ACWA POWER SOLARRESERVE REDSTONE SOLAR PHOTOVOLTAIC POWER PLANT

ON THE REMAINING EXTENT OF THE FARM NO. 469, HAY REGISTRATION DIVISION IN THE NORTHERN CAPE PROVINCE

ENVIRONMENTAL MANAGEMENT PROGRAMME

REVISION 1

ACWA Power SolarReserve Redstone Solar Thermal Power Plant (RF) Proprietary Limited

ACWA Power SolarReserve Redstone Solar Thermal Power Plant (RF) Proprietary Limited

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List of Acronyms	
BID	Background Information Document
CA	Competent Authority
CAR	Co-ordinated Avifaunal Road-count
CARA	Conservation of Agricultural Resource Act, Act No 43 of 1983
CEMPr	Construction Environmental Management Programme
CER	Contractor Environmental Representative
COPD	Chronic Obstructive Pulmonary Disease
CSP	Concentrated Solar Power
CWAC	Co-ordinated Waterbird Count
DAFF	Department of Agriculture, Forestry & Fisheries
DEA	Department of Environmental Affairs
DNI	Direct Normal Irradiance
DEA	Department of Environmental Affairs
DENC	Department of Environment and Nature Conservation
DWS	Department of Water and Sanitation
EC	Electrical Conductivity
ECO	Environmental Control Officer
EDI	Electro-deionization
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EIMP	Environmental Implementation and Management Plan
EIMS	Environmental Management System
EMPr	Environmental Management Programme
ERM	Environmental Resources Management
GDP	Gross Domestic Product
GHG	Green House Gas
GN	Government Notice
GRU	Groundwater Resource Units
I&Aps	Interested & Affected Parties
IDP	Integrated Development Plan
IPP	Independent Power Producer
MSDS	Material Safety Data Sheet
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998)
NEM:BA	National Environmental Management: Biodiversity Act 10 of 2004
NEM:WA	National Environmental Management Waste Act 59 of 2008
NHRA	National Heritage Resources Act 25 of 1999
NERSA	National Energy Regulator of South Africa
NGOs	Non-Governmental Organizations
NGDB	National Groundwater Database
OEMPr	Operational Environmental Management Programme
RO	Reverse Osmosis
SAHRA	South African Heritage Resources Agency
SANBI	South African Biodiversity Institute
SDF	Spatial Development Framework
ToR	Terms of Reference

List of Acronyms	
WUL	Water Use License

Definitions and Terminology	
ACCELERATED SOIL EROSION	Soil erosion induced by human activities and ultimately leading to irreversible degradation of the ecosystem and loss of ecosystem functionality.
ALIEN SPECIES	(a) a species that is not an indigenous species; or (b) an indigenous species translocated or intended to be translocated to a place outside its natural distribution range by natural means of migration or dispersal without human intervention. *(NEM: BA, Act No. 10 of 2004)*
ALTERNATIVES	In relation to a proposed activity, means different means of meeting general purpose and requirements of an activity, which may include alternatives to – (a) the property on which or location where it is proposed to undertake the activity; (b) the type of activity to be undertaken; (c) the design or layout of the activity; (d) the technology to be used in the activity; (e) the operational aspects of the activity; and the option of not implementing the activity. *(NEMA EIA Regulations, 2014)*
ASSESSMENT	The process of collecting, organising, analysing, interpreting and communicating information that is relevant to decision-making *(NEMA, Act No. 107 of 1998)*.
BUILDING AND DEMOLITION WASTE	Refers to waste, excluding hazardous waste, produced during the construction, alteration, repair or demolition of any structure, and includes rubble, earth, rock and wood displaced during that construction, alteration, repair or demolition *(NEM: WA, Act No. 59, 2008).*
BUND	An artificial containment wall (embankment) designed to contain spillages of a hazardous nature such as chemicals and hydrocarbons.
BATCH PLANT	A containment area centrally located where cement, water and other related aggregates are mixed to produce concrete and / or cement. The design of this area has to adhere to the specifications set out in the EMPr.
COMPETENT AUTHORITY	In respect of a listed activity or specified activity, means the organ of state charged by this Act with evaluating the environmental impact of that activity and, where appropriate, with granting or refusing and environmental authorisation *(NEMA, Act No 107 of 1998)*. Identified Competent Authority for the PV Power Project is Department of Environmental Affairs.
COMPLAINTS REGISTER	A register containing all contact details of a person who made a complaint, and information regarding the complaint itself.
CONTRACTOR'S ENVIRONMENTAL REPRESENTATIVE (CER)	The CER is employed by the contractor to ensure the contractor complies with the environmental standards, specifications, as well as the conditions and stipulations contained within the Site Documentation. The CER is available on site at all times and has the experience and/or knowledge to deal with environmental issues. The CER is also responsible for the management of all environmental and social related aspects as well as the implementation of this EMPr.
CONTAMINATION	The release/spillage of a substance into an environment where it is not normally found, which is detrimental to that environment, its ecosystems and to humans.
CONTAMINATED	Means the presence in or under any land, site, buildings or structures of a substance or micro-organism above the concentration that is normally present in or under that land, which substance or micro-organism directly or indirectly affects or may affect the quality of soil or the environment adversely *(NEM: WA, Act No. 59, 2008).*
CONTRACTOR	The individual and/or company that are responsible for the development and/or construction

Definitions and Terminology	
	activities related to the proposed project. The Contractor is further responsible for the implementation of and compliance of all relevant legislation, and with the conditions and stipulations contained within the Site Documentation.
CONSTRUCTION SITE CAMP	The construction site camp refers to the designated area where the contractor's offices (temporary), and associated infrastructure will be located during the construction period of the proposed project.
CORRECTIVE (OR REMEDIAL) ACTION	Reactive response required to address an action that is in conflict with the requirements of the Site Documentation. The need for corrective action may be determined through monitoring, audits or management review.
DEVELOPMENT FOOTPRINT	Area on a project site that is impacted by the development activity.
DOMESTIC WASTE	Means waste, excluding hazardous waste that emanates from premises that are used wholly or mainly for residential, educational, health care, sport or recreation purposes; *(NEM: WA, Act No. 59, 2008).*
DECOMMISSIONING	To take out of active service permanently or dismantle partly or wholly, or closure of a facility to the extent that it cannot be readily re-commissioned *(NEMA EIA Regulations, 2010, GNR 544)*.
ECOSYSTEM	A dynamic system of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit *(NEMA, Act No 107 of 1998).*
ENDANGERED SPECIES	Any indigenous species listed as an endangered species in terms of section 56 (of the NEM:BA, Act No 10 of 2004)
ENDEMIC	An "endemic" is a species that grows in a particular area (is endemic to that region) and has a restricted distribution. It is only found in a particular place. Whether something is endemic or not depends on the geographical boundaries of the area in question and the area can be defined at different scales.
ENVIRONMENT	Means the surrounding within which a human exist and that are made up of: • The land, water and atmosphere of the earth; • Micro-organism, plant and animal life; • Any part or combination of (i) and (ii) and the interrelationships among and between them; and The physical, chemical aesthetical and cultural properties and conditions of the foregoing that influence human health and wellbeing *(NEMA Act 107 of 1998)*.
ENVIRONMENTAL ASSESSMENT PRACTITIONER	The individual responsible for the planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management plan or any other appropriate environmental instruments introduced through regulations *(NEMA, Act No 107 of 1998).*
ENVIRONMENTAL AUTHORISATION	"environmental authorisation", when used in Chapter 5, means the authorisation by a competent authority of a listed activity or specified activity in terms of this Act, and includes a similar authorisation contemplated in a specific environmental management Act; *(NEMA, Act No 107 of 1998).*
ENVIRONMENTAL AUDIT	Means work done to identify and evaluate compliance of the statement and the residual environmental impact of an existing activity, the effectiveness of mitigation measures and the functioning of monitoring mechanisms *().*
ENVIRONMENTAL AUDIT REPORT	Means a report contemplated in regulation 34. *(NEMA EIA Regulations, GNR982, 2014).*
ENVIRONMENTAL CONTROL OFFICER	The ECO is an independently appointed duly qualified individual that is appointed to ensure the conditions and measures identified in the EMPr, Environmental Authorisation and all other relevant environmental permits are implemented and adequately monitored. The ECO is responsible to

Definitions and Terminology	
(ECO)	report any non-compliances to the competent authority, and will keep a daily record of all incidents.
ENVIRONMENTAL IMPACT	Change in an environment resulting from the effect of an activity on the environment, whether positive or negative. Impacts may be the direct consequence of an individual's or organisation's activities or may be indirectly caused by them (NEMA).
ENVIRONMENTAL IMPACT ASSESSMENT (EIA)	Means the systematic process of identifying, assessing and reporting environmental impacts associated with an activity and includes the basic assessment report and or scoping and environmental impact assessment reports (NEMA, EIA Regulations 982 of 2014).
ENVIRONMENTAL MANAGEMENT	Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.
ENVIRONMENTAL MANAGEMENT PROGRAMME	A programme required in terms of section 24 of the NEMA. A detailed action plan prepared for the Project to ensure that the recommendations for minimising and reducing negative environmental impacts as well as enhancing positive environmental impacts are implemented during the Project's life-cycle. This EMPr focuses on the pre-construction, construction, and operation & maintenance phase.
EROSION	The loss of soil through the action of water, wind, ice or other agents, including the subsidence of soil *(Conservation of Agricultural Resource Act, Act No 43 of 1983).*
GENERAL WASTE	Waste that does not pose an immediate hazard or threat to the environment or health, and includes: • domestic waste; • building and demolition waste; • Business waste: and • inert waste. *(NEM: WA, Act No. 59, 2008).*
HABITAT	A place where a species or ecological community naturally occurs *(NEM: BA Act No. 10 of 2004)*
HARM:	Means interference with the ecological systems of which the living organisms form part and in case of a living person includes harm, distress or annoyance to any of his senses or damage to his property.
HAZARD:	Means a source of or exposure to danger *(NEMA).*
HAZARDOUS WASTE:	Any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment *(NEM: WA).*
HERITAGE:	That which is inherited and forms part of the National Estate (historical places, objects, fossils as defined by the *National Heritage Resources Act 25 of 1999*).
HERITAGE RESOURCE	Any place or object of cultural significance. *(National Heritage Resource's Act No 25 of 1999*
HERITAGE SITE	A place declared to be a national heritage site by SAHRA or a place declared to be a provincial heritage site by a provincial heritage resources authority. *(National Heritage Resource's ActNo 25 of 1999)*
IMPACT	A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.
INTERESTED AND AFFECTED PARTY (I&AP)	Individuals and/or peer groups that are and/or maybe affected albeit positive or negative by the proposed activity. IAP's include authorities, local communities, environmental interest groups, and the general public.

Definitions and Terminology	
INDIGENOUS	All biological organisms that occurred naturally within the study area prior to 1800.
INCIDENT	An undesired event which may result in a significant environmental impact but can be managed through internal response.
MITIGATION	Measures designed to avoid, reduce or remedy the proposed adverse impacts (*DEAT, 1998*).
MONITORING	The repetitive and continued observation, measurement and evaluation of environmental criteria to follow changes over a period of time and to assess the efficiency of control measures *(DEAT, 1998)*.
PRE-CONSTRUCTION:	Pre-construction entails planning, design and detailing of the development components prior to the commencement of the construction phase.
PREVENTATIVE ACTION:	A predetermined action to address potential problems before they develop into situations which would be contrary to the requirements of the EMPr. Preventative action is most often determined from the results of monitoring and audits during management review.
PROJECT APPRAISAL:	The collection and evaluation of detailed information concerning a proposed project, usually to assess risk associated with it.
POLLUTION:	Means any contamination or change in the environment caused by: • Substances; • Radioactive or other waves; or • Noise, odours, dust or heat Emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or organ of state, where that change has an adverse effect on human health or wellbeing or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future (*NEMA, Act No. 107 of 1998)*.
RARE SPECIES	Taxa with small world populations that are not at present Endangered or Vulnerable, but are at risk as some unexpected threat could easily cause a critical decline. These taxa are usually ocalized within restricted geographical areas or habitats or are thinly scattered over a more extensive range. This category was termed Critically Rare by Hall and Veldhuis (1985) to distinguish it from the more generally used word "rare".
RED DATA SPECIES	Species listed in terms of the International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species, and/or in terms of the South African Red Data list. In terms of the South African Red Data list, species are classified as being extinct, endangered, vulnerable, rare, indeterminate, insufficiently known or not threatened (see other definitions within this glossary).
REHABILITATION:	Return of a disturbed area to a state which approximates the state (wherever possible) which it was before disruption.
SITE ENGINEER (SE):	The SE is the Project Proponents' representative onsite. The SE authority to issue instructions and oversees the operations of the contractor. Upon request from the CER/ECO the SE has the mandate whereby, in emergency circumstances, he may override the instructions of the contractor.
SITE DIARY	A daily site diary will be kept on site by the EM to record any incidents and non-compliances.
SOLID WASTE:	All waste, including construction debris, chemical waste, excess cement/concrete, wrapping material, timber, tins and cans, drums, wire, nails, domestic, dead organic waste, asphalt products *(City of Cape Town: Standard Environmental Specification Version 6:2007)*.
PROJECT:	The ACWA Power SolarReserve Redstone Solar Thermal Power Plant is a Concentrated Solar Power (CSP) Central Receiver Tower plant, with molten salt as heat transfer fluid and storage medium that has a generation capacity of up to 100MW.

Definitions and Terminology	
PROJECT SITE	The remaining extent of the Farm No 469, Hay District (registration), Tsantsabane Local Municipality, in the ZF Mgcawu District, in the Northern Cape Province.
SITE DOCUMENTATION:	In this document, "*Site Documentation"* refers to all relevant documentation that pertains to the licensing, development, construction, operation and management of the Project Site: • All permits, licenses and authorisations; • Mitigation strategies; • Method statements and standard operating procedures; • Site Operation, Management and Maintenance Plans; • Site Design Documentation and final site layout plan; • Environmental Management Programme; and • Written instructions from the CA.
WASTE	Any substance, whether or not that substance can be reduced, re-used, recycled and recovered – (a) that is surplus, unwanted, rejected, discarded, abandoned or disposed of; (b) which the generator has no further use of for (he purposes of production; (c) that must be treated or disposed of; or (d) that is identified as a waste by the Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector, but— (i) a by-product is not considered waste; and (ii) any portion of waste, once re-used, recycled and recovered, ceases to be waste; *(NEM: WA, Act 59 of 2008)*
WATER POLLUTION:	The National Water Act, 36 of 1998 defined water pollution to be the direct or indirect alteration of the physical, chemical or biological properties of a water resource so as to make it – less fit for any beneficial purpose for which it may reasonably be expected to be used; or harmful or potentially harmful (aa) to the welfare, health or safety of human beings; (bb) to any aquatic or non-aquatic organisms; (cc) to the resource quality; or (dd) to property.
WATERCOURSE:	(a) a river or spring; (b) a natural channel or depression in which water flows regularly or intermittently; (c) a wetland, lake or dam into which, or from which, water flows; and/or (d) d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse as defined in the *National Water Act, Act No. 36 of 1998* and a reference to a watercourse includes, where relevant, its bed and banks.
WETLAND:	Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

1. PROJECT DESCRIPTION

1.1. BACKGROUND TO PROJECT

The ACWA Power SolarReserve Redstone Solar Thermal Power Plant RF (Pty) Ltd, the Applicant, proposes the development, construction and operation of the ACWA Power SolarReserve Redstone Solar Photovoltaic Power Plant (the **"PV Power Project**") on The Remaining Extent Of The Farm No. 469, Hay Registration Division in The Northern Cape Province **("Project Site"**). ACWA Power SolarReserve Redstone Solar Thermal Power Plant RF (Pty) Ltd, (the Applicant), has received an environmental authorization to construct and operate a Concentrated Solar Power Plant (CSP) on the Remaining Extent of the Farm No. 469 the Hay Registration Division (the **"Project Site"),** called the ACWA Power SolarReserve Redstone Solar Thermal Power Plant (**Redstone CSP Project)** (authorised by the Department of Environmental Affairs, DEA reference number 12/12/20/2316). The PV Power Project will be used to supply the auxiliary power load requirements of the Redstone CSP Project. The PV Power Project will have a generation capacity of up to 20 MW Peak (DC) which is a design capacity of ~15MWAC, with up to 30MWhours of battery storage, on the Remaining Extent of the Farm 469, Hay District. The planned PV Power Project will be located approximately 30 km east of the town Postmasburg in the Northern Cape Province, adjacent to the Redstone CSP Project. The Project Site location is illustrated in Figure 1 below.

The Project Site is located within the governing boundaries of the Tsantsabane Local Municipality and the ZF Mgcawu District Municipality. The PV Power Project is designed to allow the Redstone CSP Project to generate renewable green energy for self-consumption in order to operate and run the auxiliary load requirements of the Redstone CSP Project. Details on the proposed power generating technology; auxiliary services and infrastructure; and project phases and associated activities are provided below.

Description of affected farm Portions	Remaining Extent of the Farm 469, Hay District Tsantsabane Local Municipality ZF Mgcawu District Municipality
Geographical coordinates	Option A North West Corner 28°17'17.66"S 23°21'24.07"E North East Corner 28°17'13.55"S 23°21'43.68"E South East Corner 28°18'30.25"S 23°21'29.86"E South West Corner 28°18'3.92"S 23°21'4.76"E Option B[1] North West Corner 28°17'14.05"S 23°21'22.24"E Norther Corner 28°17'2.31"S 23°22'14.91"E Eastern Corner 28°17'38.39"S 23°23'32.43"E Southern Corner 28°19'23.65"S 23°22'42.66"E Western Corner 28°18'19.00"S 23°20'55.16"E
Photographs of the area that provide a visual perspective of the entire site	Refer to {Appendix 5 of the bar}
Generation capacity	Up to 20MW
Type of technology	Crystalline - fixed or tracking
Structure heights	~3 – 5m above ground (PV Module)
Surface area to be covered	Less than 20ha
Structure orientation	North facing PV power blocks with inverter and transformer collection
Laydown area dimensions	Not applicable – the PV Power Plant will share infrastructure with the Redstone CSP Project. No new areas required for this purpose.

