ENVIRONMENTAL MANAGEMENT PROGRAMME

REVISION 1

for

GROOTFONTEIN ACCESS ROAD

on

Remainder and Portion 5 of the Farm Grootfontein number 149

In terms of the

National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended & Environmental Impact Regulations 2014

Prepared for Applicant: Grootfontein Access Road (Pty) Ltd

By: *Cape EAPrac*

Report Reference: BRV727/15

Department Reference: 6/3/3/1/B5/2/1025/23

Case Officer: Bernadette Osborne

Date: 2 May 2023

Cape EAPrac
Cape Environmental Assessment Practitioners

Tel: +27 44 874 0365 PO Box 2070, George 6530
Fax: +27 44 874 0432 17 Progress Street, George

www.cape-eaprac.co.za

APPOINTED ENVIRONMENTAL ASSESSMENT PRACTITIONER:

***Cape EAPrac* Environmental Assessment Practitioners**

PO Box 2070

George

6530

Tel: 044-874 0365

Fax: 044-874 0432

Report written & compiled by: **Dale Holder** (Nat.Diploma Nature Conservation) who has 15 years experience as an environmental practitioner with assistance by **Frede Benadé** (BSc. (Hons) Conservation Ecology).

PURPOSE OF THIS REPORT:

For implementation by EPC & O&M contractor

APPLICANT:

Grootfontein Access Road (Pty) Ltd

CAPE EAPRAC REFERENCE NO:

BRV727/15

DEPARTMENT REFERENCE:

6/3/3/1/B5/2/1025/23

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ENVIRONMENTAL MANAGEMENT PROGRAMME

in terms of the

National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended &
Environmental Impact Regulations 2010

Grootfontein Access Road

Remainder and Portion 5 of the Farm Grootfontein number 149

Submitted for:

Departmental Review

Report Issued by:

Cape Environmental Assessment Practitioners

Tel: 044 874 0365
Fax: 044 874 0432
Web: www.cape-eaprac.co.za

PO Box 2070
17 Progress Street
George 6530

ORDER OF REPORT

Environmental Management Programme - Legislated Requirements Checklist

Environmental Management Programme – Main Report

Appendix A: Site Development Plan.

ENVIRONMENTAL MANAGEMENT PROGRAMME LEGISLATIVE REQUIREMENTS

This EMP complies with the requirements of Regulation 982 in terms of the 2014 Environmental Regulations (as amended).

Compliance checklists in terms of these three requirements are included in table 2 below.

Appendix 4 of Regulation 982 of the 2014 EIA Regulations contains the required contents of an Environmental Management Programme (EMPr). The checklist below serves as a summary of how these requirements were incorporated into this EMPr.

Table 1: EMPr compliance with Appendix 4 of Regulation 982

Requirement	Description
Details of the EAP who prepared the EMPr; and; The expertise of the EAP to prepare an EMPr, including a curriculum vitae.	This EMPr was prepared by Dale Holder of Cape EAPrac who has more than 18 years' experience as an Environmental Assessment Practitioner. A company profile of Cape EAPrac as well as the CV of the EAP is attached to the BAR
A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description.	This EMP covers all aspects of the project as currently under assessment. • This includes the construction and operation of an access road to serve 3 authorised PV developments.
A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers	No specific sensitive features along the alignment were identified by participating specialists. All sensitive features in close proximity to the proposed access road are depicted on the Site Layout Plan Appended to this EMPR
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 the 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 of this EMPr.
A description and identification of impact management outcomes required for the aspects contemplated above.	Table 5 in section 2 of the EMPR
A description of the proposed impact management actions, identifying the way the impact management objectives and	Throughout the report. Summarised in Section 13 of the EMPr.

Requirement	Description
outcomes contemplated above will be achieved and must, where applicable include actions to – (i) Avoid, modify, remedy control or stop any action, activity or process which causes pollution or environmental degradation; (ii) Comply with any prescribed environmental management standards or practises; (iii) Comply with any applicable provisions of the Act regarding closure, where applicable; and (iv) Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable.	
The method of monitoring the implantation of the impact management actions contemplated above.	Section 8.
The frequency of monitoring the implementation of the impact management actions contemplated above.	Section 8.
An indication of the persons who will be responsible for the implementation of the impact management actions.	Figures 1 & 2 and Section 8
The time periods within which the impact management actions must be implemented.	Throughout the EMPr
The mechanism for monitoring compliance with the impact management actions.	Section 8
A program for reporting on compliance, considering the requirements as prescribed in the Regulations.	Section 8
An environmental awareness plan describing the way – (i) The applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment.	Section 4.2 and 4.3
Any specific information that may be required by the competent authority.	Please refer to the table above, where the competent authorities specifically required information is addressed.

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ABBREVIATIONS

AC	Alternating Current
Alt.	Alternative
BGIS	Biodiversity Geographic Information System
CARA	Conservation of Agricultural Resources Act (43 of 1983)

CBA	Critical Biodiversity Area
cctv	Closed Circuit Television (camera)
CDSM	Chief Directorate Surveys and Mapping
cm	Centimetre
DAFF	Department of Agriculture, Forestry & Fisheries
DEA	Department of Environmental Affairs (national)
DEA&DP	Department of Environmental Affairs & Development Planning (Western Cape)
DEIR	Draft Environmental Impact Report
DME	Department of Minerals and Energy
DoE	Department of Energy
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Impact Practitioner
ECA	Environmental Conservation Act (73 of 1989)
ECO	Environmental Control Officer
ECR	Environmental Control Report
EHS	Environmental, Health & Safety
EIA	Environmental Impact Assessment
EIP	Environmental Implementation Plan
EIR	Environmental Impact Report
ELC	Environmental Liaison Committee
ER	Engineer Representative
ESA	Environmental Site Agent / Ecological Support Area
EMPr	Environmental Management Programme
FPA	Fire Protection Association
GPS	Global Positioning System
ha	Hectare
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IPP	Independent Power Producer
ISO	International Organisation for Standardisation (ISO 9001)
Kl / Klt	Kilo Litre
Km	Kilometre
Km/h	Kilometres per hour
kV	Kilo Volt
LLRC	Low Level River Crossing
lt	Litre
LUDS	Land Use Decision Support
LUPO	Land Use Planning Ordinance
m	Metre
m²	Metres squared
m³	Metres cubed
MW	Mega Watt
NEMA	National Environmental Management Act (107 of 1998, as amended in 2006)
NEMBA	National Environmental Management: Biodiversity Act (10 of 2004)

NERSA	National Energy Regulator of South Africa
NFA	National Forest Act (84 of 1998)
NHRA	National Heritage Resources Act (25 of 1999)
No.	Number
NSBA	National Spatial Biodiversity Assessment
NVFFA	National Veld and Forest Fire Act (101 of 1998)
NWA	National Water Act (36 of 1998)
pH	Potential of Hydrogen
PIA	Paleontological Impact Assessment
PM	Post Meridiem; “Afternoon”
PV	Photovoltaic
PVC	Polyvinyl Chloride (piping)
REDs	Road Environmental Dust Suppressant
SAHRA	South African National Heritage Resources Agency
SANBI	South Africa National Biodiversity Institute
SANS	South Africa National Standards
SDF	Spatial Development Framework
S&EIR	Scoping & Environmental Impact Reporting
SAPD	South Africa Police Department
WULA	Water Use Licence Application

1. INTRODUCTION

Cape EAPrac has been appointed by the Applicant, Grootfontein Access Road (Pty) Ltd, as the independent **Environmental Assessment Practitioner** (EAP) responsible for compilation of the **Environmental Management Programme** (EMPr) for the proposed Grootfontein Access Road.

This EMPr is submitted in compliance with the National Environmental Management Act (NEMA, Act 107 of 1998, as amended) for the proposed development of the proposed Grootfontein Access Road.

The key purpose of this EMPr is to ensure that the remedial and mitigation requirements identified during the Basic Assessment process are implemented during the lifespan of the project (design to decommissioning). The EMPr is thus a management tool used to minimise and mitigate the potential environmental impacts, while maximising the benefits.

A detailed description of the proposed project and a description of the affected environment are provided in the Basic Assessment Report which should be referred to where necessary.

1.1. EMPr Approval & Revisions

This EMPr once authorised, becomes a legally binding document and contravention with this document constitutes a contravention with the Environmental Authorisation.

The supplementary plans annexed to this EMP must be read in conjunction with this EMPr and maintain the same legal status as the EMPr

The EMPr may however require amendment at certain stages through the lifespan of the project. The incidences which may require the amendment of this document include:

- Incorporation of conditions of approval contained in the Environmental Authorisation;
- Changes in environmental legislation;
- Results of post-construction monitoring and audit;
- Per instruction from the competent authority; and
- Changes in technology and best practice principles.

The relevant sections of this EMP have been updated to separately reflect the environmental outcomes and environmental actions.

Should amendment of any of the EMPr objectives be required, an application for this must be submitted to the competent authority and approved before such changes are implemented. Changes to the EMPr actions may be affected without the need for an amendment process, subject to approval by the ECO and future amendment as part of the first environmental audit report.

1.2. Contractual Obligation

This EMPr must be included in ALL tender and contract documentation associated with this project. It must be noted that this EMPr is relevant and binding not only on the activities associated with the construction of the access road.

For the Construction phase, the EPC Contractor (including any sub-contractors) must ensure that sufficient budget is allocated to the implementation of this EMPr until such time as final rehabilitation is completed.

For the operational phase, the O&M Contractor (including any sub-contractors) must ensure that sufficient budget is allocated to the Operational requirements in this EMPr

1.3. Organisational Requirements

In order to ensure effective implementation of the EMPr, it is necessary to identify and define the organisational structure for the implementation of this document.

