DATE:
	Page of
COMPLAINT RAISED BY:		
CAPACITY OF COMPLAINANT:		
COMPLAINT RECORDED BY:		
COMPLAINT:		
PROPOSED REMEDIAL ACTION:		
EO: _____ Date: _____		
NOTES BY ECO:		
EO: _____ Date: _____ Site Manager: _____ Date: _____		



Appendix D:

Summary of Specialist Findings and Recommendations

Specialist Study	Findings	Recommendations
Aquatic	<p>Only the episodic drainage lines and rivers with riparian vegetation can, from an ecological perspective, be classified as watercourses (freshwater ecosystems) due to the expression of a riparian response by vegetation and the presence of alluvial soil. Preferential flow paths (PFPs) are unlikely to have catchments which are large enough to generate a flood response and are not considered freshwater ecosystems from an ecological perspective. Episodic drainage lines without riparian vegetation may, on a system specific basis be considered freshwater ecosystems should they be subject to a 1:100 year floodline, as determined by a suitably qualified professional.</p> <p>PFPs and drainage lines, not defined as watercourses still function as waterways, through the episodic conveyance of water through the landscape. These systems are still considered important for the hydrological functioning of the larger episodic tributaries and rivers and must ideally be protected to manage the pattern, flow and timing of water in the landscape, implying that runoff from the project area must be carefully managed.</p> <p>The Impact Assessment identified that the Negative High and Medium Impacts in the construction, operation and decommissioning phases with mitigation can be lowered to a Negative Low Impact, on condition of strict adherence to general and project-specific suggested mitigation measures. Only the proposed access roads pose direct impacts to freshwater ecosystems, but the layout was proposed in a manner to, as far as possible, avoid and minimise</p>	<ul style="list-style-type: none"> • Two episodic rivers with riparian vegetation will be crossed by newly proposed access roads; therefore additional precautionary measures should be taken in terms of erosion and sediment control and dissipation; • All construction works for the freshwater ecosystem road crossings must be supervised by a freshwater ecologist that must ensure that weather conditions are sufficiently dry enough such that no diversion of flow is necessary to proceed with construction – this is imperative to maintain a low impact significance; • Construction activities in the freshwater ecosystem will potentially result in bank destabilisation, and cause bank incision and sedimentation of the freshwater ecosystem, therefore, sediment control devices should be installed downgradient of the construction site in the freshwater ecosystem and all excess sediment is to be removed once construction activities have been completed; • For the solar arrays near episodic drainage lines, a 25 m setback to be allowed to ensure sufficient space for erosion and sediment control and dissipation near these episodic features, as these areas are subjected to greater amounts of runoff compared to non-developed areas during high rainfall events; and • Existing roads and newly authorised freshwater ecosystem crossings should be utilised to gain access to the proposed construction area. No indiscriminate crossing of the freshwater ecosystems outside of the existing crossing points or driving in unmarked areas through the buffer zones of the freshwater ecosystems may be permitted; • Development footprint areas to remain as small as possible and vegetation clearing to be limited to what is essential;