[1] Includes only property area to the north of the railway line.

Supplementary facilities and services	Substations and electrical systems Access and security services Operational power supply and use Water supply and use Procurement, storage and use of consumables Maintenance and repair to operational equipment Waste management Emissions management Storm-water management infrastructure Management and administration Staff facilities Fire protection

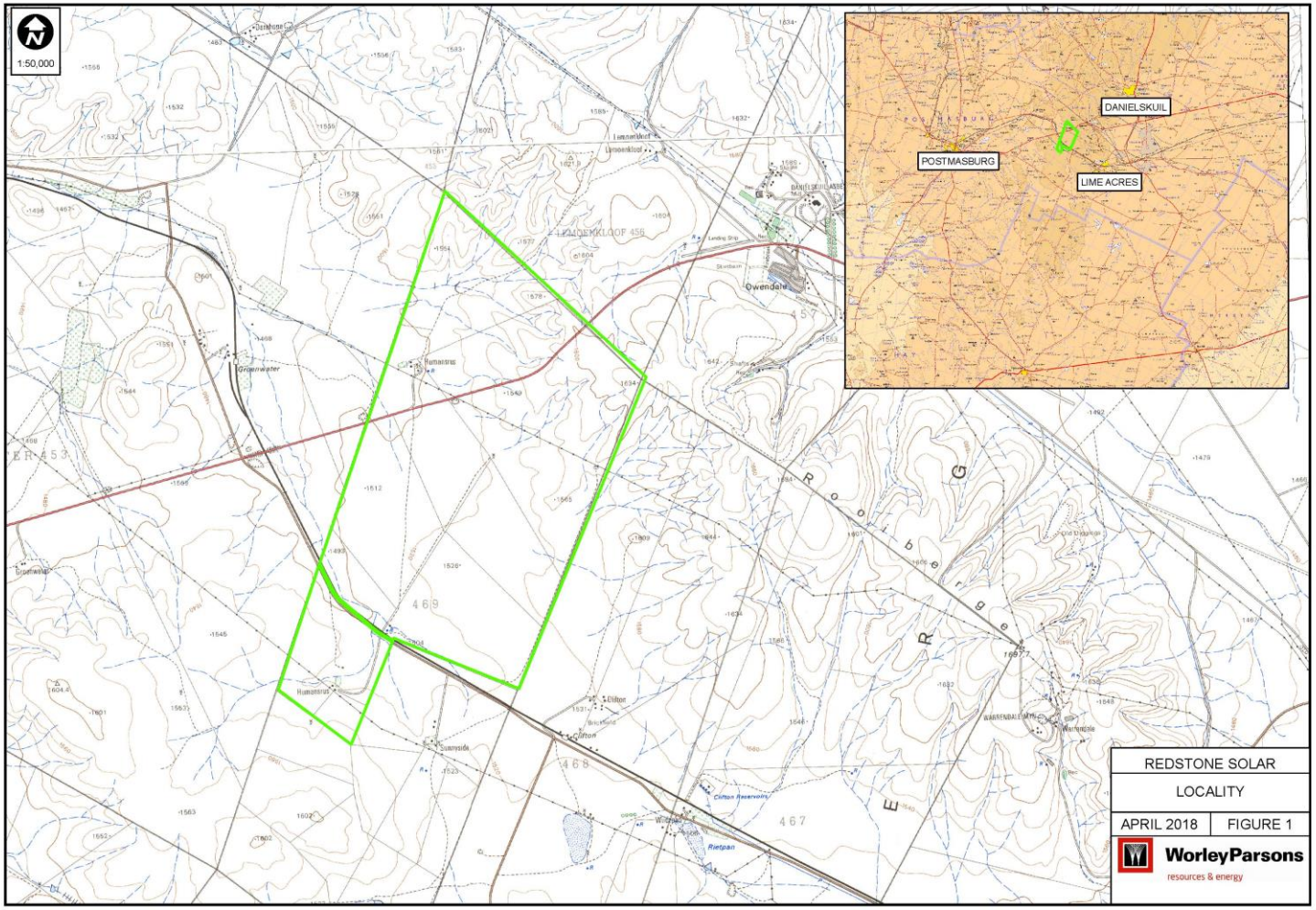


Figure 1: Locality Map of the ACWA Power SolarReserve Redstone Solar Photovoltaic Power Plant Development Footprint

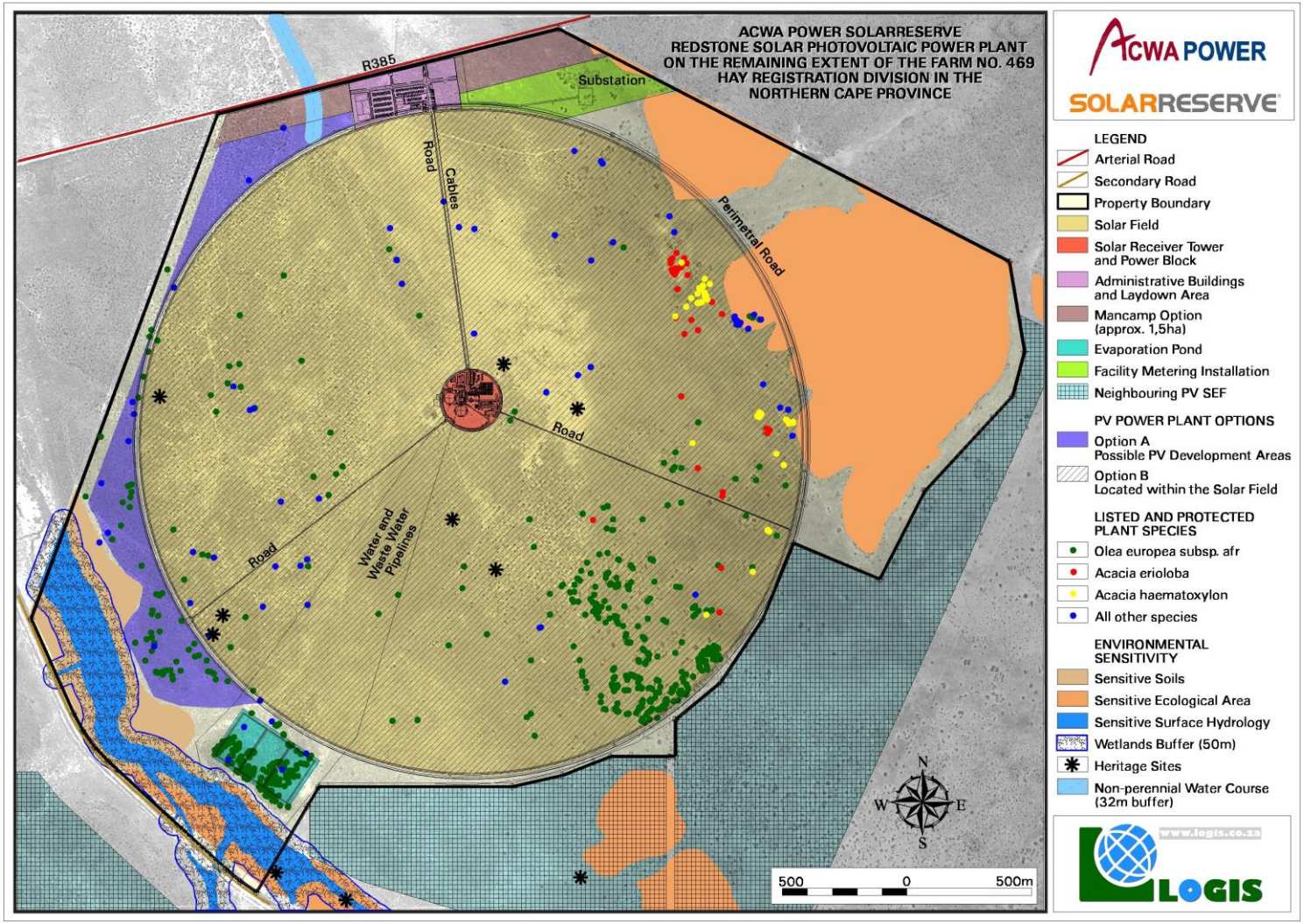


Figure 2: Sensitivity Map of the ACWA Power SolarReserve Redstone Solar Photovoltaic Power Plant Development Footprint

1.2. STRUCTURE OF THE EMPR

The EMPR consists of the following components:

Section 1: Introduction	Provides background information regarding the site, the proposed development and the EMPr.
Section 2: Implementation of the EMPR	Provides details of the communication and organisational structures within which the EMPr will be implemented, responsibilities of key role players, and provides the terms of reference for the ECO.
Section 3: Environmental Management Specifications for the planning and design phase	Provides environmental specifications for the planning and design phase.
Section 4: Environmental Management Specifications for the pre- construction phase	Provides environmental specifications for the pre-construction phase.
Section 5: Environmental Management Specifications for the Construction Phase	Provides all construction phase environmental management requirements applicable to the principal construction contractors, and their subcontractors.
Section 6: Environmental Management Specifications for the Operational Phase	Provides all operational phase environmental management requirements applicable to applicant and any sub-contractors.
Section 7: Environmental Management Specifications for the Decommissioning and Closure	Provides all decommissioning and closure phase environmental management requirements applicable to applicant and any sub-contractors.

2. IMPLEMENTATION OF THE EMPR

2.1. BACKGROUND TO THE EMPR

An Environmental Management Program for the proposed PV Power Project has been developed according to the following documents:

- Provisions of Chapter 5 of the National Environmental Management Act 107 of 1998 Section 24N
- EIA Regulations National Environmental Impact Assessment Regulations, 326 of 2014, as amended in 2017 Appendix 4.

Appendix 4: EMPR Content	Reference Location in EMPR
a) Details of the EAP	Section 2.3
b) Description of aspects of activity covered	Section **Error! Reference source not found.**
c) Sensitivity Map/Layout	Section **Error! Reference source not found.**
d) A description of the impact management objectives, 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 3 Section 5 Section 6 Section 7
f) Description of the proposed impact management actions	Section 3 Section 5 Section 6 Section 7
g) Method of monitoring the implementation of management actions	Section 3 Section 5 Section 6
h) Frequency of monitoring the implementation of management actions	Section 3 Section 5 Section 6 Section 7
i) Responsible person/s i.t.o. implementation of management actions	Section 2.7
j) Time period within which impact management actions contemplated must be implemented	Section 3 Section 5 Section 6 Section 7
k) Mechanism for monitoring compliance with the management actions contemplated in paragraph (f)	Section 3 Section 5 Section 6 Section 7
l) Compliance reporting programme	Section 3 Section 5 Section 6 Section 7
m) Environmental awareness plan	Section 3 Section 5 Section 6 Section 7
n) Authority information requirements	N/a

This document describes mitigation measures in detail, and is partly prescriptive, identifying specific people or organisations to undertake specific tasks in order to ensure that impacts on the environment are minimised during the lifecycle of this project. The EMPr is applicable to all works comprising the planning and design, pre-construction, construction and operation of the PV Power Project.

It is a dynamic document implying that information gained during planning and design, pre-construction, construction and operational activities and/or monitoring of procedures on site could lead to changes in the EMPr, which will require the EMPr to be amended and updated accordingly. The appointed Environmental Manager (EM) will monitor compliance with the EMPr and other conditions of approval or authorizations as they relate to environmental matters as implemented by the Contractor. This EMPr gives direction and guidance to all responsible parties. The responsible parties are expected to co-operate closely to minimise or avoid unnecessary environmental impacts.

Non-compliance penalties are described in this EMPr and are thus to be included into the official contract documentation. The Contractor is obliged to inform the EM immediately of events that may cause serious environmental damage or breach the requirements of the EMPr. The EM in turn will immediately inform the Site Engineer (SE), Environmental Control Officer (ECO) and the Project Company. The ECO will if necessary inform the Local, Provincial and or National Authority, of such events.

2.2. OBJECTIVES OF THE EMPR

The aim of an EMPr is to facilitate appropriate environmental input during all phases of the project implementation. To achieve this, the EMPr makes recommendations for the – (i) **planning and design** (ii) **pre-construction** phase, (iii) specifying the limitations the contractor must abide by during **construction**, detail the issues that should be taken cognisance of and indicate specific actions that must be undertaken so as to ensure that the environment is not unnecessarily damaged. The EMPr thus specifies the framework within which the contractor(s) must carry out (iv) **operations**. The EMPr lastly (v) provides a guideline for works required during the **closure and decommissioning** of the proposed Project Site.

In addition, the EMPr provides a clear indication of the environmental management requirements of each of the role players involved during the construction and operational phases of project implementation. Guidance is provided including the management of method statements which are required to be implemented to achieve compliance with the Environmental Specifications. Corrective actions and penalties in the event of non-compliance with the EMPr are also defined.

Due to the nature of the technology employed (i.e. ability to refurbish and upgrade), the inherent human need for electricity and the initial lifespan of such a facility (25+ years), it is unlikely that the Project Site will be closed or decommissioned within the next 25 years. However, in order to ensure the EMPr addresses all possible impacts associated with the project implementation, a rehabilitation and site closure component have been included which will allow the Project Company to rehabilitate areas cleared and/or negatively impacted during the construction and operations of the facility thus restoring some ecosystem function.

2.3. EXPERTISE OF THE CONSULTANT RESPONSIBLE FOR COMPILATION OF THE EMPR

Refer to Appendix 1 for detailed CV.

Name	**Taryn**
Surname	Bigwood
Company	Environmental Management Assistance (Pty) Ltd
Position	Environmental Assessment Practitioner
Location	Plot 1 Modder East Orchards Delmas 2210
Email	taryn.bigwood@emassistance.co.za
Telephone Number	0763982391
Education	- B Soc Sci Environmental Management and Geography University of Kwa-Zulu Natal (Kwa-Zulu Natal) - B Soc Sci: Geographical Science (Hons) University of Pretoria (Gauteng) - MA Geography (Research: GEOMORPHIC IMPACT OF ELEPHANTS ON TEMBE ELEPHANT PARK, KWA-ZULU NATAL) University of Pretoria

	(Gauteng) - In Process: PhD Environmental Science (Research: ENVIRONMENTAL RISKS ASSOCIATED WITH ENGINEERING PRACTICES: IMPACT OF DESIGN ON ENVIRONMENTAL CONDITIONS) University of South Africa (Gauteng)
Professional skills	- Taryn is at Present undertaking her PHD in Environmental Management with the topic crosscutting environmental management and civil engineering, she has a Research Masters in Geography specializing in Geomorphology from the University of Pretoria, combined with 15 years of experience in conservation, scientific services, ecological reporting, mining, waste management, Renewable energy (Solar and Wind), Environmental Compliance (Grade 2 Environmental Management Inspector), Environmental licensing, Environmental auditing and water resource development. - Taryn was trained to be an EMI in Cape town in 2011 and was designated by the minister as a grade 2 EMI as the environmental manager of the iSimangaliso Wetland Park Authority. After being designated, Taryn was involved with many environmental, crimes, undertaking administrative justice (writing pre-compliance notices and compliance notices), audits (beach and all developments and lodges in the park and the buffer zone), investigations and inspections in the park authority, she was also involved with the National team of EMIs at times where she represented the authority at cop 17 organisation committee, working group 2,3 and 4 meetings, (which sets objectives for compliance, environmental and estuaries to be presented to the minister at MIMEC and MTECH). - Her extended experience results in a wide-range of environmentally related projects, processes and applications for private, commercial and industrial clients, in addition to provincial and national government departments as Environmental Manager, Director, Environmental Consultant, Soil Erosion specialist, Compliance Manager, Environmental Management, EMI, Chief Research Technician, Acting Ecologist, Geomorphology Lecturer, Assistant Cartographer, and Field Guide. -

2.4. CONTRACTUAL OBLIGATION

This EMPr will be included in all contract documentation associated with the PV Power Project. The content of this EMPr is relevant and binding on the activities associated with the planning and design, pre-construction, construction and operation & maintenance, decommissioning and rehabilitation of the Project.

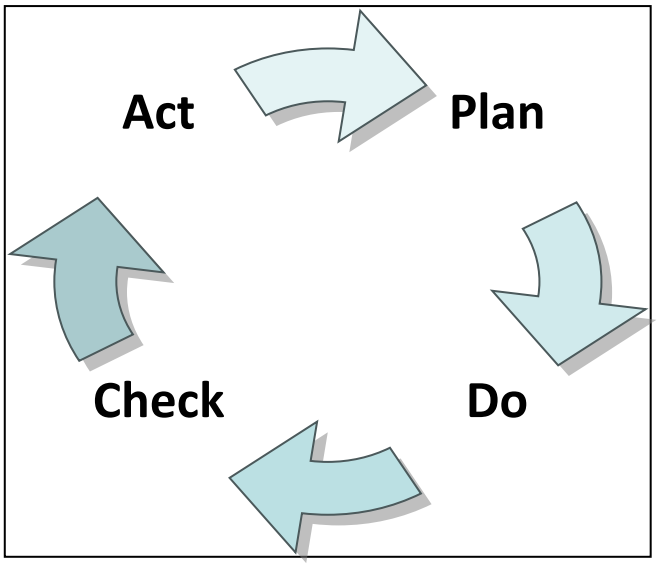
2.5. ENVIRONMENTAL MANAGEMENT APPROACH

The environmental management approach is based on the rationale of the South African Legislation, the Environmental Management Policy, the Environmental Implementation and Management Plan (EIMP) (which promotes and enforces that an Environmental Management System (EIMS) to be used) and the Deming Cycle (EIMS system).

The Deming cycle can be broken down into 4 steps, Planning, doing, checking and acting on the non-compliances. This is therefore a simplified continuous improvement approach and the model below outlines the function:

- Plan : Establish the objectives and processes necessary to deliver results in accordance with the applicable organisation's environmental policy.
- Do : Implement the process.

- Check : Monitor and measure processes against environmental policy, objectives, legal and other requirements and report the results.
- Act : Take actions to continually improve environmental performance.



The Nature of the Deming cycle allows for the EMS to be adaptive by promoting continual improvement (Figure 3). Continual improvement is achieved by periodic monitoring and review of the EMPr and the subsequent implementation of corrective actions when required. Combining the "EMS" rationale translates into the environmental management philosophy and the approach in developing this EMPr.