The proposed organisational structure during **construction** is as follows:

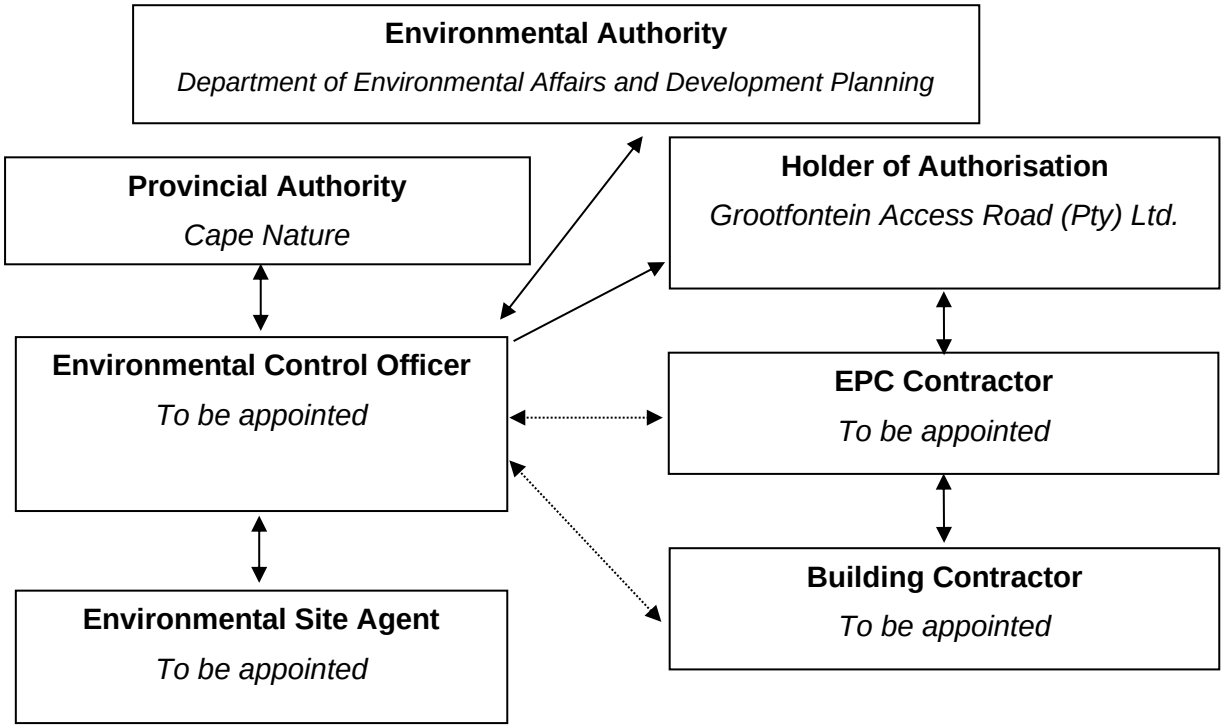

Figure 1: EMPr organisational structure during the construction phase

The proposed organisational structure during the **operation** of the facility is as follows:

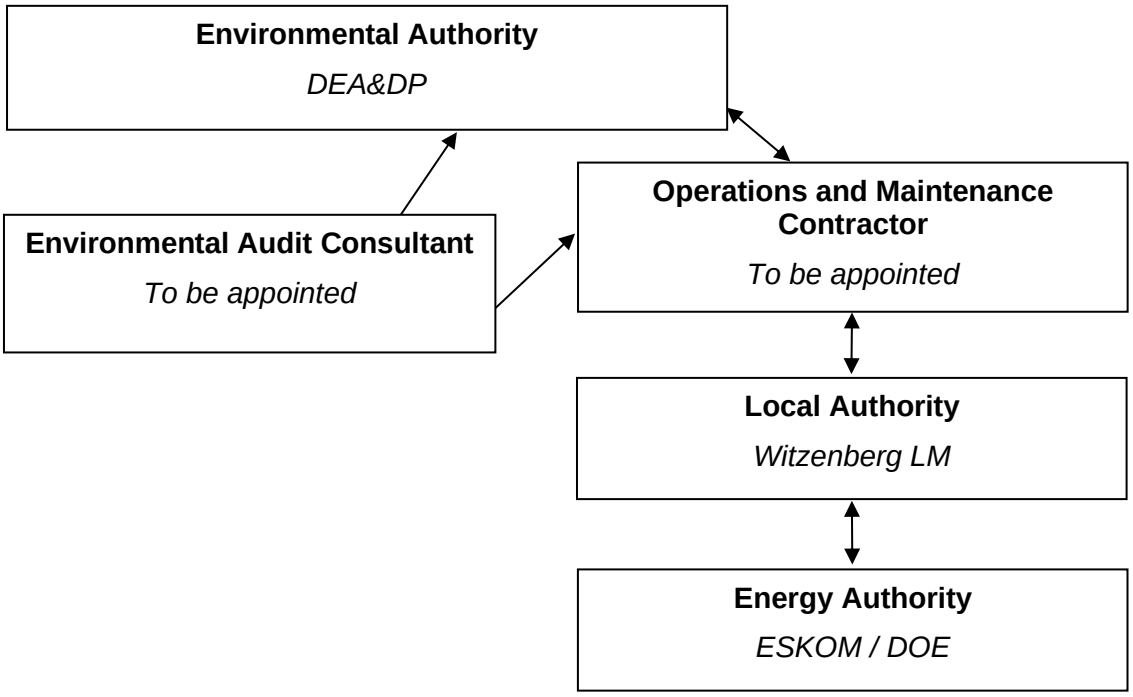

Figure 2: EMPr organisational structure during the operation phase.

This Organisational chart should be updated once the relevant parties are appointed in terms of this EMPr.

Details regarding the roles and responsibilities of the various parties in these organisational structures are included in Section 2 below.

1.4. Project Proposal

The applicant, Grootfontein Access Road (Pty) Ltd is proposing the construction of an integrated access road that will provide both construction and operational access to the Photovoltaic (PV) energy facilities authorised on Remainder and Portion 5 of the Farm Grootfontein number 149.

To date, the National Department of Environment, Forestry and Fisheries has been the competent authority on all the EIA applications for the Grootfontein PV Projects (PV Facilities, Substations and Grid Connection), copies of all previous authorisations on this property is attached in Appendix E of the Draft BAR

The proposed road would have a maximum width of 12m (inclusive of side drains and gravel embankments). The access road will be assessed as a 50m wide corridor to allow for micro-sighting during construction.

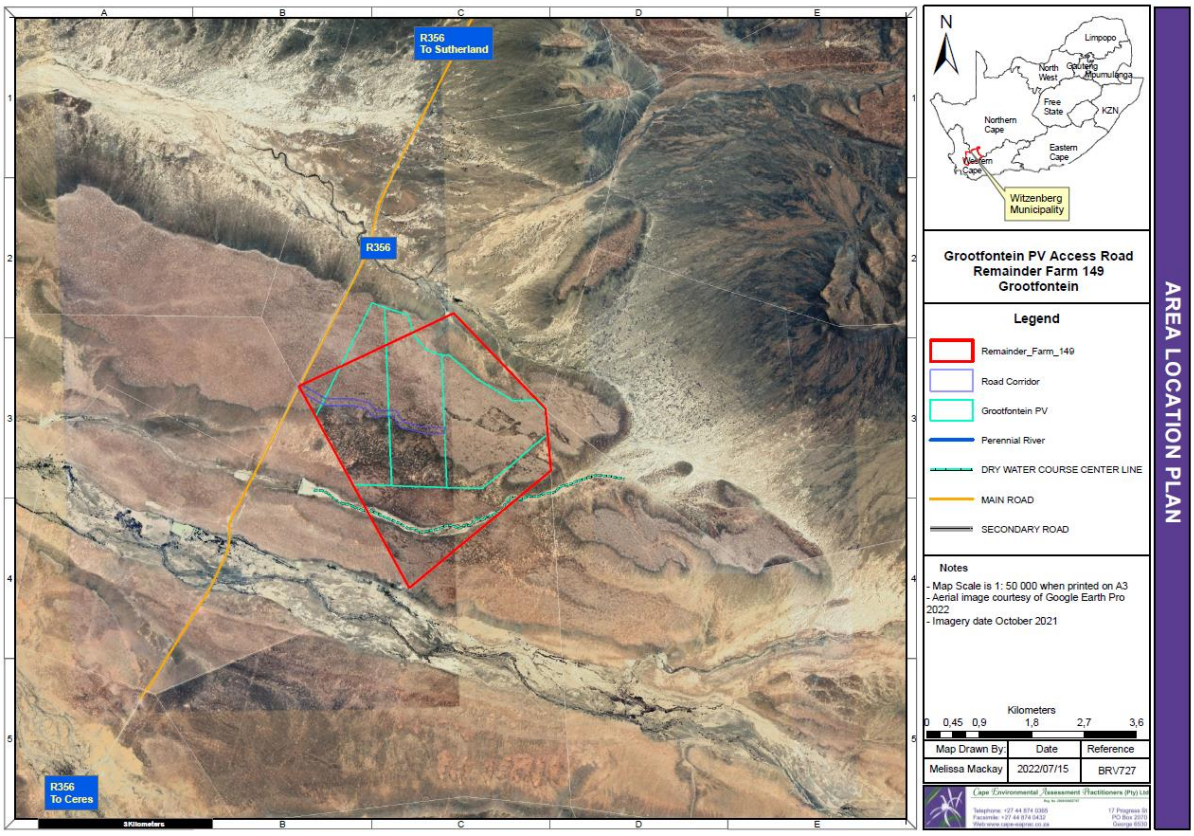

Figure 3: Location of Grootfontein Access Road

1.5. Approach to the EMPr

This EMPr addresses the environmental management of the four key phases of the project, namely:

- The design and pre-construction phase;
- The construction phase;
- The operation phase; and
- The closure and decommissioning phase.

These four phases can be generally categorised as follows.

1.5.1. Pre-construction Phase

The pre-construction phase of the development refers to the final layout design considerations and the site preparation.)

1.5.2. Construction Phase

The construction phase of the development refers to the earthworks and the actual construction of the civil works.

1.5.3. Operation Phase

The operational phase commences once the associated PV facilities starts providing power into the national grid (Contract Operational Date).

1.5.4. Closure and Decommissioning Phase

Closure and decommissioning refer the decommissioning of the associated PV Facility

2. ROLES AND RESPONSIBILITIES

Throughout the lifespan of this project, several individuals and entities will fulfil various roles and responsibilities to ensure the effective implementation of this EMPr. The key roles and responsibilities are detailed in the table below.

Table 2: Roles and responsibilities regarding the implementation of this EMPr.