Specialist Study	Findings	Recommendations
	<p>crossings. All other infrastructure falls outside of the 32 m NEMA Zone of Regulation (ZoR).</p>	<ul style="list-style-type: none"> • New road crossings must intersect the freshwater ecosystem at a right angle (perpendicular) to minimise disturbance to the freshwater ecosystem; • Soil excavated as part of trenching must be stockpiled immediately upstream of the trench and backfilled as soon as possible with the removed material and suitably compacted to avoid any erosion and preferential flow paths from forming; • During excavation activities, the topsoil and vegetation that is removed should be stockpiled separately from other material outside of the 32 m NEMA ZoR; and • After construction of the surface infrastructure, the area surrounding the surface infrastructure must be revegetated with suitable indigenous vegetation (terrestrial vegetation) to prevent the establishment of alien vegetation species and their potential spread into the freshwater ecosystems.
Hydrological	<p>The proposed solar project will alter the natural environmental state, thereby affecting the generation of storm water and the associated potential for erosion. Volumes of storm water generated over disturbed areas are generally expected to increase because of the reduction in natural vegetation or the addition of areas of hardstanding resulting from the combination of PV infrastructure and associated pylons, Battery Energy Storage System, the temporary laydown area, the construction area as well as internal access roads. The quality of the storm water generated is also expected to be affected by the removal of vegetation and the excavation of soils. The movement of vehicles over the site will also potentially introduce possible hydrocarbons.</p> <p>A conceptual storm water management plan has been</p>	<ul style="list-style-type: none"> • It is recommended that the site is regularly inspected, with areas prone to erosion identified. Silt fences may be suitable for the control of erosion from areas disturbed or affected during construction, operation or decommissioning. • It is recommended that the proposed storm water management plan is implemented. This will ensure the attenuation of storm water runoff. It is also recommended that berms, channels, and sediment traps associated with the drainage lines are designed appropriately (in accordance with the best practice guidelines). • Natural vegetation should be re-established to represent the previously undisturbed environment as closely as possible • It is recommended that the grass beneath the panels be well maintained or that a buffer

Specialist Study	Findings	Recommendations
	<p>developed for the site aimed at ensuring the impact of water generated upstream or on site during extreme rainfall events can be better managed by routing storm water away from infrastructure thereby reducing any associated flood risk.</p> <p>A hydrological impact assessment was undertaken to determine the significance of each identified potential impact. Potential impacts considered in this assessment for the construction and operational phases were changes in catchment water resources, changes in catchment water quality, and changes in flood hydrology. Potential significance for the considered impacts ranged from medium in the pre-mitigation scenarios to low in the post mitigation scenarios.</p>	
Terrestrial	<p>The study area is located within the Hantam Karoo vegetation type, listed as Least Threatened, and intersects a CBA1, CBA2 and ESA according to the Northern Cape CBA Map. The CBA1 are the NFEPA Rivers, Klein-Rooiberg and Rooiberg, both considered largely natural which must be excluded from development. CBA2 are mainly due to the FEPA catchment, FEPA rivers and associated 500m buffer and the vegetation type being located within the Succulent Karoo biome. The ESA towards the western section is the Krom River and associated wetlands, while the smaller scattered ESAs towards the eastern boundary are koppies which are large high value climate resilience areas. Linear infrastructure such as roads and internal powerlines can cross the watercourses, but care should be taken in the planning of this.</p>	<ul style="list-style-type: none"> • Rehabilitation and monitoring plan required post-construction and post-operational phase of the project which addresses ecosystem functioning, fire management, alien invasive species management and effective methods of rehabilitating natural vegetation to functional systems (not just biomass replacement). • Roads and underground cabling must avoid sensitive areas as far as possible by considering various layout alternatives. The karoo shrubland habitat will not be transformed completely (only PV related – this is not the case for roads and temporary laydown areas), accordingly with appropriate mitigation and rehabilitation measures post-construction and post-operational, the impact of the PV panels is considered medium for karoo shrubland. • It is advised that an ecological specialist is appointed during the construction, operational and decommissioning phases to monitor impacts and related