Figure 3: The Deming Cycle

The EMPr approach based on the EMS rationale is summarised and mapped from the legal liability through the EIMP to the EMPr.

2.6. INSTITUTIONAL MATTERS

The key role-players during the construction phase of the development, for the purposes of environmental management on site, include but are not limited to – the Project Company and Project Manager (PM), the Environmental Manager (EM), the main Contractors (Engineering, Procurement and Construction & Operations (EPC) & Maintenance), the Environmental Control Officer (ECO), Site Engineer (SE), and the Contractors Environmental Representative (CER).

Details of the Lines of communication and responsibilities of each of the key role-players have been provided in section 2.7 and Figure 4.

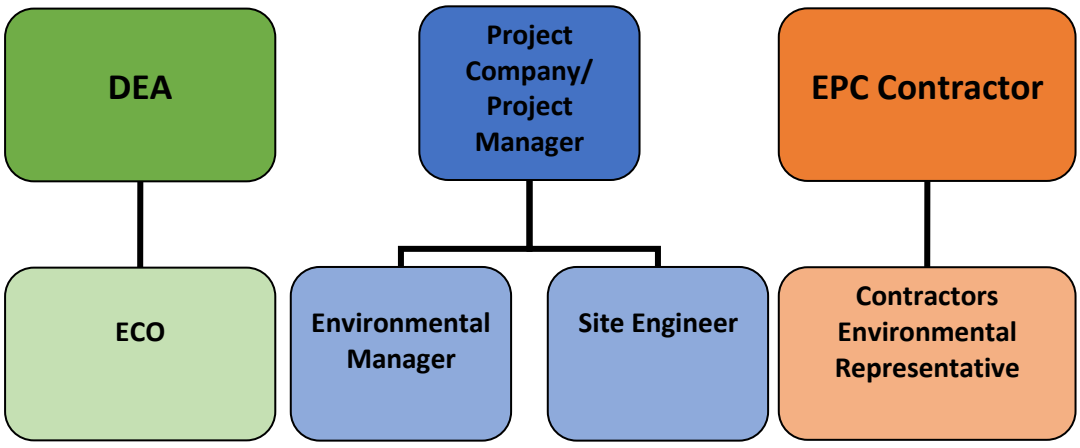


Figure 4: Organogram of roles and responsibilities

2.7. ROLES AND RESPONSIBILITIES

2.7.1. THE PROJECT COMPANY & PROJECT MANAGER (PM)

The Project Company will appoint a PM, who will be responsible for overall management of the Project, overseeing all tasks proposed during construction and operations & maintenance.

The Project Company will notify the Competent Authority (CA), of the appointment of the ECO and the start date proposed for the commencement of construction activities. This task will be undertaken by the Project Manager.

Tasks that are allocated to the PM will include but is not limited to

- Ensuring the contractors are aware of the conditions in the EA and the EMPr;
- Ensuring that the prospective Contractors adequately provide for the provisions of the EMPr
- Appointing an independent suitable qualified ECO to objectively monitor implementation of relevant environmental legislation and requirements of the EMPr for the project.
- Support and provide mandate to enable the ECO and CER to perform their responsibilities.
- Ensuring that the ECO is integrated as part of the project team and as access to the project site.
- Establishing and maintaining proactive communications with the Contractor and ECO.
- Undertaking periodic site visits and inspections to ensure that the environmental requirements are implemented.
- Giving instructions on any procedures and corrective actions
- Action the mitigation measures as proposed by the ECO from time to time.

2.7.2. THE ENVIRONMENTAL MANAGER

In addition to the ECO, the Project Company will appoint its own EM. The EM will be the primary person responsible for overseeing the monitoring and implementation of EMPr provisions and all conditions contained within the Site Documentation.

The EM will report directly to the PM and will oversee the permitting process during the construction and operation & maintenance phases, ultimately ensuring that the respective Contractors' are in the possession of the necessary authorisations/permits/licenses as required throughout the Construction and Operational phases of the Project. This action will be guided by the stipulations in the Engineering, Procurement and Construction (EPC) and Operation & Maintenance (O&M) contracts. He will be responsible for full compliance of the conditions in the permits, EMPr and the EA.

The EM will be the custodian of all Site Documentation responsible and will be responsible for ensuring all Site Documentation is up to date and relevant.

2.7.3. ENVIRONMENTAL CONTROL OFFICER (ECO)

The Project Company will appoint an independent ECO with relevant and appropriate experience or expertise for the construction phase of the development prior to the commencement of the construction phase. The ECO will be responsible to ensure that the conditions referred to in the EA, all other relevant environmental consents and the Site Documentation, are implemented to ensure compliance with the provision of this EMPr.

The ECO will operate independently to objectively monitor the implementation of the conditions and stipulations contained within the Site Documentation.

It is the responsibility of the ECO to monitor the degree of compliance to environmental legislation and the conditions stipulated in the Site Documentation. A daily site diary will be kept and compliance inspections will take place at regularly scheduled intervals.

The ECO will keep records of all activities on site, problems identified and transgressions. He/she will be responsible to maintain a detailed incident and complaint register on site along with a method statement on how these items are to be addressed and/or list mitigation measures that will remedy the issue.

The ECO will be responsible for the submission of all monitoring reports to the relevant CA's. The ECO will be responsible for keeping copies of all reports submitted to the Department as well as relevant communications, the scheduling of activities and the monitoring of such activities.

The ECO has the authority to stop works if in his/her opinion the operation imposes a serious threat to the environment or if an incident has occurred due to neglect or disregard. Any non-compliance recorded in terms of the conditions and stipulations of the Site Documentation, constitutes as a breach of Contract allowing the ECO to suspend part or all of the works, as required.

The ECO will be the official liaison between the CA and the Project Company, and must handle all sensitive information originating from whistle blowers and incidents and report these to the regulating authorities.

2.7.4. SITE ENGINEER (SE)

The SE a registered professional engineer appointed by the Project Company, as the site representative.

The SE has the authority to issue instructions and oversees the operations of the EPC Contractor. Upon request from the EM/ECO the SE has the mandate whereby, in emergency circumstances, he may override the instructions of the Contractor.

The SE is responsible for overseeing site works, issuing site instructions and variation orders to the Contractors, following request by the CER or ECO. The SE may act as the liaison with the Contractor and ECO on behalf of the PM.

The scope of involvement for the SE will cease at the end of the rehabilitation period, post construction of the Project.

2.7.5. CONTRACTOR'S ENVIRONMENTAL REPRESENTATIVE (CER)

The CER is employed by the EPC Contractor to ensure that the EPC Contractor complies with the environmental standards, specifications, as well as the conditions and stipulations contained within the Site Documentation. The CER is available on site at all times and has the experience and/or knowledge to deal with environmental issues. It is furthermore the responsibility of the CER to communicate the contents of the Site Documentation to all staff working for and / behalf of the Contractor.

The person appointed as CER will have to be knowledgeable in the concepts of integrated environmental and waste management, have a sound background on environmental and waste management legislation and be suitably qualified / experienced.

The CER needs to ensure that all personnel working for and/or on behalf of the EPC Contractor and the O&M Contractor understands the concept of integrated environmental and waste management and the various issues specific to the site they are working on. The CER has the prerogative to issue non-conformances to the Contractors, hazard and risk certificates and fines if deemed suitable. A CER will be on site during both the construction and operational phases.

The CER will be responsible for the life of Project for the following tasks:

- Understanding the EMPr and all its specifications and implications.
- Ensuring that all aspects and specifications of the EMPr and approved Method Statements are implemented by the Contractors and their representatives.
- Reviewing and commenting on environmental compliance assessments and reports.
- Recording and informing the PM and ECO of incidents or problems while implementing the EMPr as well as recommending ways of resolving these incidents or problems.
- Reporting and recording all accidents and incidents to the ECO.
- Recording all public complaints received and immediately informs the ECO of these. Ensuring that proper records are kept of all compliance status/feedback reports, incident reports and complaints register and that these documents are available for auditing by the PM, CA or ECO upon request. Communicating the content of the ECO reports and any advice received from the ECO (verbally / in writing) to Contractor and Sub- contractors employees. Designating the working areas and ensuring that these are managed (including sensitive environments) as per the approved construction site

layout plan.

2.8. COMMUNICATION STRUCTURES ON SITE

2.8.1. SITE MEETINGS DURING CONSTRUCTION PHASE

The EM is required to attend all site meetings of the project management team to facilitate the transfer of information and to update all parties on the environmental compliance of the project as a whole, and minute requirements.

The EM will present a summary report outlining the environmental compliance status or offer impute into the discussions in terms of the environment and all related legislation.

The minutes of these meetings will form part of the construction phase of the EMPr records. These minutes will reflect environmental queries, agreed actions and dates of eventual compliance by the Contractor.

The following people should attend these meetings:

- Project Company' Representative;
- Site Engineer;
- EM;
- ECO
- Contractor(s) Environmental Representative

2.8.2. ENVIRONMENTAL EDUCATION PROGRAMME

The Contractor in consultation with the EM and the ECO shall arrange for a presentation to site staff to familiarise them with the environmental aspects of the construction phase of the EMPr within seven (7) days from the commencement date of construction. This presentation should take cognizance of the level of education, designation and language preferences of the staff. General site staff would commonly receive a basic environmental awareness course highlighting general environmental "do's and don'ts" and how they relate to the site.

Management on site e.g. site agents and foremen, who require more detailed knowledge about the environmental sensitivities on site and the contents and application of the construction phase of the EMPr document itself, will benefit from a separate presentation dealing with these issues. The EM may call upon the services of a specialist environmental education translator should this be required.

Environmental awareness training sessions shall be run for all personnel on site. Contractor general site staff are to attend an environmental induction training of approximately 30 minutes prior to commencing with activities on site. In addition, all staff shall attend twice weekly environmental toolbox talks as provided for by the EM.

The EM shall keep a register of all personnel attending the Environmental Education Session.

2.8.3. METHOD STATEMENTS

The Contractor shall provide Method Statements for approval by the EM and the SE prior to work commencing on aspects of the project deemed or identified to be of greater risk to the environment and/or which may not be covered in sufficient detail in the construction phase of the EMPr, when called upon to do so by the SE and EM.

A Method Statement is a "live document" in that modifications are negotiated between the Contractor and the EM/project management team, as circumstances unfold. All Method Statements will form part of the construction phase of the EMPr documentation and are subject to all terms and conditions contained within the construction phase of the EMPr.

Note that a Method Statement is a 'starting point' for understanding the nature of the intended actions to be carried out and allows for all parties to review and understand the procedures to be followed in order to minimise risk or harm to the environment.

Changes to, and adaptations of Method Statements can be implemented with the prior consent of all parties.

A Method Statement describes the scope of the intended work in a step-by-step description in order for the EM

and the SE to understand the Contractors intentions. This will enable them to assist in devising any mitigation measures, which would minimize environmental impact during these tasks.

For each instance where it is requested that the Contractor submit a Method Statement to the satisfaction of the SE and EM, the format should clearly indicate the following:

- What - a brief description of the work to be undertaken;
- How - a detailed description of the process of work, methods and materials;
- Where - a description/sketch map of the locality of work (if applicable); and
- When - the sequencing of actions with due commencement dates and completion date estimates.
- Who – The person responsible for undertaking the works described in the Method Statement;
- Why – a description of why the activity is required.

All Method Statements are to be to the satisfaction of the EM, SE and, where practical and deemed necessary, should be endorsed as being acceptable by the ECO.

A list of some of the Method Statements that the Contractor may need to submit during the course of the construction contract has been provided in Section 4, along with an indication of those which the EM may require the Contractor to provide prior to the start of works on site (see Appendix 2 for a Method Statement Template).

2.8.4. DIARY ENTRIES

The EM will maintain a site diary that relates to environmental issues as they occur on site for record keeping purposes. Comments from this diary will form part of reports presented at site meetings during the construction phase.

2.8.5. SITE MEMO ENTRIES

Site memo's, stipulating recommended actions required to improve compliance with the construction phase of the EMPr by the contractor, will be issued by the EM to the SE, who in turn will ensure that the Contractor is informed of the said instruction.

Comments made by the EM in the Site Memo book are advisory and all Site Instructions required may only be issued by the SE. Site Memo's will also be used for the issuing of stop work orders for the purposes of immediately halting any particular activity(ies) of the Contractor deemed to pose immediate and serious risk of unnecessary damage to the environment.

2.9. LEGISLATIVE FRAMEWORK

The management and mitigation of the environmental impacts experienced during construction and operation is governed by environmental legislation. It is of utmost importance that this project is constructed in compliance with all relevant environmental legislation whether National, Provincial and / or Local.

The environmental legislative framework and components for South Africa can best be unpacked and summarised as follows:

- **The Constitution of South Africa (Act No 108 of 1996)**

  In accordance with the Constitution, the Government of South Africa has separate national, provincial and local levels that are mutually dependent and interconnected. All three areas of government have legislative and administrative functions and thus have responsibility for the management of the environment.

  The Bill of Rights (Chapter 2 of the Constitution) is a fundamental cornerstone of environmental law in South Africa and makes provisions for environmental issues. Section 24 of the Bill of Rights states that:

  "Everyone has the right -

  a) to an environment that is not harmful to their health or well-being; and

b) *to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that -*

   I. *prevent pollution and ecological degradation;*

   II. *promote conservation; and*

   III. *secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development".*

The requirements of this EMPr do not release the Project Company from the requirements of any legislation that may be applicable to the project.

A list of Legislation applicable to the Project (although not limited to those listed) has been provided below for guidance:

- The Minerals and Petroleum Resources Development Act, 2002, Act No. 28 of 2002 (MPRDA) Section 53 Surface Right requirements.
- National Environmental Management Act 107 of 1998 (NEMA)
  - » GN R. 982: National Environmental Management Act (107/1998): Environmental Impact Assessment Regulations, 2014 amended in 2017 (2014 EIA regulations)
  - » GN R. 983: Listing notice 1
  - » GN R. 983: Listing notice 3
- National Environmental Management: Air Quality Act 39 of 2004 (NEMAQA)
  - » GN 893: List of activities which result in atmospheric emissions
  - » GN R. 827: National dust control regulations
  - » GN R. 283: National atmospheric emissions reporting regulations
  - » GN R. 1210: National ambient air quality standards
  - » GN R. 351: Regulations regarding the phasing-out and management of ozone-depleting substances
- Atmospheric Pollution Prevention Act of 1965
  - » GN R. 1651: Regulations concerning the control of noxious or offensive gasses emitted by diesel-driven vehicles
- National Environmental Management: Waste Act 59 of 208 (NEMWA)
  - » GN R. 634: Waste classification and management regulations
  - » GN R. 921: Activities listed requiring a waste management licence (WML)
- Environmental Conservation Act of 1989 (ECA)
  - » GN R. 627: Waste tyre regulations
  - » GN R. 341: Regulations for the prohibition of the use, manufacturing, import and export of asbestos and asbestos containing materials
- National Water Act 36 of 1998 (NWA)
- Hazardous Substances Act 15 of 1973
- National Road traffic Act of 1996
  - » GN R. 225: National road traffic regulations
- National Health Act, 2003
- Fertilizers, farm feeds, agricultural remedies and stock remedies Act 36 of 1947
- Conservation of Agricultural Resources Act 43 of 1983 (CARA)
  - » GN R. 1048: Declared Weeds and Invader plants

- National Environmental Management: Biodiversity Act, 2002 (NEMBA)
- National Veld and Forest Fire Act 101 of 1998
- National Forest Act 84 of 1998
- National Heritage Resources Act 25 of 2000
- Occupational Health and Safety Act (Act 85 of 1993)
- Government Policies
- Waste Management policies
- National Environmental Health Policy
- SANS Standards as stipulated in mitigation tables below
- Hazardous substances management
- Provincial Legislation
- Northern Cape Planning and Development Act No. 7 of 1998

2.10. DISPUTE RESOLUTION

Any disputes or disagreements between role players on Project Site (with regard to environmental management) will firstly be referred to the SE during the construction phase, or to the EM or EM during the operational phase. If no resolution on the matter is possible then the matter will be referred to the DEA for clarification.

Where a dispute still persists, this shall be referred for arbitration to a panel of persons consists of: one specialist environmental consultant, one qualified engineer, one official of the DEA and one legal practitioner of no less than 4 years' experience in environmental issues, whose decision by simple majority will be final and binding on the parties. This arbitration will be informal ("the informal arbitration") and will be finalised within a period of 48 hours from the date of the declaration of a dispute.

The purpose being to ensure that disagreements are rapidly resolved, and thereby limit any prejudice to the contractor or the other parties to this agreement in the construction process or during the operation period. In the event of a deadlock in the aforesaid panel, the legal practitioner forming part of the panel will have a casting vote.

2.11. COMMUNITY/STAKEHOLDER RELATIONS

The Project Company should continue to engage with stakeholders throughout project construction and operation. Communication with local communities and other local stakeholders will be a key part of this engagement process and is one where the Project Company and the Contractor will need to work closely together during the construction period. Development of a Stakeholder Engagement Plan (SEP) is important to facilitate this communication.

The objectives of communication and liaison with local communities are the following:

- To provide residents in the vicinity of the development and other interested stakeholders, with regular information on the progress of work and its implications.
- To monitor implementation of mitigation measures and the impact of construction on communities via direct monitoring and feedback from those affected through a Complaints Register that is to be maintained by the Project Company in order to ensure that mitigation measures are implemented, and the mitigation objectives achieved.
- To manage any disputes between the Project Company, the Contractors and local people.
- .

3. PLANNING AND DESIGN EMPR

3.1. SCOPE

This section covers the mitigation measures and recommendations that may be considered in the planning and design stage of the PV Power Project.