Responsible Parties	Role and responsibilities
Department of Environmental Affairs and Development Planning..	Role The DEA&DP is the **competent / delegated authority** responsible for compliance with the relevant environmental legislation, namely the National Environmental Management Act and other Specific Environmental Management Acts (SEMA's) Responsibilities • Ensure overall compliance with the Environmental Authorisation (EA) & EMPr. • Review this document and any revisions thereof. • Undertake site audits at their discretion. • Review ECO Reports. • Review Audit Reports • Review Incident Reports. Enforce legal mechanisms for contraventions of this EMPr and EA.
Holder of the Authorisation – Grootfontein Access Road (Pty) Ltd.	Role The holder of the Authorisation is ultimately responsible and legally liable for ensuring compliance with all statutory requirements relating to the Solar facility. Responsibilities • Ensuring compliance with the conditions set out in the Environmental Authorisation issued in terms of the NEMA, as well as those prescribed by other relevant legislation and guidelines. • Compliance with the requirements set out in this EMPr. Ensuring all other permits, permissions and licences from all other statutory departments are in place.
Environmental Control Officer (ECO) – To be appointed	Role The ECO fulfils an advisory role to monitor, guide and report compliance with the EMPr.

	Responsibilities • Revise, update and amend the EMPr if necessary and submit the amendments to the competent authority for consideration. • Ensure all relevant persons have a copy of the EMPr and any amendments thereof. • Advise the employer's representative on any additional environmental authorisations and permits that may be required. • Facilitate the Environmental Education / Induction Training with the contract staff. • Review and comment on Method Statements relevant to environmental management and make recommendations to the employer's representative. • Report any non-compliance with the EMPr or EA to the employer's representative and competent authority if necessary. • Undertake regular site inspections in compliance with this EMPr. • Monitor, audit and verify that all works comply with the EA and the EMPr. • Keep record of EMPr implementation, monitoring and audits, including a full photographic record of works. • Comply and submit regular Environmental Control Reports to the competent authority, as well as employer's representative &/ holder of the authorisation. Report any environmental incidents or environmental impacts immediately to the employer's representative and the competent authority if necessary. • Report any environmental incidents or environmental impacts immediately to the employer's representative and the competent authority if necessary. • Assist the contractor and employer's representative planning for and implementing environmentally sensitive problem solving. Advise the employer's representative on suggested "stop work" orders.
Environmental Site Agent (ESA) – To be appointed	Role To assist the ECO with the day to day implementation and monitoring of the environmental management actions that are taking place on site. Responsibilities • Day to day environmental control of contractors on site during the construction phase. • Monitoring of construction management activities during the construction phase. Weekly reporting to the ECO.
Employers Representative – To be appointed	Role The Employer's representative role is likely to be fulfilled by the **project engineer /project engineer** and assumes overall delegated responsibility for compliance with this EMPr, the EA, the conditions of the Planning Approval, Conditions of the WULA and all applicable legislation for the duration of the construction phase. Responsibilities • Issue site instructions to the contractor based on the advice of the ECO. • Ensure that all detailed design incorporates the requirements of the EMPr and EA. • Ensure that the EMPr is included in all tender documents issued to prospective contractors and sub-contractors.

	• Ensure the EMPr is included in final contract documents. • Ensure that the Tenderers/Contractors adequately provide for compliance with the EMPr in their submissions. • Ensure that the EMPr is fully implemented by the relevant persons. • Ensure the contractor provides the necessary method statements. • Be accountable, to the competent authority for any contravention or non-compliance by the Contractor. • Assist the contractor with input from the ECO in finding environmentally responsible solutions to problems. • Undertake regular site audits, site visits and inspections to ensure that the requirements of the EMPr are implemented • Give instructions on any procedures and corrective actions on advice from the ECO. • Report environmental incidents or non-compliance with the EA or EMPr to the environmental authority. Issue spot fines, penalties or 'stop-work' orders for contravention of the EMPr and give instructions regarding corrective action.
Landowner	Role The landowner is responsible for compliance with legislation applicable to the management of the remainder of the property. Responsibilities E.g.: In terms of the National Veld & Forest Fires Act (101 of 1998) - an owner on whose land is subject to a risk of veldfire or whose land or part of it coincides with the border of the Republic, must prepare and maintain a firebreak on his or her land as close as possible to the border.

3. LEGISLATIVE FRAMEWORK

Several pieces of legislation were considered during the development of this EMPr. The holder of the EA must ensure compliance with all relevant legislation including those detailed below and any others that may be relevant to the works to be undertaken.

3.1. The Constitution of the Republic of South Africa

The Constitution of the Republic of South Africa (Act 108 of 1996) states that everyone has a right to a non-threatening environment and that reasonable measures are applied to protect the environment. This includes preventing pollution and promoting conservation and environmentally sustainable development, while promoting justifiable social and economic development.

3.2. National Environmental Management Act (NEMA, Act 107 of 1998, as amended)

The National Environmental Management Act (NEMA, Act 107 of 1998, as amended), makes provision for the identification and assessment of activities that are potentially detrimental to the environment and which require authorisation from the competent authority (in this case, the national Department of Environmental Affairs) based on the findings of an Environmental Impact Assessment (EIA). It also embraces the notion of sustainable development as contained in the Constitution of South Africa (Act 108 of 1996) in that everyone has the right:

- to an environment that is not harmful to their health or well-being; and
- to have the environment protected for the benefit of present and future generations through reasonable legislative and other measures.

NEMA requires that measures are taken that "*prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development*." In addition:

- That the disturbance of ecosystems and loss of biological diversity are avoided, or where they cannot be altogether avoided, are minimised and remedied;
- That a risk-averse and cautious approach is applied, which considers the limits of current knowledge about the consequences of decisions and actions; and
- Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.

NEMA aims to provide for co-operative environmental governance by establishing principles for decision-making on all matters relating to the environment and by means of Environmental Implementation Plans (EIP) and Environmental Management Programmes (EMPr).

The Applicant may not undertake activities listed in terms of the NEMA without prior authorisation.

In compliance with **Section 24N** of NEMA, this EMPr must contain the following (over and above the content requirements listed in the Table 1 above):

Table 3: Compliance with Section 24N of NEMA

EMPr Provision	Report Reference
Information on any proposed management, mitigation, protection or remedial measures that will be undertaken to address the environmental impacts that have been identified in a report contemplated in subsection 24(1A), including environmental impacts in respect of **planning & design.**	This is addressed in **Sections 4,**
Information on any proposed management, mitigation, protection or remedial measures that will be undertaken to address the environmental impacts that have been identified in a report contemplated in subsection 24(1A), including environmental impacts in respect of **pre-construction and construction activities.**	This is addressed in **Sections 4**.
Information on any proposed management, mitigation, protection or remedial measures that will be undertaken to address the environmental impacts that have been identified in a report contemplated in subsection 24(1A), including environmental impacts in respect of the **operation** or **undertaking** the activity in question.	This is addressed in **Sections 6**
Information on any proposed management, mitigation, protection or remedial measures that will be undertaken to address the environmental impacts that have been identified in a report contemplated in subsection 24(1A), including environmental impacts in respect of the **rehabilitation** of the environment.	This is addressed in **Section 6 & 7** of this EMPr – It has also been dealt with under construction requirements for the specific reason that these works must take place during the construction phase.
Information on any proposed management, mitigation, protection or remedial measures that will be undertaken to address the environmental impacts that have been identified in a report contemplated in subsection 24(1A), including environmental impacts in respect of **closure**, if applicable	This is dealt with in **Section 7** of the EMPr.
Details and **expertise** of the person who prepared the EMPr.	These details are included at the beginning of the report (after cover page and report conditions).
A detailed description of the **aspects** of the activity that are covered by the EMPr.	This is dealt with under the introduction in **Section 1,** this EMPr.
Information identifying the persons who will be **responsible** for the implementation of the measures addressed in the EMPr.	This is dealt with in **Section 2,** of this EMPr.
Information in respect of mechanisms proposed for **monitoring** compliance with the EMPr and for **reporting** on the compliance.	This is dealt with in **Section 8** of this EMPr.
Measures to **rehabilitate** the affected environment.	This is dealt with in **Sections 5 & 6** of this EMPr as well as in appendix D-G.
Description of the manner in which **pollution** will be **prevented** and remedied.	This is dealt with throughout the EMPr, but specifically in **Sections 5 & 7**
The EMPR must furthermore, where appropriate;	
Set out **time periods** within which measures must be implemented.	This is dealt with in **throughout** of the EMPr and summarised in section 13.
Contain measures regulating responsibilities for any environmental damage.	This is dealt with is **14** of this EMPr.

EMPr Provision	Report Reference
Develop an **environmental awareness plan** describing the way the applicant intends to inform his or her Employees of any environmental risks and how to deal with these risks in order to avoid pollution or degradation of the environment.	This is dealt with in **Sections 4.3 & 4.4** of the EMPr.

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n addition to the above, the Holder of the Authorisation is bound by "Duty of Care", as described in Section 28 of NEMA (107 of 1998, as amended), which "…*obliges every person who causes, has caused or may cause significant environmental degradation to take reasonable measures to prevent such degradation from occurring, continuing or recurring*". Thus, all mitigation measures recommended by the relevant authorities and specialists must be implemented to avoid occurrence, continuation or repeat of environmental degradation.

3.3. National Environmental Management: Biodiversity Act (NEMBA) (Act 10 of 2004)

The National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA) provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. The Draft National List of Threatened Ecosystems (Notice 1477 of 2009, Government Gazette No 32689, 6 November 2009) has been gazetted for public comment.

The list of threatened terrestrial ecosystems supersedes the information regarding terrestrial ecosystem status in the NSBA 2004. In terms of the EIA regulations, a basic assessment report is required for the transformation or removal of indigenous vegetation in a critically endangered or endangered ecosystem regardless of the extent of transformation that will occur. **However, all the vegetation types on the property are classified as Least Threatened.** Please see the **ecological impact assessment** attached in **Annexure G3** in the BAR for further information.

NEMBA also deals with endangered, threatened and otherwise controlled species. The Act provides for listing of species as threatened or protected, under one of the following categories:

- **Critically Endangered**: any indigenous species facing an extremely high risk of extinction in the wild in the immediate future.
- **Endangered**: any indigenous species facing a high risk of extinction in the wild in the near future, although it is not a critically endangered species.
- **Vulnerable**: any indigenous species facing an extremely high risk of extinction in the wild in the medium-term future; although it is not a critically endangered species or an endangered species.
- **Protected species**: any species which is of such high conservation value or national importance that it requires national protection. Species listed in this category include, among others, species listed in terms of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Certain activities, known as Restricted Activities, are regulated by a set of permit regulations published under the Act. These activities may not proceed without environmental authorization.

3.4. National Forests Act (NFA) (No. 84 of 1998):

The National Forests Act provides for the protection of forests as well as specific tree species, quoting directly from the Act: "*no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a licence or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated".*

No NFA protected species are present on the property.