Specialist Study	Findings	Recommendations
	<p>The majority of the SEF consist of Karoo shrubland with grassland patches on flat plains and gently sloping hills that are not considered sensitive. The watercourses and pans are considered sensitive and should be avoided during the construction period for placement of infrastructure, laydown areas and associated infrastructure. Roads and cables will cross watercourses, and the impacts can be mitigated by reducing it to acceptable levels since avoidance is not possible. The Koppie towards the north-east must be avoided from all development activities.</p>	<p>mitigation measures regarding natural and sensitive habitats and the faunal and floral assemblages occurring there.</p> <ul style="list-style-type: none"> • Care should be taken not to unnecessarily clear or destroy natural vegetation. • Development and planned activities should therefore be planned in such a way that totally transformed areas are chosen for major developments and natural veld and especially any highly sensitive areas are avoided as far as possible. • Sensitive species 144 must be protected in situ and a 200m buffer is applicable where no construction activities may take place. • Provincially listed species which are affected by the proposed development requires a permit application for their removal from the provincial authority prior to the commencement of construction activities.
Agricultural	<p>The development will occupy land that is of very limited land capability, which is insufficient for crop production. There is not a scarcity of such agricultural land in South Africa and its conservation for agricultural production is not therefore a priority.</p> <p>The amount of agricultural land use by the development is within the allowable development limits prescribed by the agricultural protocol. These limits reflect the national need to conserve valuable agricultural land and therefore to steer, particularly renewable energy developments, onto land with low agricultural production potential.</p> <p>The PV panels will not necessarily totally exclude agricultural production. The area may still be used to graze sheep that will, in addition, be protected against stock theft within the security area of the facility.</p>	<p>From an agricultural impact point of view, it is recommended that the development be approved.</p> <p>The conclusion of this assessment on the acceptability of the proposed development and the recommendation for its approval is not subject to any conditions, other than recommended mitigation.</p>

Specialist Study	Findings	Recommendations
	<p>All renewable energy development in South Africa decreases the need for coal power and thereby contributes to reducing the large agricultural impact that open cast coal mining has on highly productive agricultural land throughout the coal mining areas of the country.</p>	
Avifaunal	<p>The study area is situated within the Hantam Karoo vegetation type. The study area is not anticipated to support breeding populations of several large terrestrial bird species such as cranes and large raptor species in sufficiently large densities or within breeding habitat that may be considered a fatal flaw. However, given the size of the area, the proximity to a very large areas of suitable habitat, the high-density presence of Red Lark, Ludwig's Bustard and Karoo Korhaan is deemed to be a significant concern. The CBAs of the Northern Cape designated that majority of the site falls within a CBA 1, CBA 2 and an ESA1. Avoidance mitigation could be applied wherever possible to project infrastructure design and limit the amount of habitat impacted.</p> <p>A total of twenty-two (22) priority species has the possibility of occurring within and around the study area.</p> <p>Some of the priority bird species are not habitat-bound to the area for nesting and/or foraging purposes and is therefore important to focus on the some of the most significant cumulative impacts for the proposed solar project.</p> <p>Overall and with these factors taken into consideration, the specialist deems that the project may proceed.</p>	<p>Formal post construction monitoring must be applied once the development has been activated, as per the most recent edition of the best practice guidelines (Jenkins et al. 2017). The exact scope and nature of the post-construction monitoring will be informed on an ongoing basis by the result of the monitoring through a process of an establishment of available new technology and adaptive management.</p>
Geotechnical	<p>The assessment area is underlain by rock units of Ecca Group of Karoo Supergroup and intrusive dolerite.</p>	<p>It is recommended that areas of steeper slope gradients and drainage channels are avoided when determining the final</p>

Specialist Study	Findings	Recommendations
	<p>Some geotechnical constraints have been identified, primarily shallow and outcropping bedrock which may cause excavation difficulties, localised steep slopes with thick talus and existing drainage channels with concentrated water flow. These conditions and associated constraints may be mitigated via standard engineering design and construction measures.</p> <p>The Lesaka 1 SEF area and substation areas may be divided into four (4No.) ZONES (I, II, III and IV) where similar geotechnical conditions are anticipated. ZONE I is defined by shallow occurring bedrock covered by thin, loose transported material and varying degrees of cemented calcrete. ZONE II can be characterised by talus deposits on relatively steep slopes that is linked to ZONE III that defines the high lying outcropping bedrock of which is seemingly dolerite material. ZONE IV is confined to low lying areas that are underlain by relatively thicker alluvial deposits, identifiable by erosion paths, rills, and continuous drainage features.</p> <p>No fatal flaws or 'no-go' areas have been identified that would render any assessment areas unsuitable from a geological and geotechnical perspective.</p> <p>No geologically or geotechnically sensitive areas were identified within or near the assessment area.</p>	<p>infrastructure layout. The proposed substation and BESS area falls within FACET I which is expected to provide good founding conditions and minimal earthworks before construction, therefore reducing the potential environmental impact.</p> <p>From a geotechnical and geological perspective, no fatal flaws or sensitivities have been identified within or close to the Lesaka 1 SEF assessment area and in the proposed substation, and BESS. It is therefore recommended that the proposed activity be authorised.</p>
Social	<p>The findings of the SIA indicate that the proposed Lesaka 1 PV SEF and associated infrastructure will result in several social and socio-economic benefits, including creation of employment and business opportunities during both the construction and operational phase.</p>	<ul style="list-style-type: none"> • Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase. • Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.