3.2. Shared Auxiliary Infrastructure/ services

The Redstone PV Project will be constructed simultaneously to the Redstone CSP Project. Project resources will be shared where applicable for the duration of the planning and design stage. The following will be considered shared and will be managed as per the Redstone CSP Project (Refer to CSP EMPr - Appendix 3):-

- Appendix 3C: Alien Invasive Management Plan
- Appendix 3D: Plant Rescue and Protection Plan
- Appendix 3E: Rehabilitation Management Plan
- Appendix 3F: Grievance Mechanism
- Appendix 3G: Stormwater Management Plan
- Appendix 3H: Erosion Management Plan
- Appendix 3I: Soil Management Plan
- Appendix 3J: IFC Workers Accommodation Standards
- Appendix 3K: Traffic Management Plan
- Appendix 3L: Emergency Preparedness and Response Plan Appendix

3.3. PLANNING AND DESIGN EMPr REQUIREMENTS

3.3.1. OVERALL REQUIREMENTS

The Project Company is responsible for ensuring that the design of the PV Power Project responds to the identified environmental constraints and opportunities. For ensuring that pre-construction activities are undertaken in accordance with all relevant legislative requirements, and that adequate regard has been taken of any landowner and community concerns and that these are appropriately addressed through adequate design and planning (where appropriate). For ensuring that the best environmental options are selected for the linear components, including the power line alignment and internal access roads; and that the PV Power Project construction activities to be undertaken without significant disruption to other land uses and activities in the area. In order to meet this goal, the following objectives have been identified, together with necessary actions and monitoring requirements.

A. Objective: Ensure selection of best suited environmental option for the proposed Project and auxiliary infrastructure Final design to be based on the plans and surveys undertaken for the development footprint.	
Impact Management Outcome:	• The design meets the objectives and does not degrade the environment. • Design and layouts respond to the mitigation measures and recommendations in the BAR Report. • Minimal impact on the riparian areas.
Monitoring:	Review of the design by the Project Manager and the Environmental Manager prior to the commencement of construction.
Auditing:	N/A
Management Review:	N/A

ASPECT AFFECTED	POTENTIAL IMPACT[2] - SIZE AND SCALE OF DISTURBANCE[3]	ACTIVITIES	MITIGATION MEASURES [4] *(modify, remedy, control, or stop through (e.g. noise measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc.)* *E.g. Modify through alternative method.* *Control through noise control* *Control through management and monitoring* *Remedy through rehabilitation.*	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY[5]	COMPLIANCE WITH STANDARDS [6]
Final layout	Potential impact on identified sensitive areas. Scale: Entire PV development footprint	**Positioning of all the facility components** • PV Facility • Access roads • Power lines	Control through avoidance: 1. Plan and conduct pre-construction activities in an environmentally acceptable manner. 2. Obtain any additional environmental permits required. 3. Consider and incorporate design level mitigation measures recommended by the specialists (Refer to BAR and Specialist reports as appended). 4. Utilise common areas of Redstone CSP Project, i.e. laydown areas/ assembly areas, security, administration area, substation, temporary man camp, water related infrastructure (associated water storage tank/s) and other related infrastructure to minimize environmental impacts. 5. Consult a lighting engineer in the planning and placement of light fixtures for the PV Power Plant. 6. The holder of an environmental authorisation has the responsibility to notify the competent authority of any alienation, transfer and, change of ownership rights in the property on which the activity is to take place. 7. Fourteen (14) days written notice must be given to the Department that the activity will commence. The notification must include a date on which the activity will commence as well as the reference number. 8. ECO to be appointed prior to the commencement of any authorised activities. Once appointed the name and	1. Pre-construction- Developer/Owner/ EPC Contractor	BAR and EMPr

[2] e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc.

[3] Volumes, tonnages and hectares or m²

[4]describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants

[5] Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either: Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.

[6] A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities

ASPECT AFFECTED	POTENTIAL IMPACT[2] - SIZE AND SCALE OF DISTURBANCE[3]	ACTIVITIES	MITIGATION MEASURES [4] *(modify, remedy, control, or stop through (e.g. noise measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc.)* *E.g. Modify through alternative method.* *Control through noise control* *Control through management and monitoring* *Remedy through rehabilitation.*	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY[5]	COMPLIANCE WITH STANDARDS [6]
			contact details of the ECO must be submitted to the Director: Compliance Monitoring at the DEA.		

4. PRE-CONSTRUCTION EMPR

4.1. SCOPE

This section covers the mitigation measures and recommendations that may be considered in the preconstruction stage of the PV Power Project.

4.2. SHARED AUXILIARY INFRASTRUCTURE/ SERVICES

The Redstone PV Project will be constructed simultaneously to the Redstone CSP Project. Project resources and infrastructure will be shared where applicable for the duration of the pre-construction stage. The following will be considered shared and will be pre-construction activities will be managed as per the method statements of the Redstone CSP Project:-

- Site camp establishment
- hazardous substances/dangerous goods management
- cement and concrete batching
- socio economic
    - Supply of equipment and services (Identify and explore opportunities to procure goods and services to maintain the PV Power Project during the construction and operation phases above and beyond those that would be done as part of Redstone CSP Project)
    - Develop and implement a material recovery strategy to optimise the use of valuable metallic and, where applicable, non-metallic materials comprising various components of the PV Power Project and Redstone CSP Project

4.3. PRE-CONSTRUCTION EMPr REQUIREMENTS

4.3.1. PERMIT REQUIREMENTS

Activities undertaken during site preparation, construction and operation shall require additional permits. The Project Company is responsible for ensuring that they hold the necessary permits in order to comply with national and local regulations. i.e. Civil Aviation Authority; Water Use License; NEMBA Flora Permit (NC DENC); NEMBA Flora Permit (DAFF); SAHRA; Rezoning; SALA; MPRDA.

4.3.2. MONITORING AND AUDITING

Monitoring and Auditing will be done as per the Redstone CSP Facility as infrastructure, roles and responsibilities will be shared between the two power generating facilities.

4.3.3. METHOD STATEMENTS

In order to effectively protect the receiving environmental aspect, the Contractor shall not commence with specified activities, until the Method Statement has been approved and shall, except in the case of emergency activities, allow a period of one week for approval by the SE. Such approval shall not unreasonably be withheld.

The SE and EO may request a Method Statement for any activity they believe may impact on the environment. The SE in consultation with the EO may also require changes to a Method Statement if the proposal does not adequately address the environmental impact created, or, if in the reasonable opinion of the SE, the proposal may result in, or carry a greater than reasonable risk of damage to the environment in excess of that permitted.

Approved Method Statements shall be readily available on the site and shall be communicated to all relevant personnel. The Contractor shall carry out the Works in accordance with the approved Method Statement. Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the Contract.

The following services will be shared with the Redstone CSP Project, as impacts will be reflective of the Redstone CSP Project. Method Statements shall be provided by the Contractor and submitted to the SE and EM at least seven (7) working days before site establishment:

- **VEGETATION CLEARING & MANAGEMENT**

Method of vegetation clearing during site establishment and disposal procedure for cleared material as well as the monitoring of alien invasive species and the removal there of.

- **TOP SOIL MANAGEMENT**

  Method of clearing topsoil and location of topsoil stockpiles including erosion protection.

- **WATER MANAGEMENT**

  Method Statement to be provided in terms of treatment and handling of potable and possible grey water, stormwater management practices, erosion control. Working around watercourses will also be included under this Method Statement category.

- **REHABILITATION**

  Method Statement to be provided by the contractor in terms of rehabilitation measures proposed to remedy the impacts of construction and operational environmental damage and/or impacts. This Method Statement is to align with the guidance provided for in the Rehabilitation Management Plan (Appendix 3E).

- **WASTE AND POLLUTION MANAGEMENT**

  Method Statement to be provided by the contractor in terms of prevention, containment and rehabilitation measures to guard against environmental damage caused by waste or possible pollution sources on site and as per the identified water and drainage systems that occur near the site.

- **ENVIRONMENTAL EMERGENCY RESPONSES**

  Method Statement to be provided by the contractor in terms of fire prevention, incident and accident reporting protocol.

A. **Objective: <u>To ensure effective communication with surrounding landowners and site personnel during construction and operation</u>** On-going communication through planning stage with affected and surrounding landowners is important to maintain during the construction and operational phases of the PV Power Project. Adequate planning needs to be undertaken in this regard. Any issues and concerns raised should be captured in a complaints register and addressed as far as possible in as short a timeframe as possible. In summary, the following pre-construction policies are required to be incorporated in the PV Power Project: • Community Health and Safety • Grievance Mechanism • Method Statements • Stakeholder Communication • Traffic Management • Fire Management	
Impact Management Outcome:	Impacts on affected and surrounding landowners and land uses
Monitoring:	• An incident reporting system should be used to record non-conformances to the EMPr. • Complaints register.
Auditing:	N/A
Management Review:	N/A

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
Stakeholder communication	Impacts on affected landowners and land uses surrounding the PV facility.	All activities associate with all components under construction and operation of the PV Power Project	Control through Management: 1. Implement the grievance mechanism procedure for the public (following the guidelines of the grievance mechanism in Appendix 3F) to be implemented during both the construction and operational phases of the facility. 2. Implement a grievance mechanism for the construction, operational and decommissioning phases of the Project for all employees, contractors, subcontractors and site personnel, in line with the South African Labour Law. 3. Liaison with landowners and neighbouring landowners is to be undertaken prior to the commencement of construction should they be required to plan accordingly. 4. All minor and major environmental incidences must be communicated to the ECO, including the cause, extent, future mitigation measures and time frame for which the incident will be resolved. 5. The Project Company should develop a grievance procedure to ensure fair and prompt resolution of problems arising from the project. The grievance procedure should be underpinned by following the principles and commitments (Appendix 3F) Implement a transparent grievance procedure and disseminate key information to directly impacted stakeholders. Seek to resolve all grievances timeously. Maintain full written records of each grievance case and the associated process of resolution and outcome for transparent, external reporting. The responsibility for resolution of grievances will lie with the Project Company and its contractors.	1. Developer/Owner/ EPC Contractor / O&M Contractor - Pre-construction / Pre-operation.	BAR and EMPr
Avifauna	Impacts on avifauna on project footprint	All activities associate with all components	1.Prior to commencement of construction commencing, ECO must be trained by an avifaunal specialist to identify the potential Red Data species as well as the signs that	2. ECO; Avifauna specialist	EMPr; Avifauna report

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
	surrounding areas.	under construction and operation of the PV Power Project	indicate possible breeding by these species. The ECO must then, during audits/site visits, make a concerted effort to look out for such breeding activities of Red Data species, and such efforts may include the training of construction staff (e.g. in Toolbox talks) to identify Red Data species, followed by regular questioning of staff as to the regular whereabouts on site of these species. 2.If any of the Red Data species are confirmed to be breeding (e.g. if a nest site is found), construction activities within 500 m of the breeding site must cease, and an avifaunal specialist is to be contacted immediately for further assessment of the situation and instruction on how to proceed.		

5. CONSTRUCTION ENVIRONMENTAL SPECIFICATION

5.1 SCOPE

This specification covers the requirements for controlling the impact on the environment of all construction activities for the PV Power Project. All construction activities will be undertaken in line with this specification as well as any relevant environmental legislation and in so doing shall be undertaken in such a manner as to minimize impacts on the natural and social environment.

5.2 SHARED AUXILIARY INFRASTRUCTURE/ SERVICES

The Redstone PV Project will be constructed simultaneously to the Redstone CSP Project. Project resources and infrastructure will be shared where applicable for the duration of the construction stage. The construction phase will involve the construction and assembly of the PV arrays, the interconnection cabling and electrical systems, and internal roads required for the operation of the plant. In this regard, the activities and/or facilities relevant to the construction phase as listed below will be shared between the PV Power Project and the Redstone CSP Project.

Auxiliary Infrastructure/ services	Shared CSP service
Bulk material laydown and consumable stores	✓
Refueling and maintenance	✓
Power supply and use	✓
Water supply and use	✓
Construction camp	✓
Staff facilities	✓
Management and administration	✓
Waste management (General, solid, liquid, inert and hazardous waste)	✓
Storm water management Plan	✓
Management of construction vehicles	✓
Concrete and cement batching	✓
Appropriate handling and management of hazardous substances, dangerous goods	✓

The construction period for the PV Power Project will take approximately 2 – 6 months.

5.3 MONITORING AND AUDITING

Monitoring and Auditing will be done as per the Redstone CSP Facility as infrastructure, roles and responsibilities will be shared between the two power generating facilities.

5.4 SITE ESTABLISHMENT

A. **Objective: <u>Minimise impacts related to site establishment</u>**

SITE DEMARCATION

The Contractor shall restrict all his activities, materials, equipment and personnel to within the area specified, and shall restrict his activities to only those areas that are necessary to undertake the works.

The Contractor shall erect and maintain permanent and/ or temporary fences of the type and in the locations directed by the SE. Such fences shall, if so specified, be erected before undertaking designated activities. The construction camp, material stores and lay-down areas should be screened and sited as far as possible from the local roads.

ABLUTION FACILITIES

Latrine and ablution facilities and first-aid services shall comply with the regulations of the local authority concerned and shall be maintained in a clean and sanitary condition to the satisfaction of the SE.

The Contractor shall provide suitable sanitary arrangements at the Contractor's Camp and approved points around the designated work area to allow easy access to all employees on site.

No staff is permitted to commence with work on a site without suitable toilet facilities available for them. Sanitary

facilities shall be located within 100 m from any point of work, but not closer than 50 m to any water body. One chemical toilet is to be provided on site for every 15-contract personnel within 100m to each earth works placed. Ablution and sanitation facilities should not be located within a 100m from a 1:100 year flood line. These toilets must have doors and locks and shall be secured to prevent them blowing over. Toilet facilities will be made available to both men and women, separately, with toilet paper and hand sanitiser provided or water and soap[7]. The Contractor shall keep the toilets in a clean, neat and hygienic condition. If the Contractor fails to provide and/or maintain all site sanitation facilities in a clean and hygienic condition, the SE may order the Contractor to suspend any or all work on the site until these requirements are met. No payment shall be made for any delays or disruption of the Works caused thereby nor shall extensions of time be granted for such delays. Toilets are to be emptied prior to builders' holidays and serviced once a week, to ensure that no odors originate from this source and to ensure hygienic conditions for employees. The contractor shall ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are removed from site. Discharge of waste from toilets into the environment and burial of waste is strictly prohibited.	
Impact Management Outcome:	• Site is secure and there is no unauthorised entry. • No injuries recorded. • Appropriate and adequate sanitation facilities provided at construction site.
Monitoring:	• An incident reporting system will be used to record non-conformances to the EMPr. • ECO to monitor all construction areas on a continuous basis until all construction is completed. Non-conformances will be immediately reported to the site manager.
Auditing:	Monthly
Management Review:	Every 2 months

[7] All sanitation to be provided in accordance with the Occupational Health and Safety Act.

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
Site establishment and Hydrology management	Hazards to landowners and public. Damage to indigenous natural vegetation, due largely to ignorance of where such areas are located. Loss of threatened plant species and protected tree species. Impact on heritage sites for Development footprint and surrounding areas.	Open excavations (foundations and cable trenches). Movement of construction vehicles in the area and on-site.	Control through avoidance: 1. Secure site, working areas and excavations in an appropriate manner, as agreed with the Site Manager and ECO. 2. Minimize vegetation clearance. The project infrastructure footprint and associated area of disturbance should be minimised as far as practically possible with adequate spacing between panels to encourage shrubland growth. 3. Compile a method statement specific to vegetation clearance. 4. The clearing of vegetation and disturbance of soils should be done considering the potential for subsequent erosion. 5. Site rehabilitation should aim to restore surface drainage patterns, natural soil and vegetation as far as is feasible. 6. An erosion control management plan should be utilised to prevent erosion (Refer to Appendix 3H). This may include erosion control measures such as silt fences (for areas of works) and gravel strips at the impact zone where water falls from the solar panels onto the soil surface (due to deterioration in natural shrubland because of poor maintenance or lack of solar radiation) The development of the PV Power Project should be done considering the potential for erosion as part of the overall storm water management of the site which will also facilitate slowing of runoff or settling of sediment. This may include 'soft' engineering solutions such as vegetated buffer strips or swales alongside service roads, underneath solar panels or downslope of a range of panels. 'Hard' engineering solutions silt traps can be implemented if 'soft' solutions are found to be inadequate. Any vegetated buffer strips or swales will need to be maintained with a healthy shubland cover that can effectively intercept sediment suspended in	Duration of contract- CER / PM	Establish SABS 089: 1999

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			runoff. Flow points from non-perennial rivers to the east of the site should be identified/verified to enable an assessment of the expected catchment area and associated flow rates/volumes. Mitigation of surface water flooding can consequently be incorporated into the storm water management plan of the site with water routed around sensitive infrastructure. The design of any diversions should use the 1:50 year storm event at minimum. 7. A minimum exclusion zone of 32m should be used around all 1:50,000 topographical map watercourses specifically in association with the non-perennial watercourse which intersects the site. A larger buffer of 100m around all watercourses is the preferred exclusion zone as it accounts for more uncertainty with regards to any possible flooding. It should be noted, however, that the significance of the intersecting non-perennial watercourse is uncertain (based upon this desktop study) and clarification as to the nature of this watercourse is possible using a more detailed investigation during a high rainfall period (e.g. March). 8. Fluvial flood risk to the western boundary of Option A should be considered beyond the surface water flooding with additional offset potentially necessary as determined by a suitability qualified hydrologist or engineer prior to construction. 9. Minimum buffer area of 32m should be maintained between the proposed PV Power Plant development area and the Groenwater Spruit riparian zone. If possible, this buffer zone should be increased further. The buffer zone must be maintained as a fully vegetated buffer strip between the development and the riparian habitat. No intrusion into the buffer should be allowed.		