3.5. National Veld & Forest Fire Act (NVFFA) (Act 101 of 1998)

The purpose of the National Veld and Forest Fire Act is to **prevent and combat veld, forest and mountain fires** throughout the Republic of South Africa and to provide institutions, methods and practices for achieving this purpose. Institutions include the formation bodies such as **Fire Protection Associations** (FPA's) and Working on Fire. The Act provides the guidelines and constitution for the implementation of these institutions, as well as their functions and requirements.

Every owner on whose land a veldfire may start or bum or from whose land it may spread must prepare and **maintain a firebreak on his or her side of the boundary between his or her land and any adjoining land.** The procedure in this regard and the role of adjoining owners and the fire protection association are dealt with within this Act. An owner on whose land is subject to a risk of veldfire or whose land or part of it coincides with the border of the Republic, must prepare and maintain a firebreak on his or her land as close as possible to the border.

The access road itself will likely constitute a suitable fire break in this regard. No additional fire breaks may be constructed in respect of this access road.

3.6. Conservation of Agricultural Resources Act – CARA (Act 43 of 1983):

CARA provides for the regulation of control over the utilisation of the natural agricultural resources in order to promote the conservation of soil, water and vegetation and provides for combating weeds and invader plant species. The Conservation of Agricultural Resources Act defines different categories of alien plants:

- Category 1 - prohibited and must be controlled;
- Category 2 – must be grown within a demarcated area under permit; and
- Category 3 - ornamental plants that may no longer be planted, but existing plants may remain provided that all reasonable steps are taken to prevent the spreading thereof, except within the flood lines of water courses and wetlands.

The abundance of alien plant species along the Grootfontein Access road is very low, which can be ascribed firstly to the aridity of the site.

3.7. National Heritage Resources Act (NHRA) (Act 25 of 1999)

The protection and management of South Africa's heritage resources are controlled by the National Heritage Resources Act (Act No. 25 of 1999). Heritage Western Cape, and is registered as a Stakeholder for this environmental process.

In terms of Section 38 of the National Heritage Resources Act, SAHRA will comment on the detailed Heritage Impact Assessment (HIA) where certain categories of development are proposed. Section 38(8) also makes provision for the assessment of heritage impacts as part of an EIA process.

The National Heritage Resources Act requires relevant authorities to be notified regarding this proposed development, as the following activities are relevant:

- *the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
- *any development or other activity which will change the character of a site exceeding 5 000 m² in extent;*
- *the re-zoning of a site exceeding 10 000m^2 in extent.*

Furthermore, in terms of Section 34(1), no person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit issued by the SAHRA, or the responsible resources authority.

Nor may anyone destroy, damage, alter, exhume or remove from its original position, or otherwise disturb, any grave or burial ground older than 60 years, which is situated outside a formal cemetery administered by a local authority, without a permit issued by the SAHRA, or a provincial heritage authority, in terms of Section 36 (3).

In terms of Section 35 (4), no person may destroy, damage, excavate, alter or remove from its original position, or collect, any archaeological material or object, without a permit issued by the SAHRA, or the responsible resources authority.

The EPC contractor will have to ensure compliance with the SAHRA approval, once authorised.

3.8. National Water Act (NWA), NO 36 OF 1998

Water use in South Africa is controlled by the NWA and the enforcing authority is the DWS. The NWA recognises that water is a scarce and unevenly distributed national resource in South Africa. Its provisions are aimed at achieving sustainable and equitable use of water to the benefit of all users and to ensure protection of the aquatic ecosystems associated with South Africa's water resources. The provisions of the Act are aimed at discouraging pollution and waste of water resources.

In terms of the Act, a land user, occupier or owner of land whereon which an activity that causes, or has the potential to cause pollution of a water resource, has a duty to take measures to prevent pollution from occurring. If these measures are not taken, the responsible authority may do whatever is necessary to prevent the pollution or remedy its effects, and to recover all reasonable costs from the responsible person.

Section 21 of the NWA specifies a number of water uses, including taking water from a water resource, the storing of water, impeding or diverting the flow of water in a watercourse, discharging waste or water containing waste into a water resource through a pipe, canal,

sewer, sea outfall or other conduit, disposing of waste in a manner which may detrimentally impact on a water resource, disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process, discharging water from underground for the safety of people, and altering the bed, banks, course or characteristics of a watercourse. These Water uses requires licencing in terms of Section 22 (1) of the Act, unless it is listed in Schedule 1 of the NWA, is an existing lawful use, the water use falls under a General Authorisation issued under Section 39 of the Act, or if the responsible authority waives the need for a licence.

3.9. ASTRONOMY GEOGRAPHIC ADVANTAGE ACT, 2007 (ACT NO 21 OF 2007)

The purpose of the Act is to preserve the geographic advantage areas that attract investment in astronomy. The entire Northern Cape Province, excluding the Tsantsabane Municipality, has been declared an astronomy advantage area. The Northern Cape optical and radio telescope sites were declared core astronomy advantage areas. The Act allowed for the declaration of the Southern Africa Large Telescope (SALT), Meerkat and Square Kilometre Array (SKA) as astronomy and related scientific endeavours that must be protected.

The proposed Grootfontein Access Road is not in the Northern Cape nor within an AGGA.

3.10. Guidelines & Strategic Documents

The following guidelines and strategic documents were considered during the compilation of this EMPr.

3.10.1. National Waste Management Strategy

The National Waste Management Strategy presents the South African government's strategy for integrated waste management for South Africa. It deals among others with: Integrated Waste Management Planning, Waste Information Systems, Waste Minimisation, Recycling, Waste Collection and Transportation, Waste Treatment, Waste Disposal and Implementing Instruments.

3.10.2. Waste Minimisation Guideline Document for Environmental Impact Assessment Review (May 2003)

This guideline, although compiled on a provincial level, was considered pertinent to this EMPr. This Guideline raises awareness to waste minimisation issues and highlights waste and wastage minimization practices. Part B of this document is of importance, as it addresses issues of general waste and wastage minimization during construction activities.

3.10.3. National Building Regulations

The National Building Regulations and Building Standards Act as amended must be complied with. This act addresses, inter alia:

- Specifications for draftsmen, plans, documents and diagrams;
- Approval by local authorities;
- Appeal procedures;
- Prohibition or conditions with regard to erection of buildings in certain conditions;
- Demolition of buildings;
- Access to building control officers;
- Regulations and directives; and

- Liability.

3.10.4. Other Guidelines considered 3.11.4

In addition to those described above, the following guidelines were also considered during the compilation of this EMPr.

- DEADP (2003). Waste Minimisation Guideline for Environmental Impact Assessment reviews. NEMA EIA Regulations Guideline & Information Series, Department Environmental Affairs & Development Planning.
- DEAT (2004). Environmental Management Plans, Integrated Environmental management, Information Series 12, Department Environmental Affairs & Tourism
- DEADP (2010). Guideline for Environmental Management Plans. NEMA EIA Regulations Guideline & Information Document Series, Department of Environmental Affairs & Development Planning.

4. DESIGN & PRE-CONSTRUCTION PHASE

No pre construction environmental requirements have been identified for the proposed Grootfontein Access Road. The Pre Construction requirements identified in the EMPr's for the greater facilities must however be adopted and implemented.

4 CONSTRUCTION PHASE ENVIRONMENTAL MANAGEMENT

The items contained in this section of the EMPr must be implemented during the construction phase of the proposed Grootfontein Access Road.

4.5 Water Supply

OUTCOME: To ensure water used during construction is lawfully and sustainably utilised.

The contractor must ensure a supply of water is available on site for sanitation, drinking, dust suppression etc.

Water used for dust suppression on gravel roads must be of a quality compliant with the General Special Effluent Standards (31/03/2009): Temperature: max.25^{0}C, pH: between 5.5 & 7.5 and conductivity: not be increased more than 15% above the intake water & not exceed 250 milli-Siemens per metre (determined at 25^{0}C). The water used for dust suppression is likely to be borehole water / municipal water, and not treated effluent. This item is specific to water supply during the construction phase. Water supply for the washing of panels is discussed under the operational phase requirements.

4.6 Topsoil Handling

OUTCOME: To ensure that the handling of topsoil does not result in the pollution or loss of the resource.

In terms of best practice and for rehabilitation purposes, it is essential that a 150mm layer of topsoil from the road footprint be stripped and stockpiled in one of the PV Laydown areas. .

Topsoil is of utmost importance for use in rehabilitation of disturbed areas and should therefore under no circumstances be mixed with sub-soils. .

The following actions regarding topsoil handling must be considered:

- A minimum 150mm layer of topsoil from the roads,
- The topsoil stockpile site must be approved by the ECO and must be within one of the authorised laydown areas for the PV projects;
- The topsoil may not be stockpiled within any of the remaining natural areas;
- The topsoil stockpile must be protected from erosion and dust as indicated by the ECO and this EMPr; and
- The topsoil must be replaced into disturbed areas on the road and PV project sites (road verges, cable trenches and contractors site camp) on completion of construction.
- The topsoil stockpile mustn't be deeper than 1m.
- A minimum buffer area of 20m should be around the topsoil stockpile in which no work may take place.
- The topsoil stockpile must be barricaded to inhibit unwanted vehicle movement around it.
- Topsoil must be moved once when stockpiling and back to disturbed areas during rehabilitation, no double handling.
-

4.7 Concrete Management

OUTCOME: To ensure that the handling of concrete does not result in pollution of soil or water resources.

Proper concrete management is of utmost importance. Concrete works are likely to be limited to the construction any stormwater management structures, and are not likely to be extensive (the preferred alternative for the panel support structures will make use of a technology that does not require concrete footings, due to rammed piles/earth screws/rock anchors). However, in instances where rammed piles/earth screws or rock anchors will not practically possible and for other concrete work associated with the substation and inverter stations, the following requirements in terms of concrete management should take place.

Cement powder has a high alkaline pH that may contaminate and adversely affect both soil pH and water pH negatively. A rapid change in pH can have consequences on the functioning of soil and water organisms, as well as on the botanical component.

The use of ready-mix trucks delivering concrete directly to site is recommended. Mass batching of concrete on site should be limited as far as possible.

The following actions must be implemented regarding the delivery of concrete to site:

- Trucks should deliver pre-mixed concrete to the site and pour the concrete directly into the prepared excavations.
- When concrete trucks have unloaded, there is a requirement to wash out the inside of the concrete drum. Water can be provided to the trucks for this purpose (at the discretion of the contractor). Concrete suppliers may **NOT** dispose of this wash water anywhere on site. Trucks should return to their depot for this purpose; and

Any spillages of concrete outside of the excavations (including haulage routes) must be cleaned up immediately by the supplier.