Specialist Study	Findings	Recommendations
	<p>The project will also contribute to local economic development through socio-economic development (SED) contributions. In addition, the development will improve energy security and reduce the carbon footprint associated with energy generation. The findings of the SIA also indicate that the potential negative impacts associated with both the construction and operational phase are likely to be Low Negative with mitigation. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented.</p> <p>The establishment of the proposed Lesaka 1 PV SEF is supported by the findings of the SIA.</p>	
Heritage	<p>The surveys conducted for impacts to heritage resources including archaeology and palaeontology proceeded with no significant constraints or limitations, and the project area was comprehensively surveyed for heritage resources. An area of higher archaeological sensitivity associated with the stream systems across the development area was identified and mapped. This area must be avoided in the final PV layout in order to ensure that no significant archaeological heritage resources are negatively impacted by the proposed development.</p> <p>Despite the high sensitivity for impacts to palaeontological heritage resources of sediments in the vicinity of the development, the areas proposed for the Lesaka 1 PV facility and its associated infrastructure consist of dolerite and quaternary sands and as such, the layout as proposed has low sensitivity for impacts to palaeontological sensitivity.</p>	<ul style="list-style-type: none"> • The area of high archaeological sensitivity identified is avoided in the final configuration of the PV layout. The final layout provided complies with this recommendation. • If Palaeontological Heritage is uncovered during surface clearing and excavations ECO should be informed immediately. Fossil discoveries ought to be protected and the ECO/site manager must report to South African Heritage Resources Agency (SAHRA) so that mitigation (recording and collection) can be carried out. • Although all possible care has been taken to identify sites of cultural importance during the investigation of the study area, it is always possible that hidden or subsurface sites could be overlooked during the assessment. 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, burials or other categories of heritage resources are found during the proposed development, work must cease in the

Specialist Study	Findings	Recommendations
		vicinity of the find and SAHRA must be alerted immediately to determine an appropriate way forward.
Transport	<p>This Transportation Study assessed the anticipated traffic impact of the Lesaka 1 Solar Energy Facility. It was found that the highest traffic impact of the proposed development would occur during the construction phases, which was estimated to generate an additional ± 14 peak hour vehicle trips. The existing site accesses are deemed sufficient for the proposed facility but may require some upgrades. No fatal flaws or preferences were identified for any of the proposed site alternatives for construction laydown areas and access points.</p>	<ul style="list-style-type: none"> • An Abnormal Load Study should be undertaken once the (i) detail design, (ii) construction programme, and (iii) logistics plan are available. • Dry runs along abnormal load routes should be conducted prior to transporting abnormal loads • Internal access roads should be constructed according to TRH20 – Unsealed Roads: Design Construction and Maintenance • Traffic calming and speed reduction should be implemented at the approaches to the site access during construction • Proper and adequate construction road signage should be used on the approach roads which complies with the South African Road Traffic Signage Manual (SARTSM). • The condition and quality of the gravel roads used should be monitored closely during and after construction, and any required maintenance should be undertaken timeously under the auspices of the relevant transport department. • Farm fences and access cattle grids should be maintained regularly. • The implementation of the mitigation measures identified in the Impact Rating Table should be ensured and monitored.
Visual	<p>The proposed project comprises the development of a SEF, further altering the visual landscape of the project area. This project is moderately congruent with and marginally affects the integrity of the landscape, as there are a number of approved renewable energy facilities around or near the proposed site, with two operational WEFs and a SEF under construction. A highly concentrated network of powerlines exists within the project area and the wider region</p>	<ul style="list-style-type: none"> • Limit vegetation clearance and the footprint of construction to what is absolutely essential. • Consolidate the footprint of the construction camp to a functional minimum. • Avoid excavation, handling and transport of materials which may generate dust under very windy conditions. • Keep stockpiled aggregate and sand covered to minimise dust generation. • Keep construction site tidy