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			10. A construction stormwater management plan must be developed and implemented prior to the commencement of large scale vegetation clearing activities or construction activities and be maintained until the end of the construction phase. Such a plan should aim to minimise the transport of sediment off site as well as prevent the discharge of high velocity flows into downslope wetlands. Sediment traps and sediment barriers should be installed where necessary, and discharge points should be protected against erosion and incorporate energy dissipaters. 11. To minimise the impact of increased runoff and sediment transport into adjacent watercourses, vegetation clearing and soil stripping should be concentrated in the dry season. 12. Erosion within the construction site must be minimised through the following: o Limiting the area of disturbance and vegetation clearing to as small an area as possible; o Where possible, undertaking construction during the dry season; o Phasing vegetation clearing activities and limiting the time that any one area of bare soil is exposed to erosion; o Control of stormwater flowing onto and through the site. Where required, stormwater from upslope should be diverted around the construction site; o Prompt stabilisation and re-vegetation of soils after disturbance and construction activities in an area are complete; and o Protection of slopes. Where steeper slopes occur, these should be stabilised using		

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			geotextiles or any other suitable product designed for the purpose. 13. Sediment transport off the site must be minimised through the following: o Establishing perimeter sediment controls. This can be achieved through the installation of sediment fences along downslope verges of the construction site. Where channelled or concentrated flow occurs, reinforced sediment fences or other sediment barriers such as sediment basins should be used (refer to US EPA guidelines on Stormwater Pollution Prevention); o Discharge of stormwater from the construction site into adjacent grassland rather than directly into wetland habitat. Discharged flows must be slow and diffuse; and o Regular inspection and maintenance of sediment controls 14. Establish the necessary ablution facilities with chemical toilets and provide adequate sanitation facilities and ablutions for workers (1 toilet per every 30 workers for each sex) at appropriate locations around the Project Site. 15. Ablution or sanitation facilities should not be located within 100 m from a 1:100 year flood line including water courses, wetlands. 16. Supply adequate weather and vermin proof waste collection bins and skips (covered at minimum with secured netting or shadecloth) at site where construction is being undertaken. Separate bins should be provided for general and hazardous waste. As far as possible, provision should be made for separation of waste for recycling.		

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			17. Solid waste: All work sites must be kept free of waste. No solid waste may be burned or buried on site or disposed of by any other method on site or within quarries or borrows pits. 18. Liquid waste: No liquid waste, including grey water, may be discharged into any water body or drainage line. Clearly label all the containers storing hazardous substances. 19.		

a) Objective: Minimisation of development footprint and disturbance

In order to minimise impacts on flora, fauna, and ecological processes, the development footprint should be limited to the final laydown to avoid areas identified as sensitive (Refer to Sensitivity map **Figure 2**). Auxiliary infrastructure will be shared with the Redstone CSP Project where possible, i.e. laydown areas, administrative buildings, man camp, etc.

SITE CLEARANCE

VEGETATION CLEARANCE

Vegetation clearance should be phased as required to work in certain areas, rather than clearing of the entire site initially. If this is not practical and the entire site is cleared at the start of the contract, it is to be stabilized immediately to control dust. Wherever possible, vegetation shall be trimmed rather than cleared.

Cleared vegetative material is not to be dumped anywhere other than an approved waste disposal site. Wherever possible and where the material is suitable, the material should be chipped for later use as mulch in landscaped areas or for stabilization purposes or it should be dumped at a green waste recycling depot for compost production.

Invasive alien plant species, which are removed from the site, are not to be chipped for mulch if they are in a seed-bearing state (Appendix 3C). Such material is to be disposed of at a approved suitable waste disposal site. Wherever possible, suitable larger stumps should be made available to the local community as fire wood.

Plant material removed from the site is not to be burnt for disposal on site unless a burning permit has been obtained from the local authority.

Removal of vegetation should be kept to a minimum, and cleared areas must be re-vegetated after clean-up. A detailed planting plan should be developed, in consultation with a landscaper and ecologist.

An Alien Invasive Species Management (Appendix 3 C)has been included to ensure that the site is cleared of alien plants (as listed under the Conservation of Agricultural Resources (CARA) Act 43 of 1983 - as amended/updated and the National Environmental Management Biodiversity Act Regulations GN.R 598, 2014 on Alien invasive Species Categories) and kept free from alien plants for the duration of the construction phase.

TOPSOIL MANAGEMENT

Topsoil shall be removed from all areas cleared of vegetation and retained for future landscaping use, where feasible. All topsoil, and specifically any topsoil from areas which are likely to contain bulbs, must be stripped and stockpiled for re-use in landscaped areas.

Topsoil shall be stored in areas demarcated by the EO and SE and in piles not higher than 2 m (or in accordance with the engineering specification), and may not be removed from site, or used for any purpose other than in the final landscaping of the site. The stockpiles shall not be compacted, disturbed or used for storage (albeit temporary) of any materials or equipment, and shall be domed at the top to promote runoff and kept free of contaminants. The period between the stockpiling of topsoil and its utilization shall be as short as possible, and ideally the topsoil should be transferred to its intended site of use immediately following site clearance and stockpiling. This would also avoid double handling.

Stockpiles that are to be stored for less than three (3) months should be covered with shade-cloth or Geotech fabrics or similarly suitable material to prevent erosion, and kept moderately moist in order to maintain the vitality of the soil. If stockpiles are to be stored for more than three (3) months a protective vegetation layer must be established to cover topsoil stockpiles in order to protect them against erosion and desiccation. The stockpile must be kept moist in order to maintain the vitality of the vegetation. Vegetation may not consist of weeds, but must comprise grass or ground covers[8].

SOIL DEGRADATION AND EROSION

The soil on site may be impacted in terms of Soil degradation including erosion (by wind and water) and subsequent deposition elsewhere is of a concern across the entire site which is underlain by fine grained soil which can be mobilised when disturbed, even on relatively low slope gradients (accelerated erosion). Uncontrolled run-off relating to construction activity (excessive wetting, uncontrolled discharge, etc.) will also lead to accelerated erosion and possible sedimentation of drainage lines. Degradation of the natural soil profile due to excavation, stockpiling, compaction, pollution and other construction activities will affect soil

[8] Indigenous grasses as outlined in Munich and Rutherford, Vegetation of Southern Africa 2006, for the Project Site.

forming processes and associated ecosystems.

FLORA, FAUNA AND AVIFAUNA

Site preparation and initial clearing activities must be supervised by the ECO to ensure the correct demarcation of no-go areas, facilitate environmental induction with construction staff. Supervision of any flora relocation and faunal rescue activities that may need to take place during the site clearing is required (i.e. during site establishment, and excavation of foundations). Overall there do not appear to be any highly significant issues regarding mammals and avifauna for development of the site. In general the major impact associated with the development of the site for mammals and avifauna would be a small amount of habitat loss and potentially some disruption of the broad-scale connectivity of the landscape.

HERITAGE

The main cause of impacts to archaeological sites is physical disturbance of the material itself and its context. The heritage and scientific potential of an archaeological site is highly dependent on its geological and spatial context. This means that even though, for example a deep excavation may expose archaeological artefacts, the artefacts are relatively meaningless once removed from the area in which they were found. Large-scale excavations for foundations will damage archaeological sites, as will road construction activities.

Archaeological or other heritage materials occurring in the path of any surface or sub-surface disturbances associated with any aspect of the development are highly likely to be subject to destruction, damage, excavation, alteration, or removal.

The developer must ensure that any heritage objects found on site are treated appropriately and in accordance with the relevant legislation.

VISUAL

The PV Power Project will be constructed in parallel with the Redstone CSP Project. During the construction period, there will be an increase in heavy vehicles utilising the roads to the construction sites for both the CSP and PV facilities that may cause, at the very least, a visual nuisance to other road users and landowners in the area in close proximity. Within the region, dust as a result of construction activities may be visible, especially in this receiving environment, and as such will result in visual impact during construction.

Secondary visual impacts associated with the construction phase, such as the sight of construction vehicles, dust and construction litter must be managed to reduce visual impacts. The use of dust-suppression techniques on the access roads (where required), timely removal of rubble and litter, and the erection of temporary screening will assist in doing this.

WASTE MANAGEMENT

The construction of the PV Power Project will involve the generation of various wastes. In order to manage the wastes effectively, guidelines for the assessment, classification, and management of wastes, along with industry principles for minimising construction wastes must be implemented. The main wastes expected to be generated during the construction phase from the packaging of PV components, and inert waste (rock and soil).

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
Site clearance	Impacts on natural vegetation. Impacts on soil. Loss of topsoil.	» Site preparation and earthworks. » Trenching activities. » Excavation of foundations. » Construction of site access road. » Site preparation (e.g. compaction). » Foundations or plant equipment installation. » Stockpiling of topsoil, subsoil and spoil material.	Control through avoidance and management: 1. Areas to be cleared must be clearly marked on-site to eliminate the potential for unnecessary clearing. 2. The extent of clearing and disturbance to the native vegetation must be kept to a minimum so that impact on flora and fauna is restricted. 3. Construction activities must be restricted to demarcated areas so that impact on flora and fauna is restricted. 4. All fill material must be sourced from a commercial off-site suitable/permitted source, quarry or borrow pit. Where possible, material from foundation excavations must be used as fill on-site. 5. Topsoil must be stockpiled and managed in terms of the stockpile management plan. 6. Excavated topsoil must be stockpiled in designated areas separate from base material and covered until replaced during rehabilitation. As far as possible, topsoil must not be stored for longer than 3 months. 7. Topsoil must not be stripped or stockpiled when it is raining or when the soil is wet as compaction will occur. 8. The maximum topsoil stockpile height must not exceed 2m in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen. 9. Topsoil recovered from site, must not be used for any construction related activities, including that of bedding for underground cabling. 10. Use of herbicides and handpicking/ slashing to control alien plants in development footprint. Disposal of alien plants must be done in a manner that cannot propagate. No alien plant should be allowed develop to a point of producing seed.	Site establishment & duration of contract- CER	Conservation of Agricultural Resources (CARA) Act 43 of 1983 - as amended/updated National Environmental Management Biodiversity Act Regulations GN.R 598, 2014 on Alien invasive Species Categories

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
Loss of indigenous vegetation	Loss of indigenous natural vegetation due to construction activities, or poor behaviour on the part of the construction team- development footprint and surrounds	» Vegetation clearing. » Construction of access roads. » Construction/placement of water storage/treatment tank/s. » Chemical contamination of the soil by vehicles and machinery. » Operation of construction camps. » Storage of materials required for construction .	Control through avoidance and management: 1. Areas to be cleared must be clearly marked in the field to eliminate unnecessary clearing. 2. Limit unnecessary impacts on surrounding natural vegetation, e.g. driving around in the veld, use access roads only. 3. Driving is only allowed on access roads and within designated areas in the development footprint. If driving is required outside of the designated areas, then approval from the ECO must first be granted before the activity commences. 4. Ensure all permits from DENC are valid. If new vegetation has been identified for removal, then permits need to be updated and re-submitted. » Search and Rescue (S&R) (refer to Appendix 3D: Plant Rescue and Protection Plan) of all protected plants that will be affected by the development, especially species occurring in long term and permanent, hard surface development footprints (i.e. all buildings, new roads and tracks, lay down areas, and PV panel, substation, battery storage area positions) must take place. » All development footprints must be surveyed and pegged out as soon as possible, after which a local horticulturist or community members with Search and Rescue experience should be appointed to undertake the S&R. 5. All rescued species should be transplanted immediately or bagged (or succulents left to first air-dry before planting) and kept in the horticulturist's or a designated on-site nursery, and should be returned to site or land portion once all construction is completed and rehabilitation of disturbed areas is required.	Construction – CER	In accordance with Mucina & Rutherford 2006.

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			6. Replanting should occur in spring to early summer once sufficient rains have fallen, in order to facilitate establishment. 7. Should transplantation not be possible, the location of the plant species should be clearly demarcated. 8. The site rehabilitation programme must be implemented 9. No one other than the ECO or personnel authorised by the ECO may disturb flora or fauna outside of the demarcated construction area/s.		
Soil degradation and erosion	Soil and rock degradation. Soil erosion. Increased deposition of soil into drainage systems. Increased run-off over the site. Contaminated run-off from the site.	» Removal of vegetation, excavation, stockpiling, compaction, and pollution of soil. » Rainfall - water erosion of disturbed areas. » Wind erosion of disturbed areas. » Concentrated discharge of water from construction activity.	Control through management and monitoring 1. Identify disturbance areas and restrict construction activity to these areas. 2. Rehabilitate disturbance areas as soon as practical when construction in an area is complete. 3. Newly rehabilitated areas must be adequately demarcated until vegetation is established. 4. Minimise removal of vegetation which adds stability to soil. 5. Soil conservation: Stockpile topsoil for re-use in rehabilitation phase, protect stockpile from erosion 6. Erosion control measures: Run-off attenuation on slopes (sand bags, logs), silt fences, stormwater catch-pits, shade nets, rip-rap, brush packing or temporary mulching over denuded area as required. 7. Top soil recovered from site or which stockpiled may not be used for any construction related activities. 8. Control depth of excavations and stability of cut faces/sidewalls.	Before and during construction: CER	BAR and EMPr
Avifauna	Vegetation clearance and associated impacts on faunal habitats.	» Site preparation and earthworks. » Construction-related traffic. » Foundations or plant	Control through management and monitoring 1. The extent of clearing and disturbance to the native vegetation must be kept to a minimum so that impact on avifauna and their habitats are restricted. 2. Bird friendly structures must be used to prevent perching,	Site establishment & duration of contract- CER	BAR, EMPr and specialist recommendation

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
	Traffic to and from site. Loss of avifauna due to interactions with humans and site infrastructure-development footprint	equipment installation. » Mobile construction equipment. » Power lines and associated electrical infrastructure » Man Camp	nesting and flashovers from streamers, resulting in avifaunal injuries/ deaths. 3. PV panel support structures must not encourage avifauna to nest. 4. Implement a construction phase avifauna monitoring programme to maintain a record of bird fatalities 5. The EPC contractor must ensure that all subcontractors report avifaunal incidents to the ECO/ CER immediately. 6. All contractors are to adhere to the Construction Environmental Management Plan (CEMP) and should apply good environmental practice during construction. 7. If any of the Red Data species are confirmed to be breeding (e.g. if a nest site is found), construction activities within 500 m of the breeding site must cease, and an avifaunal specialist is to be contacted immediately for further assessment of the situation and instruction on how to proceed. 8. A faunal register must be implemented and maintained during construction by the ECO and EO, which must contain the following: » Record of all avifaunal injuries and fatalities; » Time, location and GPS co-ordinates of such incidence; » Common and species name of impacted fauna; » Possible cause of incident; » Conservation status; and » Photographic evidence.		
Fauna & Flora	Loss of faunal habitats. Loss of flora. Traffic to and from site. Loss of fauna	» Site preparation and earthworks. » Construction-related traffic. » Foundations or plant equipment installation.	Control through management and monitoring: 1. Areas to be cleared must be clearly marked in the field to eliminate unnecessary clearing/disturbance of faunal habitats. 2. The extent of clearing and disturbance to the native vegetation must be kept to a minimum so that impact on	Duration of contract/ Duration of Construction: CER	BAR, EMPr and specialist recommendation

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
	due to interactions with humans and site infrastructure- Development footprint	» Mobile construction equipment. » Power lines and associated electrical infrastructure » Vegetation clearance	fauna and their habitats are restricted. 3. Implement a faunal removal plan/ rescue plan with designated personnel and contact numbers. 4. Ensure the absence of larger animals through frequent patrols, particularly prior to land clearance. 5. Faunal removal plan must be approved by the ECO. 6. Restrict losses of natural habitat to footprints, avoid peripheral or unnecessary losses of natural habitat; ensure proper rehabilitation of areas outside development footprints (where accidental habitat degradation occurred). 7. Competent persons must be responsible for removal of fauna. 8. Faunal injury/ fatality register must be kept on site to record all faunal related incidents. 9. Ensure the competent persons have the relevant capture, release and transportation permits issued by the DENC before site clearance and construction commences. 10. Identify farm/ land portion where fauna will be released and ensure that prior consent from land owner has been obtained. 11. Ensure animal capture/ removal/ transportation equipment is available on site, such as snake hooks, tongs, bags, eye shield, etc. 12. Contract services of a veterinarian or ranger with access to tranquilisers for larger fauna. 13. Ensure contact numbers of responsible persons are displayed around site. 14. Ensure signs are placed around the site indicating applicable protected and dangerous faunal species. 15. Animals that cannot flee from the affected areas by themselves (e.g. tortoises, amphibians, small mammals)		

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			must be removed from the affected areas before the start of site clearing/construction and relocated to safe areas. 16. Traffic calming or extensive use of speed limit/ warning signs must be installed along access roads to prevent/ reduce faunal mortalities. 17. Vehicle movements must be restricted to designated roadways. Movements outside of designated roadways and proposals for the construction of informal access roads must be done with the agreement of the ECO. 18. Worker/ contractor awareness programmes, ensuring minimal conflict situation. 19. Control of human movement in adjacent natural habitat, frequent patrols, biological monitoring programmes, animal control (vervet monkeys, feral cats, rats, baboons, dogs, etc) 20. Implement generic monitoring programme and mitigation measures that are aimed at identifying and preventing the uncontrolled spread of impacts into adjacent areas of natural habitat 21. A faunal register must be implemented and maintained during construction by the ECO and EO, which must contain the following: » Record of all faunal and avifaunal injuries and fatalities; » Time, location and GPS co-ordinates of such incidence; » Common and species name of impacted fauna; » Possible cause of incident; » Conservation status; and » Photographic evidence. 22. The EPC contractor must ensure that all subcontractors report faunal and avifaunal incidents to the ECO/ CER immediately		

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
Heritage	Heritage objects or artefacts found on site are inappropriately managed or destroyed: development footprint and surrounds	» Site preparation and earthworks » Foundations or plant equipment installation » Mobile construction equipment movement on site » Construction of power line towers	Control through management and monitoring: 1. Familiarise all staff and contractors with procedures for dealing with chance finds of heritage objects/sites i.e. stone tool scatters, artefacts or bone and fossil remains. 2. Project employees and any contract staff will maintain, at all times, a high level of awareness of the possibility of discovering heritage sites. 3. If a heritage object is found, work in that area must be stopped immediately, find cordoned off, and appropriate specialists brought in to assess to site, notify the administering authority of the item/site, and undertake due/required processes. 4. Apply for sampling permits from SAHRA for work on any archaeological sites identified as needing intervention. 5. If any graves are located on the development footprint, they should ideally be preserved in-situ or alternatively relocated according to existing legislation. 6. If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit must be alerted. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit, must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 heritage rescue operation may be required subject to permits issued by SAHRA.	Duration of contract: EPC Contractor in consultation with Specialist:	SAHRA guidelines: Archaeological and Palaeontological Components of Impact Assessment Reports Heritage Resources Act, Act No. 25, 1999 BAR, EMPr and Heritage Impact Assessment