- If the wash water must be dumped on site, a proper evaporation pit could be built. This would be an excavated hole lined with impermeable plastic with hard barricading and netting to keep birds and animals from using it as a source of water. At the end of the project the material will be carted off-site, the hole will be filled with excavated material and topsoil placed on top.

4.8 Cable Trenches

OUTCOME: To ensure that trenching activities are restricted and do not result in loss of topsoil resources.

- No cable trenching is likely to take place as part of the access road construction.

4.9 Management of archaeological resources

OUTCOME: To ensure that works do not result in significant loss of archaeological resources.

Should any archaeological and/or paleontological remains, including (but not limited to) fossil bones, fossil shells, coins, indigenous ceramics, colonial ceramics, marine shell heaps, stone artefacts, bone remains, rock art, rock engravings and any antiquity be discovered during construction, the ECO should safeguard these (preferably *in situ*) and report the find immediately to the South African Heritage Resources Council (SAHRA) and Heritage Western Cape, so that they are not disturbed further until the necessary guidance and approval have

been obtained and the appropriate action (*e.g.* recording, sampling or collection) can be taken by a professional archaeologist or palaeontologist.

4.10 Noise Management

OUTCOME: To ensure nuisance from noise and vibration does not occur.

Although the proposed development is located outside of an urban area, the following noise management actions are applicable to the construction phase of the Grootfontein Access Road to its proximity to agricultural activities and potential future tourism activities proposed by the landowner.

- It is recommended that noise generation be kept to a minimum and that construction activities be confined to normal working hours (08:00 - 17:00 on workdays). Should the Contractor / Engineer wish to deviate from these work hours, this must be discussed during the Pre-Construction / Initial Environmental Compliance Workshop with the ECO and recorded in the necessary Method Statements;
- Provide baffle and noise screens on noisy machines as necessary;
- Provide absorptive linings to the interior of engine compartments;
- Ensure machinery is properly maintained (fasten loose panels, replace defective silencers);
- Switch off machinery immediately when not in use; and
- Reduce impact noise by careful handling.

The Contractor shall be responsible for compliance with the relevant legislation with respect to noise *inter alia* Section 25 of ECA (73 of 1989) and standards applicable to noise nuisances in the Occupational Health and Safety Act (No. 85 of 1993).

4.11 Dust Control & Management

OUTCOME: To ensure there is no health risk or loss of amenity due to emission of dust to the environment.

Every effort to minimize dust pollution on the site must be undertaken. The contractor must implement the following measures with regards to the management of dust on site:

The most important dust control measure is achieved by maintaining as much of the vegetative cover as possible. The following actions are suggested in this regard:.

- Construction vehicles must adhere to speed limits and minimization of haul roads must be implemented;
- During dry, dusty periods haul roads should be kept dampened to prevent excess dust. No potable water may be used for damping haul roads;
- All vehicles used to deliver or remove loose material (sand, soil, gravel etc.) to and from site must be covered with a 60% shade cloth to avoid dust blowing from the vehicle.
- As an alternative, products such as Road Environment Dust Suppressants (REDS) is recommended in order to minimize the use of water to control dust pollution. This is to be determined by the ECO during construction as required; and
- Exposed stockpile materials must be adequately protected against wind (covered) and should be sited in consideration of the prevailing wind conditions.

Apart from those actions detailed above, the following additional measures must be implemented:

- Dust nuisances shall comply with the applicable standards according to the Occupational Health and Safety (Act No. 85 of 1993). The contractor shall be solely responsible for the control of dust arising from the contractor's operations and for any costs against the Employer for damages resulting from dust;
- The contractor shall take all reasonable measures to minimise the generation of dust as a result of construction activities to the satisfaction of the Engineer's Representative (ER);
- Removal of vegetation shall be avoided until such time as soil stripping is required and similarly exposed surfaces shall be re-vegetated or stabilised as soon as is practically possible;
- Excavation, handling and transport of erodible materials shall be avoided under high wind conditions or when a visible dust plume is present;
- During high wind conditions the site manager, with input from the ECO, must evaluate the situation and make recommendations as to whether dust damping measures are adequate, or whether work should cease altogether until the wind speed drops to an acceptable level.
- Where possible, soil stockpiles shall be in sheltered areas where they are not exposed to the erosive effects of the wind. Where erosion of stockpiles becomes a problem, erosion control measures shall be implemented at the discretion of the site manager.
- Vehicle speeds shall not exceed 40km/h along dust roads or 20km/h when traversing unconsolidated and non-vegetated areas.
- Appropriate dust suppression measures shall be used when dust generation is unavoidable, e.g. dampening with water or use of REDS, particularly during prolonged periods of dry weather in summer. Such measures shall also include the use of temporary stabilising measures (e.g. chemical soil binders, straw, brush packs, clipping etc.).
- Should waterwater be used for dust suppression on gravel roads, it must be of a quality compliant with the General Special Effluent Standards (31/03/2009): Temperature: max.25^{0}C, pH: between 5.5 & 7.5 and conductivity: not be increased more than 15% above the intake water & not exceed 250 milli-Siemens per metre (determined at 25^{0}C). The water used for dust suppression must be sourced from a licenced resource.
- Dust monitoring must be done 2 months prior to construction to get a baseline and continue during construction.

4.12 Blasting

OUTCOME: To ensure any unlikely blasting activities do not disturb sensitive environmental nor social features

It is highly unlikely that blasting will be required. Should blasting be required for whatever reasons, the following actions must be implemented:

- No blasting may take place within 50m of a borehole without approval of a suitably qualified engineering geologist. Preventative mitigation actions could include installing PVC casing and screens in potentially affected boreholes before blasting, while damaged boreholes will have to be re-drilled (this scenario is however highly unlikely, as blasting will probably not take place);
- A current and valid authorisation shall be obtained from the relevant authorities and copied to the ER prior to any blasting activity;
- A method statement shall be required for any blasting related activities;

- All laws and regulations applicable to blasting activities shall be adhered to at all times;
- A qualified and registered blaster shall supervise all blasting and rock splitting operations at all times;
- The contractor shall ensure that appropriate pre-blast monitoring records are in place (i.e. photographic and inspection records of structures in close proximity to the blast area);
- The contractor shall allow for good quality vibration monitoring equipment and record keeping on site at all times during blasting operations;
- The contractor shall ensure that emergency services are notified, in writing, a minimum of 24 hours prior to any blasting activities commencing on site;
- The contractor shall take necessary precautions to prevent damage to special features and the general environment, which includes the removal of fly-rock. Environmental damage caused by blasting / drilling shall be repaired at the contractor's expense to the satisfaction of the ER and the ECO;
- The contractor shall ensure that adequate warning is provided immediately prior to all blasting. All signals shall also be clearly given;
- The contractor shall use blast mats for cover material during blasting. Topsoil may not be used as blast cover;
- During demolition, the contractor shall ensure, where possible, that trees in the area are not damaged;
- Appropriate blast shaping techniques shall be employed to aid in the landscaping of blast areas, and a method statement to be approved by the ER, shall be required in this regard; and
- **At least one week prior to blasting, the relevant occupants/owners of surrounding land shall be notified by the contractor and any concerns addressed**. Buildings within the potential damaging zone of the blast shall be surveyed, preferably with the owner present and any cracks or latent defects pointed out and recorded either using photographs or video. Failing to do so shall render the contractor fully liable for any claim of whatsoever nature, which may arise. The contractor shall indemnify the employer in this regard.

4.13 Stormwater and Erosion Management

OUTCOME: To ensure that stormwater and wash water do not cause erosion or pollution of the receiving environment.

- The stormwater management plan for the greater PV facility and associated Infrastructure must be adopted and implemented.

4.14 Fire Management and Protection

OUTCOME: To reduce the risk of fire to infrastructure and environment.

As mentioned above in Section 3.6 above, it is the landowner's responsibility be sufficiently prepared to combat veld fires.

The development site is arid, with sparse vegetation cover and fires are not a natural phenomenon in the area. However, under exceptional circumstances, such as following years of very high rainfall, sufficient biomass may build up to carry fires.

The following actions must however be considered with regards to fire protection on site:

- Fires should **only be allowed within fire-safe demarcated areas** (preferably within the site camp);
- **No fuelwood collection** should be allowed on-site:
- The **total removal of all invasive alien vegetation** should take place in order to decrease the fire risk – Although there were few invasive plants identified during the environmental process, these may establish to a degree as a result of site disturbance.
- Cigarette butts may not be thrown in the veld but must be disposed of correctly. The contractor, with input from the ECO, must **designate smoking areas** (in compliance with the Tobacco Products Control Amendment Act 63 of 2008) with suitable receptacles for disposal;
- In case of an emergency, the **contact details of the local fire and emergency services** must be readily available;
- Contractors must ensure that **basic firefighting equipment and suitably qualified/experienced personal** are available on site at all times, as per the specifications defined by the health and safety representative / consultant;
- The fire risk on site is a point of discussion that must take place as part of the pre-construction compliance workshop and the environmental induction training prior to commencement of construction; and
- The contractor must also comply with the requirements of the Occupational Health and Safety Act with regards to fire protection.
- During site vegetation clearing, vegetation must not be packed into a couple of large heaps, this could lead to a fire hazard. Vegetation should rather be put into more frequent smaller heaps or broken down by a chipper.

4.15 Sanitation During Construction

OUTCOME: To ensure safe and healthy sanitation for construction staff without increasing pollution risk

Portable chemical ablution facilities must be made available for the use by construction staff for the duration of the construction period. The following actions must be implemented in this regard:

- Toilet and washing facilities must be available to the site personnel at all times;
- These facilities must be situated within the site camp and away from any washes or drainage lines;
- One toilet for every 15 personnel is required;
- The facilities must be serviced on a regular basis to prevent any overflow or spillage;
- The servicing contractor must dispose of the waste in an approved manner (e.g. via the municipal wastewater treatment system);
- The ECO must be provided with the service providers' details and the service schedule for the site;
- The toilets should be secured to ensure that they do not blow over in windy conditions;
- All toilet facilities must be removed from site on completion of the contract period, and;
- Should the construction period be interrupted by a builder's break, the toilets should be emptied prior to the break.

Sanitation during operation is discussed above under the design criteria in Section 4.7.

4.16 Fuel Storage

OUTCOME: To ensure lawful fuel storage that does not cause soil and water pollution.