Specialist Study	Findings	Recommendations
	<p>due to the nearby Helios MTS and approved renewable projects. Due to the open, flat and intact topography, the Visual Absorbtion Capacity of the project area is considered low.</p> <p>This project will alter visual quality during the construction and decommissioning phases, as well as alter sense of place, visual quality and result in visual intrusion during the operational phase. The impact of visual discomfort and impaired visibility is assessed to be low significance. These impacts are deemed to be acceptable on the assumption that the mitigation measures listed are implemented.</p> <p>Based on the assessment and the assumption that the mitigation measures will be implemented, the specialist is of the opinion that the visual impacts of the project are acceptable and there is no reason not to authorise the project.</p>	<ul style="list-style-type: none"> • Fence the perimeter of the site with green or black fencing. • Install powerlines underground, where possible. • Fence the perimeter of the site with green or black fencing. • Ensure that the roof colour of the proposed buildings blends into the landscape. • Reduce the height of lighting masts to a workable minimum. • Direct lighting inwards and downwards to limit light pollution.
Risk	<p>There are no fatal flaws associated with either battery technology type for the proposed Lesaka 1 battery installation.</p> <p>The current proposed location of the Lesaka 1 BESS is more than 100m from rivers and are therefore suitable.</p>	<ul style="list-style-type: none"> • The overall design should be subject to a full Hazop prior to finalization of the design. • For the VRFB systems an end of life (and for possible periodic purging requirements) solution for the large quantities of hazardous electrolyte should be investigated, e.g., can it be returned to the supplier for re-conditioning. • Prior to bringing any solid-state battery containers into the country, the contractor should ensure that: <ul style="list-style-type: none"> ○ An Emergency Response Plan is in place that would be applicable for the full route from the ship to the site. This plan would include details of the most appropriate emergency response to fires both while the units are in transit and once they are installed and operating. ○ An End-of-Life plan is in place for the handling, repurposing or

Specialist Study	Findings	Recommendations
		<p>disposal of dysfunctional, severely damaged batteries, modules and containers.</p> <ul style="list-style-type: none"> • The site layout and spacing between lithium solid-state containers should be such that it mitigates the risk of a fire or explosion event spreading from one container to another. • Under certain weather conditions, the noxious smoke from a fire in a lithium battery container could travel some distance from the unit. The smoke will most likely be acrid and could cause irritation, coughing, distress etc. Close to the source of the smoke, the concentration of toxic gases may be high enough to cause irreversible harmful effects. Location of the facilities needs to ensure a suitable separation distance, i.e. 500m, from public facilities/residences etc. and should preferably not be located directly southwest of any occupied facilities • Where there is a choice of alternative locations for the BESS, those that are further from water courses would be preferred. VRFB hazards are mostly related to possible loss of containment of electrolyte and solid-state systems may experience fires that may result in loss of containment of liquids or the use of large amounts of fire water which could be contaminated. One would not want these run-offs to enter water courses directly. The buffer distance between water bodies and the facilities containing chemicals should be set in consultation with a water specialist, possibly 100m minimum separation. The current proposed location of both Lesaka 1 BESS are more than 100m from rivers and are therefore suitable. • Finally, it is suggested once the technology has been chosen and more details of the actual design are available, the necessary updated Risk Assessments should be in place.