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
Visual	Visual impact of general construction activities and construction, the potential scarring of the landscape due to vegetation clearing: Development footprint and surrounds	Viewing of construction related activities by observers on or in close proximity to the site.	Control through management and monitoring: 1. Keep vegetation removal to a minimum where possible. Ensure, wherever possible, all existing vegetation is retained and incorporated into the site rehabilitation. 2. Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads. 3. Ensure good housekeeping, i.e. site is neat and tidy throughout construction phase. Ensure that rubble, litter, and disused construction materials are managed and removed regularly. 4. Ensure that all infrastructure and the site and general surrounds are maintained in a neat manner. 5. Reduce and control construction dust using approved dust suppression techniques. 6. Only the footprint and a small 'construction buffer zone' around the proposed activities should be exposed. In all other areas, the existing vegetation should be retained and access prohibited during the construction phase. 7. Access roads will require an effective dust suppression management programme, such as regular wetting and / or the use of non-polluting chemical stabilisation that will retain moisture in the road surface. 8. As far as possible, restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting. 9. Install light fixtures that provide precisely directed illumination to reduce light "spillage" beyond the immediate surrounds of the Project Site. 10. Avoid high pole top security lighting along the periphery of the site, where possible, unless a security risk is posed and consider the use of lights that are activated on movement at illegal entry to the Project Site.	Duration of construction: CER	

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			11. Rehabilitate all disturbed areas, construction areas, roads, and servitudes to acceptable visual standards.		
Waste Management	Inefficient use of resources resulting in excessive waste generation Litter or contamination of the site or water through poor waste management practices Increase in vermin Soil pollution Groundwater and surface water pollution: development footprint and surrounds	» Packaging » Other construction wastes » Hydrocarbon and chemical use, handling and storage » Spoil material from excavation, earthworks and site preparation » Septic tanks and portable toilets	1. Construction method and materials should be carefully considered in view of the waste hierarchy, i.e. reduction, re-use, and recycling opportunities. 2. Where practically possible, construction and general wastes on-site must be reused or recycled. Bins and skips must be available on-site for collection, separation, and storage of waste streams (such as wood, metals, general refuse etc.). 3. Disposal of waste must be in accordance with relevant legislative requirements, including the use of licensed contractors. ECO to be made aware of the details of such facilities. 4. Uncontaminated waste must be removed at least weekly for disposal; other wastes will be removed for recycling/ disposal at an appropriate frequency. 5. SABS approved spill kits to be available and easily accessible. 6. Daily inspection of all portable toilets and septic tanks must be performed by SHE/ environmental representatives on site. 7. All waste facilities and waste transportation contractors must be licensed and registered where necessary. 8. Upon the completion of construction, the area must be cleared of potentially polluting materials. Spoil stockpiles must also be removed and appropriately disposed of or the material re-used for an appropriate purpose. 9. Unless designated areas are provided, no vehicles or machinery are to be washed on the site.	Duration of Contract: EPC Contractor	SABS 089:1999 Part 1

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
Stormwater Management	Poor stormwater management and the alteration surface water resources: development footprint and surrounds	» Placement of hard engineered surfaces	Control through management and monitoring 1. Reduce the potential increase in surface flow velocities and the resultant impact on the localised drainage system through construction of break water structures at the ends of stormwater drains. 2. PV panels storage units and roads should avoid the aquatic features that have been identified as being of high sensitivity and their buffers (32m). 3. The sensitive areas (i.e. the edges of the buffers around the wetlands, channel banks) not affected by construction must clearly be demarcated and fenced off (using temporary fencing and danger tape) before any construction work or site preparation begins. These are no-go areas during the construction process, except where work is occurring. 4. Appropriately plan hard-engineered bank erosion protection structures where required. 5. Sedimentation traps should be installed along/ at the end of stormwater channels to minimise sediment flow into the hydrological systems and environment. 6. Clean and dirty stormwater systems must be installed to prevent contamination of clean stormwater systems. 7. Drainage line crossings should not trap any run-off, thereby creating inundated areas, but allow for free flowing water.	Planning and design/ Construction: Developer/Owner / EPC Contractor O&M Operator	Method statement, BAR and EMPr

b) Objective: Appropriate management of the construction site and construction workers

ENVIRONMENTAL AWARENESS TRAINING

Environmental awareness training sessions shall be run for all personnel on site. Contractor general site staff are to attend an environmental induction training of approximately 30 minutes prior to commencing with activities on site. In addition, all staff shall attend the twice weekly environmental toolbox talks as provided for by the EO and EM.

The EO shall keep a register of all personnel attending the Environmental Education Session.

SAFETY & SECURITY

The Contractor shall at all times observe proper and adequate safety precautions on the Site. Telephone numbers of emergency services, including the local fire-fighting service, shall be posted conspicuously in the Contractor's office near the telephone.

No unauthorised firearms are permitted on Site.

The Occupational Health and Safety Act (Act 85 of 1993) and in particular the requirements of the Construction Regulations issued in July 2003, must be complied with.

With the possible exception of any security staff who may be required to stay overnight at the Contractor's Camp, no personnel will be permitted to live on site.

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SOCIO ECONOMIC MANAGEMENT

Working hours in terms of the planning approval shall be adhered to. If works are to take place outside of normal working hours, the EO and the SE are to be notified and disturbance to the surrounding residents or land users is to be prevented. The SE will, where required, in turn notify the Relevant Authority of work done outside of normal working hours.

Where possible, local unskilled, semiskilled and skilled personnel should be sourced from the local community/markets.

If local suppliers are available, it is recommended that they must be used, as far as possible.

Labour intensive methods must be employed where feasible, cost effective and not time constraining.

COMMUNITY RELATIONS

The EM shall erect and maintain information boards in the position, quantity, design and dimensions specified. Such boards shall include contact details for complaints by members of the public in accordance with details provided by the SE.

All interactions with the surrounding community shall be undertaken in terms of the Stakeholder Engagement Plan b the Project Company.

The Contractor shall keep a "Complaints Register" on Site. The Register shall contain all contact details of the person who made the complaint, and information regarding the complaint itself. All grievances raised shall be dealt with in accordance with the Project Company Grievance Procedure.

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance[9]	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
Construction workers	Damage to indigenous natural vegetation and sensitive areas. Damage to and/or loss of topsoil (i.e. pollution, compaction etc.). Impacts on the surrounding environment due to inadequate sanitation and waste removal facilities. Pollution/contamination of the environment. Development footprint	» Vegetation clearing and levelling of equipment storage area/s. » Access to and from the equipment storage area/s. » Ablution facilities. » Contractors not aware of the requirements of the EMPr, leading to unnecessary impacts on the surrounding environment.	Control through management and monitoring: 1. Rehabilitate all disturbed areas within the Project Development Footprint as soon as construction is complete within an area. 2. The terms of this EMPr and the Environmental Authorisation must be included in all tender documentation and Contractors contracts. 3. Ensure that all personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimisation of environmental harm. This can be achieved through the provision of appropriate environmental awareness training to all personnel. Records of all training undertaken must be kept. o Environmental Awareness Training o Induction Training o Toolbox Talks 4. Safety representatives, managers and workers must be trained in workplace safety. The construction process must be compliant with all safety and health measures as prescribed by the relevant Act. 5. Establish the necessary ablution facilities with chemical toilets and provide adequate sanitation facilities and ablutions for workers (1 toilet per every 15 workers for each sex) at appropriate locations around the Project Site. 6. Ablution or sanitation facilities should not be located within 100 m from a 1:100 year flood line including water courses, wetlands. 7. Fire-fighting equipment and training should be provided before the construction phase commences. 8. All litter should be deposited in a clearly marked, closed,	Duration of Construction period/ Duration of Contract: EPC Contractor and sub-contractor/s	Occupational Health and Safety Act (Act 85 of 1993 Code of Conduct

[9] volumes, tonnages and hectares or m²

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance[9]	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			animal-proof disposal bin in the construction area. Particular attention needs to be paid to the management of food waste. 9. Ensure waste disposal facilities are maintained and emptied as and when required. 10. No one other than the ECO or personnel authorised by the ECO may disturb flora or fauna outside of the demarcated construction area/s. 11. Sub-Contractors appointed by the Contractor must ensure that all workers are informed at the outset of the construction phase of the conditions contained on the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms.		
Method Statements	Suspend construction activities resulting in delayed construction timeframes- Development footprint	Site establishment Site Preparation Soil management Excavations water supply and usage stormwater management water crossings Ablution facilities Solid Waste Management Liquid waste management Dust and noise pollution Hazardous substance storage	Control through management and monitoring: 1. Ensure all construction activities are undertaken with the appropriate level of environmental awareness to minimise environmental risk 2. The Method Statement must cover applicable details with regard to: • Details of the responsible person/s • Construction procedures • Materials and equipment to be used • Getting the equipment to and from site • How the equipment/material will be moved while on-site • How and where material will be stored • The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur • Timing and location of activities • Compliance/non-compliance with the Specifications, and • Any other information deemed necessary by the Site Manager. 3. The Contractor may not commence the activity covered by the Method Statement until it has been approved, except in	Duration of Construction period/ Duration of Contract: Contractors and Service Providers	EMPr

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance[9]	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			the case of emergency activities and then only with the consent of the Site Manager. 4. Suspend an activity should it not have an approved method statement.		

5.5 GENERAL REQUIREMENTS

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
MATERIAL HANDLING, USE AND STORAGE	Environmental degradation, Litter development footprint and surrounds	» General Construction activities	Control through management and monitoring: 1. In line with management of the Redstone CSP Project. 2. The Contractor shall ensure that any delivery drivers are informed of all procedures and restrictions (including "no go" areas) required to comply with the Specifications. The Contractor shall ensure that these delivery drivers are supervised during off loading, by someone with an adequate understanding of the requirements of the Specifications. 3. Materials shall be appropriately secured to ensure safe passage between destinations. Loads shall have appropriate cover to prevent them spilling from the vehicle during transit. The Contractor shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials. 4. All manufactured and/ or imported material shall be stored within the Contractor's camp. All lay down areas outside of the construction camp shall be subject to the SE's approval as per the Redstone CSP Project.	Construction: EM, EPC	EMPr

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			5. All building materials should be stored away (at least 50m) from watercourses or wetlands and the areas bunded appropriately such that there will be no runoff from these areas towards aquatic systems. All building materials should be removed after construction.		
HAZARDOUS SUBSTANCES	Environmental Degradation, Contamination: development footprint and surrounds	» General Construction activities	Control through management and monitoring; 1. The Contractor shall be responsible for any clean-up resulting from the failure by his Employees or suppliers to properly secure transported materials, in the event of a spill.	Construction: EM, EPC	EMPr
EQUIPMENT MAINTENANCE AND STORAGE	Contamination of soil: development footprint	» General Construction activities	Control through avoidance: 1. In line with management of the Redstone CSP Project. 2. Drip trays shall also be provided in construction areas for stationary plant (such as compressors) and for "parked" plant (such as scrapers, loaders, vehicles). 3. All vehicles and equipment shall be kept in good working order and serviced regularly. Leaking equipment shall be repaired immediately or removed from the Site.	Construction: EM, EPC	EMPr
WASTE MANAGEMENT	Litter, aesthetics of site, visual impact: vermin: development footprint	» General Construction activities	Control through avoidance: 1. In line with management of the Redstone CSP Project. 2. For the purposes of these Environmental Specifications, solid waste includes all debris and waste (e.g. litter, food waste, cable pieces, vegetation and tree stumps, building rubble, etc.), including hazardous waste (e.g. oils) resulting from any demolition and construction activities on site. 3. NO refuse or waste material will be disposed of by burying or burning on site.	Construction: EM, EPC	EMPr
GENERAL WASTE	Litter, aesthetics of site, visual impact: vermin: development footprint	» General Construction activities	Control through avoidance: 1. In line with management of the Redstone CSP Project. 2. Litter and waste materials (excluding rubble and hazardous waste materials) shall be disposed of into scavenger- and weather-proof bins. The Contractor shall	Construction: EM, EPC	EMPr

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			provide sufficient bins with lids on Site to store the waste produced on a daily basis. In order to facilitate recycling, it is recommended that a number of bins be provided at each location, and that such bins be clearly marked according to the category of waste being recycled (e.g. paper, metals, plastics, glass etc.) Bins shall not be allowed to become overfull and shall be Emptied a minimum of once daily.		
HAZARDOUS WASTE	Contamination of soil: development footprint	» General Construction activities	Control through avoidance should be practiced: 1. In line with management of the Redstone CSP Project.	Construction: EM, EPC	Occupational Health & Safety Act.
BUILDERS RUBBLE	Litter, aesthetics of site, visual impact: vermin: development footprint	» General Construction activities	Control through avoidance: 1. In line with management of the Redstone CSP Project. 2. Rubble shall be temporarily stockpiled in a waste skip or a central stockpile. Any rubble not being recycled (e.g. sent for crushing) or reused shall be removed from site to a registered approved landfill site as soon as it constitutes a practical load for removal and before temporary closure of the site. 3. No plastics, shrink wrap, paint buckets or any other debris that does not constitute clean building rubble, shall be stored at such stockpile sites.	Construction: EM, EPC	EMPr
PROTECTION OF NATURAL FEATURES	Environmental degradation: development footprint and surrounds	» General Construction activities	Control through avoidance: 1. The Contractor shall not deface, contaminate, paint, damage or mark any natural features (e.g. rock formations) situated in or around the Site for survey or other purposes unless agreed beforehand with the SE. Any features affected by the Contractor in contravention of this clause shall be restored/ rehabilitated to the satisfaction of the SE. 2. The Contractor shall not permit his employees to make use of any natural water sources (e.g. springs, streams, and open water bodies) for the purposes of swimming, personal washing and the washing of machinery or	Construction: EM, EPC	EMPr

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			clothes.		
WATER MANAGEMENT	Watercourse degradation: development footprint and surrounds	» General Construction activities	Control through avoidance: 1. Surface drainage measures must be established to prevent • Ponding of water; • Erosion as a result of accelerated runoff; and, • Uncontrolled discharge of polluted runoff. 2. Adequate stormwater management measures to be implemented to manage runoff and sediment volumes where compacting occurs during construction. Silt fencing, sandbags, erosion control blankets and gabions can be used to prevent erosion in susceptible construction areas, where applicable. 3. Avoidance of wetland contamination	Construction: EM, EPC	EMPr
NUISANCE MANAGEMENT: AESTHETICS & VISUAL	Environmental degradation: development footprint and surrounds	» General Construction activities	Control through management and monitoring: 1. In line with management of the Redstone CSP Project. 2. The Contractor shall take reasonable measures to ensure that construction activities do not have an unreasonable impact on the aesthetics of the area.	Construction: EM, EPC	EMPr
NUISANCE MANAGEMENT: DUST CONTROL	Environmental degradation: development footprint and surrounds	» General Construction activities	Control through management and monitoring: 1. In line with management of the Redstone CSP Project. 2. The Contractor shall take all reasonable measures to minimise the generation of dust as a result of construction activities to the satisfaction of the SE and EO. Dust control measures may include the stabilization of disturbed areas via the mechanical surface wetting or chemical stabilsation. In extreme instances, the use of specific dust suppressant additives may be necessary in order to limit dust generation from haul roads. 3. During high wind conditions, the Contractor shall comply with the SEs instructions regarding dust- suppression	Construction: EM, EPC	EMPr

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			measures. The SE may request the temporary cessation of all construction activities where wind speeds are unacceptably high, and until such time as wind speeds return to acceptable levels. 4. It is recommended that the EPC Contractor maintain a dust suppression register, which is to be issued to the EM on a monthly basis.		
NUISANCE MANAGEMENT: NOISE MANAGEMENT	Noise pollution: development footprint and surrounds	» General Construction activities	Control through management and monitoring: 1. In line with management of the Redstone CSP Project. 2. The noisiest construction activities will, wherever possible be limited to normal working hours, unless otherwise permitted. Working hours in terms of the planning approval shall be adhered to. If works are to take place outside of normal working hours, the EO and the SE are to be notified and disturbance to the surrounding residents or land users is to be prevented. The SE will, where required, in turn notify the Relevant Authority of work done outside of normal working hours.	EM & SE	EMPr
EXCAVATION AND TRENCHING	Environmental degradation: development footprint and surrounds	» General Construction activities » Underground or surface cabling	Control through avoidance: 1. In line with management of the Redstone CSP Project. 2. During excavation and trenching activities, care is to be taken to ensure that the stockpiling of top material is kept separate from sub-soils. Top material thus saved is to be replaced as top material and is to be the final layer when back-filling. The Contractor shall reinstate all working areas to the satisfaction of the SE. 3. Areas opened for trenching should be restricted to the minimum required to be worked in and closed up in a working day or as dictated by technical requirements such as length of pipe or cable, in order to prevent them from posing safety hazards to people, traffic and animals and to prevent rainwater erosion. 4. Trench side walls are to be sloped with a 1:3 gradient to allow fauna the opportunity to climb out of the trenches.	SE	EMPr

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			Daily inspection of trenches for animals is to be undertaken. Work areas to be kept to the minimum to reduce habitat loss. 5. Trenches shall be re- filled to the same level as (or slightly higher to allow for settlement) the surrounding land surface to minimise erosion. 6. In the event of material removed during trenching being excessive after backfilling or being unsuitable as overburden, the excess material must be removed from the construction site to a site agreed upon by the SE and, where applicable, the Local Authority.		
CONCRETE AND CEMENT WORK	Environmental degradation: development footprint and surrounds	» General Construction activities	Control through avoidance: 1. In line with management of the Redstone CSP Project. 2. Cement powder has a high pH, the spillage of dry cement powder and concrete slurry will thus affect both soil and water pH adversely. Careless handling of cement products resulting in spillage can have detrimental effects on the surrounding environment. 3. Cement is to be stored in a secure weatherproof location to avoid contamination of the environment. 4. All visible remains of excess concrete shall be physically removed to an approved Municipal waste site on completion of the plaster or concrete pour section and disposed of.	Duration of Contract: Contractor: EPC, EM and SE	EMPr
CONTAMINATED WATER	Environmental degradation: development footprint and surrounds	» General Construction activities	Control through avoidance: 1. Potential pollutants of any kind and in any form, shall be kept, stored, and used in such a manner that any escape can be contained and the water table not endangered. Water containing such pollutants as cements, concrete, lime, chemicals, fuels and hydrocarbons shall be contained and discharged into an impermeable storage facility for removal from the site or for recycling.	Duration of Contract: Contractor: EPC, EM and SE	EMPr