The above ground storage of fuel is subject to authorization in terms of the National Environmental Management Act (NEMA EIA regulations) if more than 30m³ is stored on site at any one time.

Should a temporary storage of hazardous or toxic materials / liquids (chemicals, fuels, lubricants and oils) be required, the Contractor must ensure that he/she complies with legislation and that the following actions are in place:

- Temporary fuel storage must take place within the contractors site camp within one of the PV development sites in an area approved by the ECO;
- No storage of fuel may take place on any other portion of the site;
- All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up immediately in the appropriate manner, as related to the nature of the spill.
- Mobile fuel units used to refuel plant on site must make use of drip trays when refuelling;
- Storage facilities may not be located within 60m of the on-site drainage lines or where there is a potential for any spilled fuel to enter a watercourse or groundwater;
- Fuel storage facilities should be located on flat ground. No cut and fill should take place immediately on or adjacent to fuel storage areas;
- All storage tanks should be double lined and be ISO 9001 certified;
- All storage tanks must be enclosed by bund walls;
- Bund walls must be constructed to contain at least 110% of the total capacity of the storage tanks;
- Bund walls must be constructed of impermeable material or lined to ensure that petroleum products cannot escape;
- In the event that the bunded area is a pit that is dug and lined with plastic, adjustments must be made to allow for invertebrates to escape as the plastic doesn't provide any traction and become pitfall traps.
- A suitable material should be placed in the base of the bund walls to soak up any accidental spillages;
- The tanks should be locked and secured when not in use;
- Automatic shut-off nozzles are required on all dispensing units;
- Storage tanks should be drained within one week of completion of activities (only unused fuel can be used by the contractor on other work sites or returned to the supplier). If the construction program extends over the builder's shutdown, the contractor must ensure that storage tanks are emptied prior to this period;
- All storage tanks, containers and related equipment should be regularly maintained to ensure safe storage and dispensing of material. The Engineer is to sign off on the condition and integrity of the storage tanks;
- Defective hoses, valves and containment structures should be promptly repaired;
- Vehicle and equipment fuelling should be undertaken on a hard-impermeable surface, over drip pans or bund walls to ensure spilled fuel or toxic liquids is captured and cleaned up, and;

- The area must be totally rehabilitated on completion of the contract and all contaminated material must be carefully removed and disposed of at a licensed dumping site for that purpose.
- Spill kits must be made available on-site for the clean-up of spills.

4.17 Construction Waste Management

OUTCOME: To ensure the management of waste is both lawful and sustainable.

4.17.1 Litter management

Wind and scavenger proof bins must be installed at the Contractor Site Camp and must be emptied on a weekly basis.

4.17.2 Construction Rubble and Waste

All construction rubble must be disposed of at an approved site established and registered for this purpose (no construction rubble may be spoiled anywhere on site). A list must be compiled before construction of any existing building rubble on site to avoid disputes. NO construction rubble may be used as fill in landscaping or any other areas on site.

4.17.3 Scrap Metal

Recycling of scrap metal is recommended. Scrap metal must be disposed of off-site at suitable facilities (e.g. municipal dump registered for this purpose).

4.17.4 Hazardous Waste

All hazardous waste (including chemicals, bitumen, fuel, lubricants, oils, paints etc.) shall be disposed of at an approved / registered hazardous-waste landfill site. The Contractor shall provide disposal certificates to the ECO.

Used oil and grease must be removed from site to an approved used oil recycling company.

Under NO circumstances may any hazardous waste be spoiled on the site.

Major services and maintenance of construction and delivery vehicles should take place off-site.

Washing of construction and personal vehicles are strictly prohibited on site unless it is done on an impermeable surface that flows into an evaporation pit. The contents of the pit will then be carted off site at the end of the project.

4.18 Theft and Other Crime

OUTCOME: To ensure that activities on site do not increase the criminal activity of the area.

An increase in crime during the construction phase is often a concern. In the case of the Grootfontein Access Road, this is likely to be negligible due to the extremely remote nature of the site. Theft and other crime associated with construction sites is not only a concern for surrounding residents, but also the developer and the contractor. Considering this, contractors need to be proactive in order to curtail theft and crime on and resulting from the construction site. It is recommended that the contractor develop a **jobsite security plan** prior to commencement of construction. This jobsite security plan should consider protection of the construction site from both internal and external crime elements, as well as the protection of surrounding communities from internal crime elements. All incidents of theft or other crime should be reported the South African Police Service, no matter how seemingly insignificant.

A copy of the jobsite **security plan should be included in the first environmental control report to be submitted to the competent authority.**

It must be noted the **collection, hunting or harvesting of any plants or animals** at the site is **strictly forbidden**, and thus any person found undertaking any of these actions will be considered guilty of committing a crime. Any incidents of such crimes on nature must be reported to the ECO immediately.

4.19 Plant Rescue and Protection.

OUTCOME: To reduce the impact on protected and sensitive botanical features.

- The conditions contained in the Biodiversity permits granted by Cape Nature must be implemented.

4.20 Vegetation Clearing

OUTCOME: To ensure that vegetation is minimised and restricted to the development footprint.

The objective of mitigation for any development is to firstly avoid and minimise impacts where possible and where these cannot be completely avoided, to compensate for the negative impacts of the development on vegetation and animal habitats, and to maximise re-vegetation and rehabilitation of disturbed areas. Some loss of vegetation is an inevitable consequence of the construction of the Grootfontein Access Road. Development and vegetation clearing required for the road. could impact listed plant species, as well as high-biodiversity plant communities. Vegetation clearing will also lead to habitat loss for fauna and potentially the loss of sensitive faunal species, habitats and ecosystems.

The following actions apply to vegetation clearing activities for the solar facility:

- Vegetation clearing must be kept to a minimum, clearing only the vegetation that occurs on the surface of the road itself and any side drains.;
- Vegetation cleared / removed as part of the site clearing activities must be stockpiled for use during the re-vegetation and rehabilitation stage for brush-packing. The location of the vegetation stockpile can be in the same area as the topsoil stockpile (i.e. within one of the laydown areas for the authorised PV sites), as designated in consultation with the ECO;
    - During site vegetation clearing, vegetation must not be packed into a couple of large heaps, this could lead to a fire hazard. Vegetation should rather be put into more frequent smaller heaps or broken down by a chipper.
- Any vegetation clearing that needs to take place as part of maintenance activities (during construction and operation phases) should be done in an environmentally friendly manner, using the most effective methodology suited to the target species (only by manual clearing).

4.21 Animal Rescue & Protection

OUTCOME: To reduce the direct impact on animals affected by the construction activities.

Any animals (including snakes, tortoises and lizards) directly threatened by the clearing or construction activities should be removed to a safe location outside of the construction area by the ECO or other suitably qualified/experienced person.

All trenches and open excavations should be inspected daily (first thing in the morning) for any trapped fauna (particularly small mammals and reptiles). These should be removed to a safe location outside of the construction area by the ECO or other suitably qualified / experienced person.

4.22 Re-Vegetation & Habitat Restoration

OUTCOME: To restore habitat disturbed during construction activities.

The re-vegetation and habitat restoration plan must be developed and implemented.

Certain of the overarching principles and actions in this section are also contained in other sections of this EMPR. They have been reiterated here to ensure easy referencing.

4.22.1 Topsoil management

Effective topsoil management is a critical element of rehabilitation, particularly in arid and semi-arid areas where soil properties are a fundamental determinant of vegetation composition and abundance. Although some parts of the site consist of exposed bedrock, most parts of the site have at least some topsoil. Where any excavation or topsoil clearing is required, the topsoil should be stockpiled and later used to cover cleared and disturbed areas once construction activity has ceased. The following actions are required for effective topsoil management.

- Topsoil is the top-most layer (0-25cm) of the soil in undisturbed areas. This soil layer is important as it contains nutrients, organic matter, seeds, micro-organisms fungi and soil fauna. All these elements are necessary for soil processes such as nutrient cycling and the growth of new plants. The biologically active upper layer of the soil is fundamental in the maintenance of the entire ecosystem.
- Topsoil should be retained on site in order to be used for site rehabilitation. The correct handling of the topsoil is a key element to rehabilitation success. Firstly, it is important that the correct depth of topsoil is excavated. If the excavation is too deep, the topsoil will be mixed with sterile deeper soil, leading to reduction in nutrient levels and a decline in plant performance on the soil.
- Wherever possible, stripped topsoil should be placed directly onto an area being rehabilitated. This avoids stockpiling and double handling of the soil. Topsoil placed directly onto rehabilitation areas contains viable seed, nutrients and microbes that allow it to revegetate more rapidly than topsoil that has been in stockpile for long periods.
- If direct transfer is not possible, the topsoil should be stored separately from other soil heaps until construction in an area is complete. The soil should not be stored for a long time and should be used as soon as possible. The longer the topsoil is stored, the more seeds, micro-organisms and soil biota are killed.
- Ideally stored topsoil should be used within a month and should not be stored for longer than three months. In addition, topsoil stores should not be too deep, a maximum depth of 1m is recommended to avoid compaction and the development of anaerobic conditions within the soil.

- Topsoil stockpiles should be placed away from any continuous work or movement and should be hard barricaded to avoid unnecessary trampling. A 20m buffer from other work would be ideal.

4.22.2 Mulching

Mulching is the covering of the soil with a layer of organic matter of leaves, twigs bark or wood chips, usually chopped quite finely. The main purpose of mulching is to protect and cover the soil surface as well as serve as a source of seed for revegetation purposes.

- During site clearing the standing woody vegetation should not be cleared and burned, removed or mixed with the soil, but should be cleared separately. The cleared vegetation should be stockpiled and used whole or shredded by hand or machine to protect the soil in disturbed areas and promote the return of indigenous species. Where there is a low shrub or grass layer, this material can be cleared and mixed as part of the topsoil as this will aid revegetation and recovery when it is reapplied.
- Mulch should be harvested from areas that are to be denuded of vegetation during construction activities, provided that they are free of seed-bearing alien invasive plants;
- No harvesting of vegetation may be done outside the area to be disturbed by construction activities;
- Brush-cut mulch should be stored for as short a period as possible, and seed released from stockpiles can also be collected for use in the rehabilitation process.

4.22.3 Seeding

In some areas the natural regeneration of the vegetation may be poor and the application of seed to enhance vegetation recovery may be required. Seed should be collected from plants present at the site and should be used immediately or stored appropriately and used at the start of the following wet season. Seed can be broadcast onto the soil, but should preferably be applied in conjunction with measures to improve seedling survival such as scarification of the soil surface or simultaneous application of mulch.