Appendix E:

General Avifaunal Monitoring Plan

The following outlines a general monitoring plan (EMP) structure:

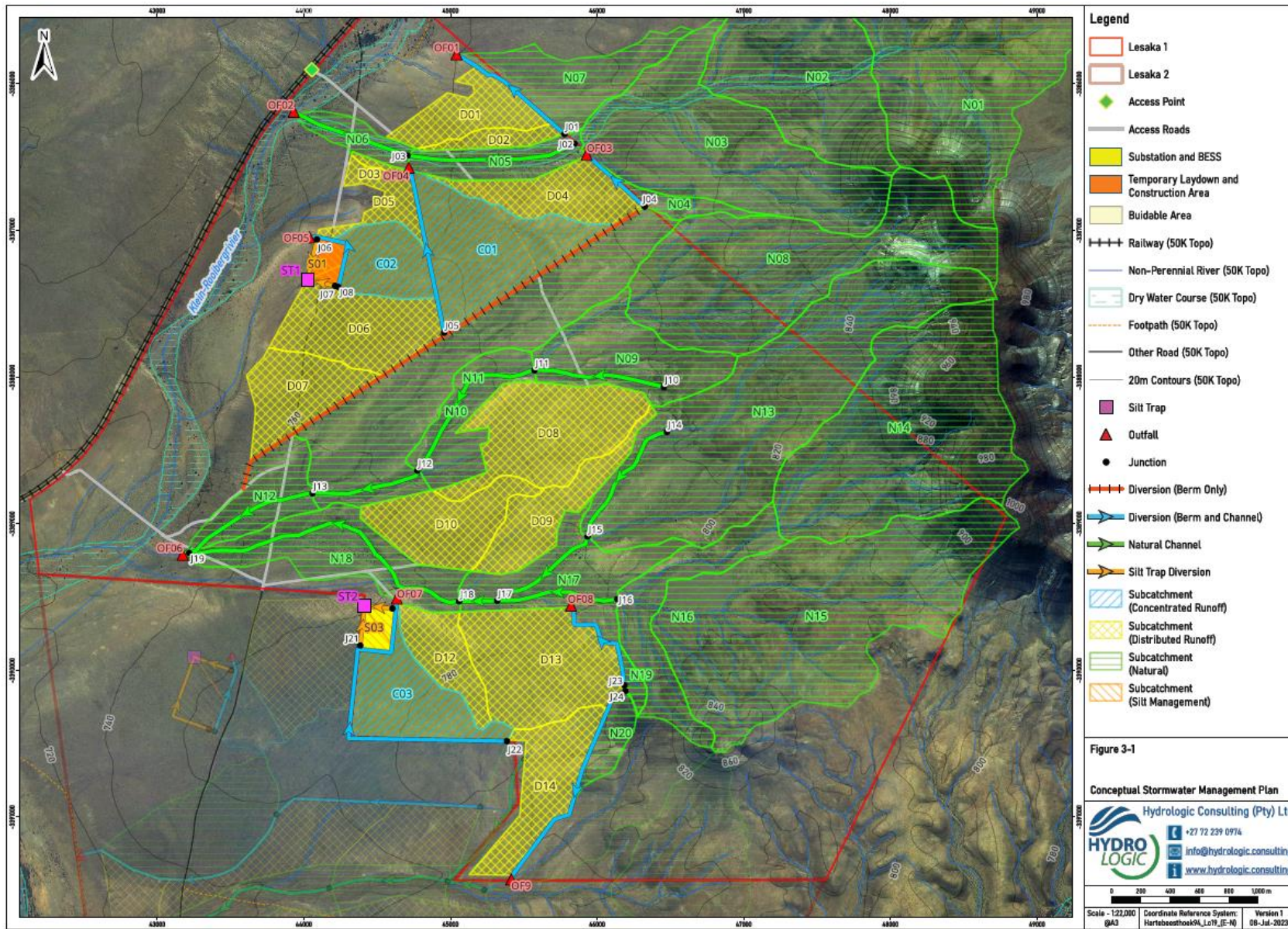
	Title: SCC community monitoring
Stressor	Project Activities, Climatic Changes
Receptor(s)	Avifauna SCC diversity and densities in each habitat type
Variables	Presence/absence of bird species of conservation concern, including observed breeding behaviour, proportion of SCC species present per sample site, species richness and densities.
Sampling Method	<ul style="list-style-type: none"> • Vantage Point counts – 2 x Three-hour counts (morning and evening) to be conducted at each monitoring plot • Drive Transects (species lists) – all species seen to be recorded along set transects to be driven during dawn till pre 10 am; and • Walked Transects (species lists) – all species heard and seen to be recorded along set transects to be walked at dawn chorus
Sampling Frequency	<ul style="list-style-type: none"> • Annual wet and dry season surveys; and • Continuous observations by ECO.
Sampling Site(s)	As provided in EMPr.
Change and Action Thresholds	Loss/decrease in any SCC parameter, unnatural decline (cannot be explained by stochastic weather changes) in species densities and/or richness. Similarly, positive changes (e.g, unusual presence in high densities of nomadic species such as Ludwig's Bustard or establishment of SCC breeding population such as Secretary Bird) in species densities and/or richness that indicate disturbance. Rapid surveys of greater surrounding area should be conducted to attempt to determine cause of change detected.
Data Analysis	All variables acquired should be statistically and graphically compared to the available data and the original targeted baseline data. Photographs should be taken of as many SCC observed in the field.
Reporting requirements	Annual reporting presenting data analysis results and mapping indicating locations of change. Specific reporting on negative change detection not directly attributable to Project activities and their cause. All reporting to be accompanied by GIS shapefiles and any original photographs.