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
FIRE CONTROL	Environmental degradation: development footprint and surrounds	» General Construction activities	Control through avoidance: 1. In line with management of the Redstone CSP Project. 2. No fires may be lit on site. Any fires, which occur, shall be reported to the SE immediately. Smoking shall not be permitted in those areas where it is a fire hazard. Such areas shall include the workshop and any areas where the vegetation or other material is liable to the rapid spread of an initial flame. In terms of the Atmospheric Pollution Prevention Act, burning is not permitted as a disposal method. 3. Fire Control Officer as per Redstone CSP Project. 4. The Contractor shall ensure that there is basic fire-fighting equipment available on Site at all times.	Duration of Contract: Contractor: EPC, EM and SE	EMPr
ENVIRONMENTAL EMERGENCY PROCEDURES	Environmental degradation: development footprint and surrounds	» General Construction activities	Control through avoidance: 1. The Contractor shall submit Method Statements covering the procedures for the following emergencies: • FIRE The Contractor shall advise the relevant authority of a fire as soon as one starts and shall not wait until he can no longer control it. The Contractor shall ensure that his employees are aware of the procedure to be followed in the event of a fire. • ACCIDENTAL LEAKS AND SPILLAGES The Contractor shall ensure that his employees are aware of the procedure to be followed for dealing with spills and leaks, which shall include notifying the SE and the relevant authorities. The Contractor shall ensure that the necessary materials and equipment for dealing with spills and leaks is available on site at all times. Treatment and remediation of the spill areas shall be undertaken to the reasonable satisfaction of the SE. 2. In the event of a hydrocarbon spill, the source of the spillage shall be isolated, and the spillage contained. The area shall be cordoned off and secured. The spill needs	Duration of Contract: Contractor: EPC, EM and SE	EMPr

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			to be treated and disposed of in accordance with the Method Statement and the site cleared within 48 hours of the incident. 3. All moderate to major spills to be recorded within 24 hours of the incident occurring: a) Date and time of spill b) Direction spill is moving (or if it has stopped) c) Name and phone number of persons close to the location of the spill d) Type of containment spilled, and quantity spilled e) Cause of spill f) Whether the spill is continuing or has stopped g) Description of the existing containment h) Actions taken to recover, clean-up and dispose of spilled containment 4. Spill kits need to be on site at all times, and accessible and checked on a monthly basis to ensure good working order.		
TEMPORARY SITE CLOSURE	Environmental degradation: development footprint and surrounds	» General Construction activities	Control through avoidance: 1. In line with requirements of the Redstone CSP Project. 2. If the Site is closed for a period exceeding one week, a checklist procedure shall be carried out by the Contractor in consultation with the EM. Contractor's Safety Officers (in terms of the Occupational Health and Safety Act) are to check, the Site and report to the SE regarding the following: • Other: o All trenches and manholes secured with hard barricading or backfilled. o Fencing and barriers in place per the Occupational Health and Safety Act (No. 85 of 1993). o Notice boards applicable and secured. o Security persons briefed and have facility for	Duration of contract: Contractor, EM and EO.	Occupational Health and Safety Act (No. 85 of 1993).

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			contact. o Night hazards checked e.g. reflectors, lighting, traffic signage. o Fire hazards identified – local authority notified of any potential threats e.g. large brush stockpiles, fuels etc. o Pipe stockpile wedged / secured. o Scaffolds secure. o Inspection schedule and log by security or contracts staff. • The EO is to check and report to the SE regarding the following issues: o Wind and dust mitigation in place e.g. straw, brush packs, irrigation. o Slopes and stockpiles at stable angle. o Landscape areas watering schedules & supply secured. o Fuels/hazardous substances stores secure. o Cement and materials stores secured o Toilets empty and secured o Refuse bins empty and secured (lids) o Bunding clean and treated e.g. Spill Sorb or Enretech # 1 powder o Drip trays empty & secure (where possible) o Structures vulnerable to high winds secure. o The Contractor is to ensure that all temporary closure requirements are met before leaving the Site.		
SITE CLEAN UP	Environmental degradation: development footprint and surrounds	» General Construction activities	Control through management and monitoring: 1. The Contractor shall ensure that all temporary structures, equipment, materials, waste and facilities used for construction purposes are removed upon completion of the project. The site cleanup shall be to the satisfaction of the SE and the EO.	SE and EO	BAR and EMPr

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
REHABILITATION	Environmental degradation: development footprint and surrounds	» General Construction activities	Remedy through rehabilitation: 1. Where appropriate, the contractor shall Employ a suitably qualified person (a botanist with experience in restoration of grassland areas) to rehabilitate areas damaged by construction activities during the course of the project. The Contractor shall be responsible for rehabilitating areas identified by the EO and the SE, or recommended by the aforementioned botanist. The Contractor's procedure for rehabilitation shall be approved by the EM and the SE and, where required, the Local Authority environmental representative. Refer to Appendix 3E – Revegetation and Rehabilitation Management Plan.	Post Construction: EO, EM and SE.	BAR and EMPr
PENALTIES	Environmental degradation: development footprint and surrounds	» General Construction activities	Remedy through rehabilitation" 1. Where the Contractor inflicts damage upon the environment or fails to comply with any of the Environmental Specifications contained within this EMPR, he shall be liable to pay a penalty for breach of the conditions of the Environmental Specifications which form part of the works contract. 2. The Contractor is deemed NOT to have complied with this Specification if: • There is evidence of contravention of the Specification within the boundaries of the site, site extensions and haul/ access roads; • Environmental damage ensues due to negligence; • The Contractor fails to comply with corrective or other instructions issued by the SE with in a specific time; or • The Contractor fails to respond adequately to complaints from the public. 3. Penalties shall be issued per incident and per individual for the Contractor's responsibility. The amount of the penalty shall be determined by the SE, in consultation	Duration of Contract: Contractor: EPC, EM and SE	EMPr

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			with the EO. The SE shall inform the Contractor of the contravention and he shall notify the consulting quantity surveyor to deduct such a penalty from monies due under the Contract prior to the issuing of the monthly payment certificates. 4. Payment of any penalties in terms of the contract shall not absolve the offender from being liable from prosecution in terms of any law. 5. The following penalties (not an exclusive list) shall be issued in addition to any remedial costs incurred as a result of non-compliance with the Environmental Specification and shall be imposed by the SE on the Contractor for contraventions of the Environmental Specifications by individuals or operators Employed by the Contractor and/or his Sub-contractors. • An individual failing to adhere to speed limit • An individual driving a vehicle in a no-go area • A plant operator ignoring a written warning to have an oil leak from his machinery repaired • An individual littering on site • An individual not making use of the ablution facilities • An individual making an illegal fire on site • An individual/contractor causing unnecessary damage to flora and fauna on site • An individual/team wasting water • An individual/contractor not reporting a suspected archaeological find to the EM 6. For each subsequent similar offence committed by the same individual, the penalty shall be doubled in value. The following penalties are suggested for transgressions where damage has been done to the environment: • Erosion: A penalty equivalent in value to the cost of rehabilitation plus 20% • Oil spills: A penalty equivalent in value to the cost		

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			of cleanup operation plus 20% • Damage to sensitive environments: A penalty equivalent in value to the cost of restoration plus 20%. • Damage to archaeological finds: A penalty as determined by the SAHRA shall be paid for any damage to any archaeological sites/finds 7. All monies collected through penalties shall be held in an environmental fund by the Project Company and used for the rehabilitation and environmental protection of the Project Site.		

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6. OPERATIONAL ENVIRONMENTAL MANAGEMENT PROGRAM (OEMPR)

6.1 SCOPE

This Specification covers the requirements for controlling the impact on the environment of operational activities.

6.2 SHARED AUXILIARY INFRASTRUCTURE/ SERVICES

The Redstone PV Project will be operated simultaneously to the Redstone CSP Project. Project resources and infrastructure will be shared where applicable for the duration of the operational stage. In this regard, the activities and/or facilities relevant to the operational phase as listed below will be shared between the PV Power Project and the Redstone CSP Project.

Auxiliary Infrastructure/ services	Shared CSP service
Storage of chemicals and hazardous substances	✓
Management of waste streams	✓
Fire management	✓

6.3 MONITORING AND AUDITING

Monitoring and Auditing will be done as per the Redstone CSP Facility as infrastructure, roles and responsibilities will be shared between the two power generating facilities.

6.4 AIM AND PURPOSE OF THE EMPR

This EMPR aims to provide the Project Company with the necessary tools to ensure that the potential impacts on the environment during the operation of the development are minimised. Moreover, it aims to ensure that the infrastructure is operated and maintained according to Best Practice. The EMPR aims to ensure that the development is maintained and operated in an environmentally sensitive and sustainable manner, and that the operation of the development does not result in reasonably avoidable environmental impacts.

The EMPR is a working document that may be amended to enhance its effectiveness for environmental control. Therefore, not all specifications and details are prescribed here but should be discussed and the best possible practicable application made by the responsible parties.

a) Objective: To optimally facilitate operation of the PV Power Project

CLEAR REPORTING, COMMUNICATION, AND RESPONSIBILITIES IN RELATION TO OVERALL IMPLEMENTATION OF ENVIRONMENTAL MANAGEMENT PROGRAMME DURING OPERATION

Formal responsibilities are necessary to ensure that key procedures are executed.

PROTECTION OF INDIGENOUS NATURAL VEGETATION, FAUNA AND MAINTENANCE OF REHABILITATION

Indirect impacts on vegetation and terrestrial fauna during operation could result from maintenance activities and the movement of people and vehicles on site. In order to ensure the long-term environmental integrity of the site following construction, maintenance of the areas rehabilitated post-construction must be undertaken until these areas have successfully re-established.

MINIMISATION OF VISUAL IMPACTS

The primary visual impact of the facility and its ancillary infrastructure, is not possible to mitigate. The number of sensitive visual receptors within the region is low, with a minor cumulative impact on the visual and aesthetic surrounding environment.

MINIMISATION OF SOIL DEGRADATION AND EROSION

The soil on site may be impacted in terms of:

- Soil degradation including erosion (by wind and water) and subsequent deposition elsewhere is of a concern across the entire site which is underlain by fine grained soil which can be mobilised when disturbed, even on

relatively low slope gradients (accelerated erosion).

- Uncontrolled run-off relating to construction activity (excessive wetting, uncontrolled discharge, etc.) will also lead to accelerated erosion and possible sedimentation of drainage systems.

- Degradation of the natural soil profile due to pollution.

MINIMISATION OF DUST AND AIR EMISSIONS

During the operational phase, limited gaseous or particulate emissions are anticipated from exhaust emissions (i.e. from operational vehicles). Windy conditions and the movement of vehicles on site may lead to dust creation.

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
Reporting	Management of facility development footprint	» Reporting » Management » Execution of activities » Roles and responsibilities	Control through management and monitoring 1. Formal responsibilities are necessary to ensure that key procedures are executed. Specific responsibilities of the Operations Manager, and Environmental Manager for the operation phase of this Project are detailed below. 2. The Project Manager will: o Ensure that adequate resources (human, financial, technology) are made available and appropriately managed for the successful implementation of the operational EMPr. o Conduct annual basis reviews of the EMPr to evaluate its effectiveness. o Take appropriate action as a result of findings and recommendations in management reviews and audits. o Provide forums to communicate matters regarding environmental management. 3. The EM will: o Develop and Implement an Environmental Management System (EMS) for the PV Power Project. o Manage and report on the PV Power Project environmental performance. o Maintain a register of all known environmental impacts and manage the monitoring thereof. o Conduct internal environmental audits and co-ordinate external environmental audits. o Liaise with statutory bodies such as the National and Provincial Department of Environmental Affairs (DEA) on environmental performance and other issues. o Conduct environmental training and awareness for the employees who operate and maintain the PV Power Project	Operational phase- all	EMPr

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			○ Liaise with interested and affected parties on environmental issues of common concern. ○ Track and control the lodging of any complaints regarding environmental matters. 4. The EM must provide fourteen (14) days written notification the DEA that the activity operational phase will commence.		
Protection of indigenous natural vegetation, fauna and maintenance of rehabilitation	»Disturbance to or loss of vegetation and/or habitat. »Environmental integrity of site undermined resulting in reduced visual aesthetics, erosion, compromised land capability and the requirement for on-going management intervention. »Loss of protected faunal species: For development footprint and surrounds.	» Movement of employee vehicles within and around site.	Control through management and monitoring: 1. Vehicle movements must be restricted to designated roadways. 2. Existing roads must be maintained to ensure limited erosion and impact on areas adjacent to roadways. 3. An on-going alien plant monitoring and eradication programme must be implemented, where necessary. 4. A faunal/ avifauna incident register must be maintained on site. 5. Implementation of an animal removal plan to ensure safety of workers and scavengers. 6. Ensure the absence of larger animals through frequent patrols, particularly prior to land clearance. 7. Restrict losses of natural habitat to footprints, avoid peripheral or unnecessary losses of natural habitat; ensure proper rehabilitation of areas outside development footprints (where accidental habitat degradation occurred). 8. Avoid encroachment of alien and invasive plant species. 9. Worker/ contractor awareness programmes, ensuring minimal conflict situation, control of human movement in adjacent natural habitat, frequent patrols, biological monitoring programmes, animal control (vervet monkeys, feral cats, rats, baboons, dogs, etc)	Operational: Owner O&M Operator	EMPr

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			10. Implement generic monitoring programme and mitigation measures that are aimed at identifying and preventing the uncontrolled spread of impacts into adjacent areas of natural habitat.		
Avifauna	Loss of avifauna due to interactions with humans and site infrastructure-development footprint	» Disturbance and Displacement. » Collision with or entrapment by fencing » Electrocution on electrical infrastructure » Chemical Pollution	Control through management and monitoring: 1. Where possible, infrastructure should be located away from known bird flight paths or features which are attractive to birds, e.g. natural or man-made open water areas or agricultural fields. 2. To limit bird traffic across the site, perchable structures should be avoided where possible. 3. Lighting should be kept to a minimum to avoid attracting insects and birds and light sensors/switches should be utilised to keep lights off when not required. 4. Lighting fixtures should be hooded and directed downward, to minimize the skyward and horizontal illumination which could attract night-flying birds (Ledec et al., 2010). 5. Where possible, lighting should be intermittent or flashing-beam lights. 6. Careful selection of and modifications to solar facility equipment should be made where possible. 7. Develop and implement an operational monitoring programme for birds in line with applicable guidelines. 8. Frequent and regular review of operational phase monitoring data and results by an avifaunal specialist. 9. The above reviews should strive to identify sensitive locations at the development including that may require additional mitigation. If unacceptable impacts are observed (in the opinion of the bird specialist and independent review), the specialist should conduct a	Operational: EM, ECO	EMPr; Avifauna Report

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			literature review specific to the impact and provide updated and relevant mitigation options to be implemented. As a starting point for the review of possible mitigations, the following may need to be considered: 10. Assess the suitability of using deterrent devices to reduce collision risk. 11. A single fence should be used, which can be electrified and animal proofed. 12. Develop and implement an operational monitoring programme for birds in line with applicable guidelines. 13. Frequent and regular review of operational phase monitoring data and results by an avifaunal specialist. 14. If collision with fences occurs, the specialist should consider the need to implement mitigation in the form of visual bird flight diverters attached to the fence to increase its visibility to birds. 15. All on site power cables and power lines to be buried underground. 16. All electrical installations and infrastructure should be properly insulated to prevent any chance of electrical faulting caused by birds 17. All contractors are to adhere to the Operational Environmental Management Plan (OEMP) and should apply good environmental practice during all operations. 18. All cleaning products used on the site should be environmentally friendly and bio-degradable.		
Stormwater management	Erosion will result in a loss of soil from the receiving water resources and changes	» Discharge of stromwater from the site	Control through management and monitoring: 1. A minimum buffer area of 32m should be maintained between the proposed PV Power Plant development area and the Groenwater Spruit riparian zone. If	Operational phase: EM, ECO	Wetland specialist study

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
	in geomorphology. A further increase in impervious surfaces on site will result in increased runoff. Stormwater discharges could impact on water quality within receiving watercourses. Site and surrounds can be impacted.		possible, this buffer zone should be increased further. The buffer zone must be maintained as a fully vegetated buffer strip between the development and the riparian habitat. No intrusion into the buffer should be allowed. 2. A stormwater management plan must be developed and implemented for the proposed PV Power Plant. Stormwater discharge points must be protected against erosion. No stormwater discharges directly into the Groenwater Spruit, but rather into vegetated terrestrial areas adjacent to the riparian habitat. 3. Strict controls must be placed on the sue of potential contaminants on site, e.g. hydrocarbons, cleaning materials etc. Potential contaminants must be stored in suitable bunded areas and handled according to environmental best practice guidelines as per the DWS Integrated Environmental Management Series.		
Visual impacts	» Visual impact of facility degradation and vegetation rehabilitation failure. » Lighting influences from the facility on surrounding areas	» The proposed facility. » Power lines.	Control through management and monitoring: 1. Maintain the general appearance of the PV Power Project in an aesthetically pleasing way. 2. Access roads will require an effective dust suppression management programme, such as regular wetting and / or the use of non-polluting chemical stabilisation that will retain moisture in the road surface. 3. Monitor rehabilitated areas, and implement remedial action as and when required. 4. Use of light fixtures and the fitment of covers and shields will be designed to contain rather than spread light, wherever possible. o Install light fixtures that provide precisely directed illumination to reduce light “spillage” beyond the immediate surrounds of the Project Site. Limit	Operational: Owner O&M Operator	EMPr

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			mounting heights of lighting fixtures, or alternatively use foot-lights or bollard level lights. o Make use of minimum lumen or wattage in fixtures. o Make use of down-lighters, or shielded fixtures wherever possible. o Make use of Low Pressure Sodium lighting or other types of low impact lighting wherever possible. o Make use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes wherever possible. o Avoid high pole top security lighting along the periphery of the site, where possible, unless a security risk is posed and consider the use of lights that are activated on movement at illegal entry to the Project Site.		
Soil degradation and erosion	» Soil degradation. » Soil erosion. » Increased deposition of soil into drainage systems. » Increased run-off over the sit: » Development footprint and surrounds.	» Poor rehabilitation of cleared areas. » Rainfall - water erosion of disturbed areas. » Wind erosion of disturbed areas. » Concentrated discharge of water from construction	Control through management and monitoring: 1. Rehabilitate disturbance areas should the previous measures to do so be inadequate. 2. Ensure dust control on site: wetting of denuded areas or the use of an appropriate dust suppression measure. 3. Maintain erosion control measures implemented during the construction phase (i.e. run-off attenuation on slopes (sand bags, logs), silt fences, stormwater catch-pits, and shade nets).	Operational: Owner O&M Operator	EMPr

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
		activity			
Dust and air emissions	» Dust and particulates from vehicle movement to and on-site. » Release of minor amounts of air pollutants (for example NO2, CO and SO2) from vehicles: Development footprint.	» Re-entrainment of deposited dust by vehicle movements. » Wind erosion from unsealed roads and surfaces. » Fuel burning vehicle and construction engines.	Control through management and monitoring: 1. Roads must be maintained to a manner that will ensure that nuisance to the community from dust is not visibly excessive. 2. Appropriate dust suppressant with high moisture retention properties must be applied to the roads as required to minimise/control airborne dust. 3. Speed of vehicles must be restricted, as defined by the SHEQ Manager. 4. Vehicles and equipment must be maintained in a road-worthy condition at all times.	Operational: Owner	EMPr
Fire management plan	» Veld fires can pose a personal safety risk to local farmers and communities, and their homes, crops, livestock and farm infrastructure, such as gates and fences. In addition, fire can pose a risk to the Project infrastructure for both PV and adjacent CSP facilities.	» The presence of operation and maintenance personnel and their activities on the site can increase the risk of veld fires.	Control through management and monitoring: 1. In line with management of the Redstone CSP Project. 2. Provide adequate fire-fighting equipment on site. 3. Use Fire-fighting selected operation and maintenance staff as for Redstone CSP Project. 4. Ensure that appropriate communication channels are established to be implemented in the event of a fire. 5. Fire breaks should be established where and when required. Cognisance must be taken of the relevant legislation when planning and burning firebreaks (in terms of timing, etc.). 6. Contact details of emergency services should be prominently displayed on site.	Operational: Owner O&M Operator	EMPr and National Veld and Forest Fire Act, Act No. 101 of 1998.