- Indigenous seeds may be harvested for purposes of re-vegetation in areas that are free of alien or invasive vegetation, either at the site prior to clearance or from suitable neighbouring sites;
- Seed may be harvested by hand and if necessary dried or treated appropriately
- Seed gathered by vacuum harvester, or other approved mass collection method, from suitable shrubs or from the plant litter surrounding the shrubs must be kept apart from individually harvested seed;
- No seed of alien or foreign species should be used or brought onto the site.

4.22.4 Transplants

Where succulent plants are available or other species which may survive translocation are present, individual plants can be dug out from areas about to be cleared and planted into areas which require revegetation. This can be an effective means of establishing indigenous species quickly, this is however unlikely to be a viable option at the current site as there are few suitable species present, but if the conditions are wet then most species have some probability of surviving.

Plants for transplant should only be removed from areas that are going to be cleared.

- Perennial grasses, shrubs, succulents and geophytes are all potentially suitable candidates for transplant.
- Transplants should be placed within a similar environment from where they came in terms of aspect, slope and soil depth.
- Transplants must remain within the site and may not be transported off the site.
- Some species can also grow from cuttings and branches of many succulent species can be rooted in the field.

4.22.5 Use of soil savers

On steep slopes (unlikely along the Grootfontein Access Road) and areas where seed and organic matter retention is low, it is recommended that soil savers are used to stabilise the soil surface. Soil savers are man-made materials, usually constructed of organic material such as hemp or jute and are usually applied in areas where traditional rehabilitation techniques are not likely to succeed.

- In areas where soil saver is used, it should be pegged down to ensure that is captures soil and organic matter flowing over the surface.
- Soil saver may be seeded directly once applied as the holes in the material catch seeds and provide suitable microsites for germination. Alternatively, fresh mulch containing seed can be applied to the soil saver.

4.22.6 General recommendations

Progressive rehabilitation is an important element of the rehabilitation strategy and should be implemented where feasible.

- Once re-vegetated, areas should be protected to prevent trampling and erosion.
- No construction equipment, vehicles or unauthorised personnel should be allowed onto areas that have been vegetated.
- Where rehabilitation sites are located within actively grazed areas, they should be fenced.
- Fencing should be removed once a sound vegetative cover has been achieved.
- Any runnels, erosion channels or wash ways developing after revegetation should be backfilled and consolidated and the areas restored to a proper stable condition.

4.23 Alien Plant Management Plan

OUTCOME: To manage alien species in compliance with the AIS regulations.

The Alien Vegetation management plan must be developed and implemented.

The following actions are summarised from this plan

4.23.1 Alien Species Presence & Abundance on the Property.

The Grootfontein access road has minimal invasive vegetation. The density of alien species within the intact vegetation is generally very low and is restricted to disturbed areas around watering points. Species which are likely to require specific attention include *Prosopis glandulosa*, *Argemone ochroleuca*, *Datura ferox* and *Xanthium spinosum*. *Prosopis gladulosa* is not likely to become an immediate problem, but may gradually invade areas within or near the facility which receive additional runoff. The other species are likely to respond more quickly and may become a problem even during construction if there is sufficient rainfall.

4.23.2 Use of Herbicides for Alien Control

Although it is usually preferable to use manual clearing methods where possible, such methods may create additional disturbance which stimulates alien invasion and may also be ineffective for many woody species which resprout. Where herbicides are to be used, the impact of the operation on the natural environment should be minimised by observing the following:

- Area contamination must be minimised by careful, accurate application with a minimum amount of herbicide to achieve good control.
- All care must be taken to prevent contamination of any water bodies. This includes due care in storage, application, cleaning equipment and disposal of containers, product and spray mixtures.
- Equipment should be washed where there is no danger of contaminating water sources and washings carefully disposed of in a suitable site.
- To avoid damage to indigenous or other desirable vegetation, products should be selected that will have the least effect on non-target vegetation.
- Coarse droplet nozzles should be fitted to avoid drift onto neighbouring vegetation.
- The appropriate health and safety procedures should also be followed regarding the storage, handling and disposal of herbicides.

For all herbicide applications, the following guidelines should be followed:

Working for Water: Policy on the Use of Herbicides for the Control of Alien Vegetation.

The following management actions are aimed at reducing soil disturbance during the construction phase of the development, as well as reducing the likelihood that alien species will be brought onto site or otherwise encouraged.

Table 4: Alien vegetation management requirements during the construction phase.

Action	Frequency
The ECO is to provide permission prior to any vegetation being cleared for development.	Daily
Clearing of vegetation should be undertaken as the work front progresses – mass clearing should not occur unless the cleared areas are to be surfaced or prepared immediately afterwards.	Weekly
Where cleared areas will be exposed for some time, these areas should be protected with packed brush, or appropriately battered with fascine work. Alternatively, jute (Soil Saver) may be pegged over the soil to stabilise it.	Weekly
Cleared areas that have become invaded can be sprayed with appropriate herbicides provided that these are such that break down on contact with the soil. Residual herbicides should not be used.	Weekly
Although organic matter is frequently used to encourage regrowth of vegetation on cleared areas, no foreign material for this purpose should be brought onto site. Brush from cleared areas should be used as much as possible. The use of manure or other soil amendments is likely to encourage invasion.	Weekly

Action	Frequency
Clearing of vegetation is not allowed within 32m of any wetland, 80m of any wooded area, within 1:100 year flood lines, in conservation servitude areas or on slopes steeper than 1:3, unless permission is granted by the ECO for specifically allowed construction activities in these areas.	Weekly
Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas. (Particular attention must be paid to imported material such as building sand or dirty earth-moving equipment.) Stockpiles should be checked regularly and any weeds emerging from material stockpiles should be removed.	Weekly
Alien vegetation regrowth on areas disturbed by construction must be controlled throughout the entire site during the construction period.	Monthly
The alien plant removal and control method guidelines should adhere to best practice for the species involved. Such information can be obtained from the DWAF Working for Water website.	Monthly
Clearing activities must be contained within the affected zones and may not spill over into demarcated No Go areas.	Daily
Pesticides may not be used. Herbicides may be used to control listed alien weeds and invaders only.	Monthly
Wetlands and other sensitive areas should remain demarcated with appropriate fencing or hazard tape. These areas are no-go areas (this must be explained to all workers) that must be excluded from all development activities.	Daily

4.23.3 Concluding Statement

- As there are already several alien species present at the site, alien invasion following disturbance at the site is likely to occur rapidly. As a result, alien control should begin during the construction phase to ensure that the density and abundance of alien species remains manageable into the operational phase.
- In the short-term, soil disturbance is likely to be the dominant driver of alien invasion at the site. While, in the long-term the distribution of runoff is likely to be a key driver as those areas which receive water will be wetter and likely to contain a higher alien abundance.
- As disturbance is the major initial driver of alien species invasion, keeping the disturbance footprint to a minimum is a key element in reducing alien abundance. Wherever possible, the indigenous vegetation should be left intact as this will significantly reduce the likelihood of alien invasion.

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5 OPERATIONAL PHASE ENVIONMENTAL MANAGEMENT

The Operational Phase environmental management requirements are limited and are the same as the following Construction phase requirements:

- Dust control

- Invasive Alien Vegetation Management.

6 CLOSURE & DECOMMISSIONING PHASE ENVIRONMENAL MANAGEMENT

After the lifespan of the facility (20-25 years), there is a possibility that the entire facility including this access road may be decommissioned and closed (although other options for continuation may be investigated). In the interest of future land use, it must be noted that the best practicable environmental option may be to leave the access road in situ.

Appendix 5 of Regulation 982 of the 2014 EIA Regulations contains the required contents of a Closure Plan. The table below shows the minimum requirements for a closure plan. The operating entity for this facility must ensure that the closure plan complies with these requirements as well as any other legislative requirements that may come into effect during the lifecycle of the project.

Table 5: Legislative requirements for a closure plan.

Requirement
(1) A closure plan must include -
(a) Details of - (i) The EAP who prepared the closure plan; and (ii) The expertise of that EAP.
(b) Closure objectives.
(c) Proposed mechanisms for monitoring compliance with and performance assessment against the closure plan and reporting thereon.
(d) Measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity and associated closure to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development including a handover report, where applicable.
(e) Information on any proposed avoidance, management and mitigation measures that will be taken to address the environmental impacts resulting from the undertaking of the closure activity.
(f) A description of the way it intends to – (i) Modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation during closure; (ii) Remedy the cause of pollution or degradation and migration of pollutants during closure. (iii) Comply with any prescribed environmental management standards or practises; or (iv) Comply with any applicable provisions of the Act regarding closure.
(g) Time periods within which the measure contemplated in the closure plan must be implemented.
(h) The process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of closure.
(i) Details of all public participation processes conducted in terms of regulation 41 of the Regulation, including – (i) Copies of any representations and comments received from registered interested and affected parties; (ii) A summary of comments received from, and a summary of issues raised by registered interested and affected parties, the date of receipt of these comments and the response of the EAP to those comments; (iii) The minutes of any meetings held by the EAP with interested and affected parties and other role players which record the views of the participants;

Requirement	
	(iv) Where applicable, an indication of the amendments made to the plan as a result of public participation processes conduction in terms of regulation 41 of these Regulations.
(j)	Where applicable, details of any financial provisions for the rehabilitation, closure and ongoing post decommissioning management of negative environmental impacts.

Within a period of at least 12 months prior to the planned closure and decommissioning of the site a Closure Plan must be prepared and submitted to the Local Planning Authority, as well as the Provincial and National Environmental Authorities for input and approval. This plan must provide detail pertaining to site restoration, soil replacement, landscaping, pro-active conservation, and a timeframe for implementation. Furthermore, Plan must comply with any additional legislation and guidelines that may be applicable at the time.

7 MONITORING AND AUDITING

Environmental monitoring and audits are fundamental in ensuring the implementation of the management actions contained within this EMPr, environmentally sustainable development and maintenance of the Grootfontein Access Road.

To promote transparency and cooperative governance, the results of relevant audits should be submitted to:

- The operators of the facility;
- The local authority.
- The provincial environmental authority: Department of Environmental Affairs & Nature Conservation (DENC).
- The national environmental authority: Department of Environmental Affairs (DEA); and
- Eskom.