	TITLE: Collision monitoring
Stressor(s)	Avifauna-powerline and infrastructure collisions (incidents)
Receptor(s)	Avifauna community composition, density and distribution
Variables	Species, geographical location and date of every avifaunal mortality
Sampling Method	For powerlines: Weekly surveys before dawn (prior to scavenger activity) by driving slowly along the servitudes and documenting each collision kill location and species (a georeferenced photograph as evidence is required).
Sampling Frequency	Weekly for powerlines
Sampling Site(s)	Along the entire powerline network on the PAOI.
Collision Action Thresholds	Collision frequency and intensity (#kills per species per unit time) will need to be assessed per species by specialist. However, any non-specific collision concentrations (> 10 kills per month clustering in a stretch of powerline) must initiate investigation and corrective measures (additional mitigation infrastructure).
Data Analysis	Geospatial analysis of density and dispersion of avifaunal mortalities highlighting the core areas of mortalities so that corrective measures can be implemented. Time-series and trend analysis to accompany evaluation to inform on temporal fluctuations (e.g., seasonality) and steer adaptive management. Cumulative species-specific summary statistics to be calculated.
Reporting requirements	Bi-annual reporting of faunal avifaunal mortalities associated with collision data highlighting locations where corrective measures are to be taken (if necessary).



Appendix F:

Conceptual Stormwater Management Plan



- Legend**
- Lesaka 1
 - Lesaka 2
 - ◆ Access Point
 - Access Roads
 - Substation and BESS
 - Temporary Laydown and Construction Area
 - Buildable Area
 - Railway (50K Topo)
 - Non-Perennial River (50K Topo)
 - Dry Water Course (50K Topo)
 - Footpath (50K Topo)
 - Other Road (50K Topo)
 - 20m Contours (50K Topo)
 - Silt Trap
 - ▲ Outfall
 - Junction
 - Diversion (Berm Only)
 - Diversion (Berm and Channel)
 - Natural Channel
 - Silt Trap Diversion
 - Subcatchment (Concentrated Runoff)
 - Subcatchment (Distributed Runoff)
 - Subcatchment (Natural)
 - Subcatchment (Silt Management)

Figure 3-1

Conceptual Stormwater Management Plan

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