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
Handling and management of hazardous substances, dangerous goods and waste	» Inefficient use of resources resulting in excessive waste generation. » Litter or contamination of the site or water through poor waste management practices. »Contamination of water or soil because of poor materials management	» Transformers and switchgear – substation. » Hazardous substances and dangerous goods. » Disposal of batteries.	Control through management and monitoring: 1. Handling, storage and disposal of hazardous substances must be managed in accordance with the Redstone CSP Project.	Operational: Owner O&M Operator, waste management contractor	EMPr

7. DECOMMISSIONING AND CLOSURE ENVIRONMENTAL MANAGEMENT PROGRAM

7.1 SCOPE

This Specification covers the requirements for controlling the impact on the environment in the event the facility is closed and decommissioned.

7.2 SHARED AUXILIARY INFRASTRUCTURE/ SERVICES

The Redstone PV Project will be decommissioned simultaneously to the Redstone CSP Project. Project resources and infrastructure will be shared where applicable for the duration of the decommissioning stage. In this regard, the activities and/or facilities relevant to the decommissioning phase as listed below will be shared between the PV Power Project and the Redstone CSP Project.

Auxiliary Infrastructure/ services	Shared CSP service
Storage of chemicals and hazardous substances	✓
Management of waste streams	✓
Contractor Camps	✓
Laydown areas	✓

7.3 . MONITORING AND AUDITING

Monitoring and Auditing will be done as per the Redstone CSP Facility as infrastructure, roles and responsibilities will be shared between the two power generating facilities, this will entail ensuring that leading and lagging indicators are managed and the EMS system functions.

7.4 AIM AND PURPOSE OF THE EMPR

The PV Power Project is expected to have a lifespan of 20-25 years and eventual extension (i.e. with maintenance), if deemed necessary. A detailed plan for the decommissioning and closure of the PV Power Project will be drawn up before operations are ceased and submitted to the relevant CA for authorisation and ultimate implementation.

Just as when a PV Power Project is installed, the removal of the infrastructure associated with the project will involve the preparation of the area, given the amount of machinery and workers that will remain and work on the decommissioning. Since the decommissioning is expected to take place within less than a year after the cessation of activity, it is estimated that the access roads will be in good condition and be appropriate for the transit of machinery (heavy cranes, special trucks, etc.), so that only slight improvements or additions will be needed, and these will be limited to certain sections of the service road.

Prior to the decommissioning works themselves, all waste materials and chemicals will be removed for reuse in other facilities or proper management through authorised waste management service providers.

This EMPR aims to provide the Project Company with the necessary tools to ensure that the potential impacts on the environment during the closure and decommissioning of the development are minimised. Moreover, it aims to ensure that the project site is rehabilitated according to Best Practice.

The EMPR is a working document that may be amended to enhance its effectiveness for environmental control. Therefore, not all specifications and details are prescribed here but should be discussed and the best possible practicable application made by the responsible parties.

DECOMMISSIONING ACTIVITIES

Similar to construction, the removal of the infrastructure associated with the project would involve the preparation of the area, given the amount of machinery and workers that will remain and work on the decommissioning. The following decommissioning activities are relevant:

- Reusable elements are components that can be used again, i.e., are not waste. It is advantageous to find a use for these so-called sub-products, due to the reduced costs involved with the consequent economic and environmental benefits. The possible sub-products from the PV Power Project will be multiple in terms of type, quantity and volume. Thus, certain substances are not considered “usable”, such as lubricants, etc. Other materials from the plant may be reusable in other such facilities, depending on their condition.

» Concrete structures and buildings (including foundations) will be demolished and the rubble will be disposed of at appropriate facilities, unless otherwise agreed for an alternative use in line with the decommissioning and closure plan.

REHABILITATION

Following decommissioning and removal of all project material from the site, the disturbed areas will be rehabilitated to pre-project land capability. Where possible, rehabilitation will be conducted concurrently with decommissioning. The following rehabilitation activities are relevant:

» The existing profiles of the land affected will be improved and stabilised thereby leaving profiles not incompatible with the topography of the area, which is essentially flat.

» Ripping of compacted soils will be done prior to adding topsoil, which will be done by mechanical means. It is expected that there will be a sufficient amount of topsoil and/or subsoil moved and stockpiled during the construction phase to facilitate rehabilitation.

» If required, potential areas or land for extracting topsoil or subsoil will be identified. The land capability characteristics of such areas should be similar to the affected soils (same texture, colour, permeability, etc.).

» Vegetation will be re-established. The plant species used will match those naturally occurring in the area. This will be conducted in consultation with a biodiversity specialist.

AFTERCARE AND MAINTENANCE

Following rehabilitation, a period of maintenance and aftercare will be required to ensure that rehabilitation is successful. In this regard, the following activities are relevant:

» Fertilisation of soil depending on soil fertility test results.

» Control and removal alien/invasive species.

» Implementation of erosion controls (if required).

» Auditing of vegetation recover and adaption of strategies where necessary.

a) Objective: Minimise impacts related to the decommissioning phase.

MINIMISATION OF IMPACTS RELATING TO THE DECOMMISSIONING OF A SITE

The Contractor must take all reasonable measures to ensure the safety of the public in the surrounding area. Where the public could be exposed to danger by any of the works or site activities, the contractor must, as appropriate, provide suitable flagmen, barriers and/or warning signs in English, Afrikaans and any other relevant languages, all to the approval of the Site Manager.

All unattended open excavations shall be adequately demarcated and/or fenced (fencing shall consist of a minimum of three strands of wire wrapped with danger tape). Adequate protective measures must be implemented to prevent unauthorised access to the working area and the internal access/haul routes.

MINIMISATION OF IMPACTS FAUNA AND FLORA

The Contractor must take all reasonable measures to limit impacts on fauna and flora in and around the development footprint

APPROPRIATE HANDLING AND WASTE MANAGEMENT

The decommissioning of the PV Power Project will involve the generation of various wastes. In order to manage the wastes effectively, guidelines for the assessment, classification, and management of wastes, along with industry principles for minimising decommissioning wastes must be implemented. The main wastes expected to be generated during the decommissioning phase include:

» general solid waste

» inert waste (rock, soil and concrete)

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
Decommissioning of site	» Hazards to landowners and public. » Damage to indigenous natural vegetation, due largely to ignorance of where such areas are located. » Loss of threatened plant species and protected tree species.	» Open excavations from removal of underground cabling and foundations. » Movement of vehicles in the area and on-site.	Remedy through rehabilitation: 1. Before the commencement of decommissioning, the EMPr must be reviewed and amended by an environmental assessment practitioner (EAP). 2. Secure site, working areas and excavations in an appropriate manner, as agreed with the PM. 3. Where necessary control access, fence, and secure area. Establish the necessary ablution facilities with chemical toilets and provide adequate sanitation facilities and ablutions for workers (1 toilet per every 15 workers for each sex) at appropriate locations around the Project Site. 4. Ablution or sanitation facilities should not be located within 100 m from a 1:100 year flood line including water courses, wetlands. 5. All work sites must be kept free of waste. No solid waste may be burned or buried on site or disposed of by any other method on site or within quarries or borrows pits. Solid waste (general waste) to be disposed of at the nearest permitted municipal landfill site. 6. Supply adequate weather and vermin proof waste collection bins and skips (covered at minimum with secured netting or shadecloth) at site where decommissioning is being undertaken. Separate bins should be provided for general and hazardous waste. As far as possible, provision should be made for separation of waste for recycling. 7. Liquid waste: o No liquid waste, including grey water, may be discharged into any water body or drainage line. All sewage disposal to take place at a registered and operational wastewater treatment works.	Decommissioning: Owner	SABS 089: 1999 Part 1

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			8. Hazardous substances and hazardous waste: o Ensure compliance with all national, regional and local legislation with regard to the storage, handling and disposal of hydrocarbons, chemicals, solvents and any other harmful and hazardous substances and materials. o The onus is on the Contractor to identify and interpret the applicable legislation. o Hazardous waste to be disposed of at a registered h:H or H:H landfill site. Depending on the classification of the waste, a registered service provider with the necessary permits is to collect, transport and dispose of hazardous waste. 9. The quantity of water needed for the duration of the decommissioning phase is to be calculated and planned for in detail.		
Avifauna	Loss of avifauna	» Decommissioning of the solar energy facility. » Habitat destruction » Disturbance and Displacement	1. All contractors are to adhere to the Decommissioning Environmental Management Plan (DEMP) and should apply good environmental practice during construction. 2. Existing roads and farm tracks should be used where possible 3. The minimum footprint areas of infrastructure should be used wherever possible, including road widths and lengths 4. ECO to oversee activities and ensure that the site specific decommissioning environmental management is implemented and enforced 5. Following decommissioning, rehabilitation of all areas disturbed (e.g. temporary access tracks and laydown areas) must be undertaken and to this end a habitat restoration plan is to be developed by a specialist. 6. All contractors are to adhere to the Decommissioning Environmental Management Plan (DEMP) and should apply good environmental practice during decommissioning.	Decommissioning: Owner	EMPr

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			7. Prior to decommissioning commencing, the appointed ECO must be trained by an avifaunal specialist to identify the potential Red Data species as well as the signs that indicate possible breeding by these species. The ECO must then, during audits/site visits, make a concerted effort to look out for such breeding activities of Red Data species, and such efforts may include the training of construction staff (e.g. in Toolbox talks) to identify Red Data species, followed by regular questioning of staff as to the regular whereabouts on site of these species. If any of the Red Data species are confirmed to be breeding (e.g. if a nest site is found), decommissioning activities within 500 m of the breeding site must cease, and an avifaunal specialist is to be contacted immediately for further assessment of the situation and instruction on how to proceed.		
Fauna and flora	» Loss of indigenous vegetation and fauna	» Decommissioning of the solar energy facility. » Movement of vehicles. » Worker activities on site	Remedy through rehabilitation: 1. Undertake activities as prescribed by the legislation at the time of decommissioning and comply with all legal requirements administered by the competent authority at the time. 2. Minimise vegetation clearance or removal associated with site decommissioning activities, trim trees under supervision. Compile a method statement specific to vegetation clearance. 3. Areas to be cleared must be clearly marked in the field to eliminate unnecessary clearing. 4. Limit unnecessary impacts on surrounding natural vegetation, e.g. driving around in the veld, use access roads only. 5. Driving is only allowed on access roads and within designated areas in the development footprint. 6. A site rehabilitation programme must be implemented 7. Ensure signs are placed around site indicating protected and dangerous faunal species.	Decommissioning: Owner	EMPr

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
			8. Animals that cannot flee from the affected areas by themselves (e.g. tortoises, amphibians, small mammals) must be removed from the affected areas before the start of site decommissioning and relocated to safe areas. 9. Traffic calming or extensive use of speed limit/ warning signs must be installed along access roads to prevent/ reduce faunal mortalities. 10. Ensure the absence of larger animals through frequent patrols, particularly prior to land clearance. 11. Restrict losses of natural habitat to footprints, avoid peripheral or unnecessary losses of natural habitat; ensure proper rehabilitation of areas outside development footprints (where accidental habitat degradation occurred). 12. Avoid encroachment of alien and invasive plant species. 13. Worker/ contractor awareness programmes, ensuring minimal conflict situation, control of human movement in adjacent natural habitat, frequent patrols, biological monitoring programmes, animal control (vervet monkeys, feral cats, rats, baboons, dogs, etc) 14. Implement generic monitoring programme and mitigation measures that are aimed at identifying and preventing the uncontrolled spread of impacts into adjacent areas of natural habitat		
Handling and storage of chemicals, hazardous substances	» Release of contaminated water from contact with spilled chemicals » Generation of contaminated wastes from used chemical containers » Pollution of	» Vehicles associated with site infrastructure removals and earthworks. » Decommissioning activities of area and linear	Remedy through avoidance: 1. Spill kits must be made available on-site for the clean-up of spills and leaks of contaminants. 2. Corrective action must be undertaken immediately if a complaint is made, or potential/actual leak or spill of polluting substance identified. This includes stopping the contaminant from further escaping, cleaning up the affected environment and implementing preventive measures.	Decommissioning: Owner	SABS 089:1999 Part 1.

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
	water and soil resources	infrastructure. » Hydrocarbon use and storage.	3. In the event of a major spill or leak of contaminants, the relevant administering authority must be immediately notified as per the notification of emergencies/incidents. 4. A bioremediation procedure and procurement plan must be drawn up prior to decommissioning to ensure prompt application in the event of a major spill. 5. In the event where more than 20 L of hydrocarbon or chemical is spilt into the environment, bioremediation must be undertaken under the discretion of the EM. 6. Any contaminated/polluted soil must be removed and stored as hazardous waste and disposed of at a licensed hazardous waste disposal facility. Contaminated soil must be stored in a sealed container as per the requirements of SABS 089:1999 Part 1. 7. Any storage and disposal permits/approvals which may be required must be obtained, and the conditions attached to such permits and approvals will be complied with. 8. Transport of all hazardous substances must be in accordance with the relevant legislation and regulations 9. Upon the completion of decommissioning, the area must be cleared of potentially polluting materials.		
Waste Management	» Inefficient use of resources resulting in excessive waste generation » Litter or contamination of the site or water through poor waste management practices	» Packaging » Other decommissioning wastes » Hydrocarbon and chemical use, handling and storage » Spoil material from excavation, earthworks and site preparation	Remedy through avoidance and management: 1. Hydrocarbon waste including contaminated soil must be contained and stored in sealed containers within a SABS 089:1999 Part 1 approved bunded area and clearly labelled. 2. Documentation (waste manifest) must be maintained detailing the quantity, nature, and fate of any regulated waste. Waste disposal records must be available for review at any time. 3. Regularly serviced chemical toilets facilities must be used to ensure appropriate control of sewage. 4. Ensure that there is at least 1 portable toilet per 15 workers for each sex.	Decommissioning: Owner	SABS 089:1999 Part 1

ASPECT AFFECTED	POTENTIAL IMPACT - SIZE AND SCALE of disturbance	ACTIVITIES	MITIGATION MEASURES	TIME PERIOD FOR IMPLEMENTATION & RESPONSIBILITY	COMPLIANCE WITH STANDARDS
	» Increase in vermin » Eutrophication of nearby water sources » Breeding ground for bacteria and viruses » Illness, viral infections » Soil pollution Groundwater and surface water pollution	» Septic tanks and portable toilets	5. Daily inspection of all portable toilets and septic tanks must be performed by SHE/ environmental representatives on site. 6. Upon the completion of decommissioning, the area must be cleared of potentially polluting materials. Spoil stockpiles must also be removed and appropriately disposed of or the material re-used for an appropriate purpose.		

APPENDIX 1

CV OF TARYN BIGWOOD

APPENDIX 2

METHOD STATEMENT TEMPLATE

CONTRACT: _____

DATE: _____

PROPOSED ACTIVITY (give title of method statement and reference number from the EMPR):

WHAT WORK IS TO BE UNDERTAKEN (give a brief description of the works):

WHERE ARE THE WORKS TO BE UNDERTAKEN (where possible, provide an annotated plan and a full description of the extent of the works):

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date: _____

End Date: _____

HOW ARE THE WORKS TO BE UNDERTAKEN (provide as much detail as possible, including annotated maps and plans where possible):

Note: *please give too much information rather than too little. Please ensure that issues such as emergency procedures, hydrocarbon management, wastewater management, access, individual responsibilities, materials, plant used, maintenance of plant, protection of natural features etc. are covered where relevant*

APPENDIX 3

EMPR FOR THE REDSTONE CSP PROJECT WITH ALL MANAGEMENT PLANS AS APPENDICES