The results of the audit must be recorded in an environmental audit report and any non-compliance must be formally recorded, along with the response-action required or undertaken. Each non-compliance incident report must be issued to the relevant person(s), so that the appropriate corrective and preventative action is taken within an agreed upon timeframe.

Appendix 7 of Regulation 982 of the 2014 EIA Regulations contains the required contents of an Environmental Audit Report. The table below shows the legislated requirements of an audit reports, and all relevant environmental audits undertaken as part of this development (during construction and operation) should comply with these requirements.

Table 6: Contents of an audit report

(1) An Environmental audit report prepared in terms of these Regulations must contain:
(a) Details of – (i) The independent person who prepared the environmental audit report; and (ii) The expertise of independent person that compiled the environmental audit report.
(b)Details of – (i) The independent person who prepared the environmental audit report; and (ii) The expertise of independent person that compiled the environmental audit report.
(c) A declaration that the independent auditor is independent in a form as may be specified by the competent authority.

(d) An indication of the scope of, and the purpose for which, the environmental audit report was prepared.
(e) A description of the methodology adopted in preparing the environmental audit report.
(f) An indication of the ability of the EMPr, and where applicable the closure plan to – (i) Sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity on an on-going basis; (ii) Sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the closure of the facility; and (iii) Ensure compliance with the provisions of environmental authorisation, EMPr, and where applicable, the closure plan.
(g) A description of any assumptions made, and any uncertainties or gaps in knowledge.
(h) A description of a consultation process that was undertaken during the course of carrying out the environmental audit report.
(i) A summary and copies of any comments that were received during any consultation process
(j) Any other information requested by the competent authority.

7.5 ECO Construction Monitoring

The ECO is responsible for environmental monitoring during construction as per the requirements of this EMPr. The monthly environmental monitoring reports compiled by the ECO, as well as the photographic record of works, must be submitted to the operators of the facility, the local authority, the provincial environmental authority, the national environmental authority and Eskom.

7.6 Recording and Reporting to the DEA.

The following recording and reporting requirements are required:

- The holder of the authorisation must keep all records relating to monitoring and auditing on site and make it available for inspection to any relevant and competent authority in respect of this development.

All documentation e.g. Audit/monitoring/compliance reports and notifications required to be submitted to the department in terms of the EA, must be submitted to the Director: Compliance monitoring.

7.7 Environmental Audit Report

The holder of the EA must submit an environmental audit report to the department within 30 days of completion of the construction phase (i.e. within 30 Days of site handover) and within 30 days of completion of rehabilitation activities.

This environmental audit report must:

- Be compiled an independent environmental auditor;
- Indicate the date of the audit, the name of the auditor and the outcome of the audit;
- Evaluate compliance with the requirements of the approved EMPr and the Environmental Authorisation;
- Include measures to be implemented to attend to any non-compliances or degradation noted;
- Include copies of approvals granted by other authorities relevant to the development for the reporting period;

- Highlight any outstanding environmental issues that must be addressed, along with recommendations for ensuring these issues are appropriately addressed;
- Include a copy of the EA and the approved EMPr;
- Include all documentation such as waste disposal certificates, hazardous waste landfill site licences etc, pertaining to this authorisation; and
- Include evidence of adherence to the conditions of this authorisation and the EMPr where relevant such as training records and attendance registers.

7.8 Plant Rescue monitoring requirements

The following reporting and monitoring requirements are recommended as part of the plant rescue and protection:

- Preconstruction walk-through report detailing the location and distribution of all listed and protected species.
- Monitoring during construction by the ECO to ensure that listed species and sensitive habitats are avoided. All incidents should be recorded along with the remedial measures implemented.
- Post construction monitoring of plants translocated during search and rescue to evaluate the success of the intervention. Monitoring for a year post-transplant should be enough to gauge success.

7.9 Habitat Restoration Monitoring requirements

As rehabilitation success, particularly in arid areas is unpredictable, monitoring and follow-up actions are important to achieve the desired cover and soil protection.

- Re-vegetated areas should be monitored every 4 months for the first 12 months following construction.
- Re-vegetated areas showing inadequate surface coverage (less than 20% within 12 months after re-vegetation) should be prepared and re-vegetated;
- Any areas showing erosion, should be re-contoured and seeded with indigenous grasses or other locally occurring species which grow quickly.

7.10 Alien Vegetation Monitoring During the Construction Phase

The following monitoring actions should be implemented during the construction phase of the development.

Table 7: Alien vegetation monitoring requirements during the construction phase.

Monitoring Action	Indictor	Timeframe
Document alien species present at the site	List of alien species	Preconstruction
Document alien plant distribution	Alien plant distribution map within priority areas	3 Monthly
Document & record alien control measures implemented	Record of clearing activities	3 Monthly

Review & evaluation of control success rate	Decline in documented alien abundance over time	Biannually

7.11 Alien Vegetation Monitoring During the Operational Phase

The following monitoring and evaluation actions should take place during the operational phase of the development.

Table 8: Alien vegetation monitoring requirements during the operational phase

Monitoring Action	Indictor	Timeframe
Document alien species distribution and abundance over time at the site	Alien plant distribution map	Biannually
Document alien plant control measures implemented & success rate achieved	Records of control measures and their success rate. A decline in alien distribution and cover over time at the site	Biannually
Document rehabilitation measures implemented, and success achieved in problem areas	Decline in vulnerable bare areas over time	Biannually

8 METHOD STATEMENTS

Method statements are written submissions by the Contractor to the Engineer and ECO in response to the requirements of this EMPr or in response to a request by the Engineer or ECO. The Contractor shall be required to prepare method statements for several specific construction activities and/or environmental management aspects.

The Contractor shall not commence the activity for which a method statement is required until the Engineer and ECO have approved the relevant method statement.

Method statements must be submitted at least five (5) working days prior to the proposed date of commencement of the activity. Failure to submit a method statement may result in suspension of the activity concerned until such time as a method statement has been submitted and approved.

An approved method statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the contract. However, **any damage caused to the environment through activities undertaken without an approved method statement shall be rehabilitated at the contractor's cost**.

Additional method statements can be requested at the ECO's discretion at any time during the construction phase.

The method statements should include relevant details, such as:

- Construction procedures and location on the construction site;
- Start date and duration of the specific construction procedure;
- Materials, equipment and labour to be used;
- How materials, equipment and labour would be moved to and from the development site, as well as on site during construction;

- Storage, removal and subsequent handling of all materials, excess materials and waste materials;
- Emergency procedures in case of any potential accident / incident which could occur during the procedure;
- Compliance / non-compliance with an EMPr specification and motivation for proposed non-compliance.

8.5 Method Statements Required

Based on the specifications in this EMPr, the following method statements are likely to be required as a minimum (more method statements may be requested at any time as required under the direction of the ECO):

- Vegetation clearing & topsoil stripping, and associated stockpiling;
- Hazardous substances declaration of use, handling and storage – e.g. for fuels, chemicals, oils and any other harmful / toxic / hazardous materials;
- Cement and concrete batching;
- Traffic, transport & delivery accommodation e.g. need for traffic diversion/turning circles etc.;
- Solid waste management / control procedures;
- Stormwater and wastewater management / control systems;
- Erosion remediation and stabilisation;
- Fire control and emergency procedures;
- Job site security plan;
- Blasting activities (if necessary);
- Re-vegetation, rehabilitation and re-seeding.

9 HEALTH AND SAFETY

The Occupational Health and Safety Act (No. 85 of 1993) aims to provide for / ensure the health and safety of persons at work or in connection with the activities of persons at work and to establish an advisory council for occupational health and safety.

The main Contractor must ensure compliance with the Occupational Health and Safety Act, as well as that all subcontractors comply with the Occupational Health and Safety Act.

The following is of key importance (Section 8 of the aforesaid Act):

General duties of employers to their employees

(1) *Every employer shall provide and maintain, as far as is reasonably practicable, a working environment that is safe and without risk to the health of his employees.*

(2) *Without derogating from the generality of an employer's duties under subsection (1), the matters to which those duties refer include in particular-*

(a) *the provision and maintenance of systems of work, plant and machinery that, as far as is reasonably practicable, are safe and without risks to health;*

(b) *taking such steps as may be reasonably practicable to eliminate or mitigate any hazard or potential hazard to the safety or health of employees, before resorting to personal protective equipment;*

(c) *making arrangements for ensuring, as far as is reasonably practicable, the safety and absence of risks to health in connection with the production, processing, use, handling, storage or transport of articles or substances;*

(d) *establishing, as far as is reasonably practicable, what hazards to the health or safety of persons are attached to any work which is performed, any article or substance which is produced, processed, used, handled, stored or transported and any plant or machinery which is used in his business, and he shall, as far as is reasonably practicable, further establish what precautionary measures should be taken with respect to such work, article, substance, plant or machinery in order to protect the health and safety of persons, and he shall provide the necessary means to apply such precautionary measures;*

(e) *providing such information, instructions, training and supervision as may be necessary to ensure, as far as is reasonably practicable, the health and safety at work of his employees;*

(f) *as far as is reasonably practicable, not permitting any employee to do any work or to produce, process, use, handle, store or transport any article or substance or to operate any plant or machinery, unless the precautionary measures contemplated in paragraphs (b) and (d), or any other precautionary measures which may be prescribed, have been taken;*

(g) *taking all necessary measures to ensure that tire requirements of this Act are complied with by every person in his employment or on premises under his control where plant or machinery is used;*

(h) *enforcing such measures as may be necessary in the interest of health and safety;*

(i) *ensuring that work is performed and that plant or machinery is used under the general supervision of a person trained to understand the hazards associated with it and who have the authority to ensure that precautionary measures taken by the employer are implemented; and*

(j) *causing all employees to be informed regarding the scope of their authority as contemplated in section 37 (1) (b).*

10 CONTRACTORS CODE OF CONDUCT

The Contractor's Code of Conduct is a document to be drawn up by the solar facility Developer and provided to all contractors or subcontractors that undertake any service on site. This code of conduct should include generic conduct rules for construction and operation activities on Grootfontein Access Road and must be signed by all contractors. **This code of conduct does not exonerate contractors from complying with this EMPr and must not be viewed as a stand-alone document**.

The following general template is suggested for this Code of Conduct document and must be adapted and updated to include the provisions of this EMPr, recommendations of participating specialists, conditions of approval of the Environmental Authorisation, conditions imposed by the Local Authority (as part of the rezoning and consent use), as well as the all service agreements.

10.5 Objectives

To ensure compliance with the Conditions of the Environmental Authorisation, the Environmental Management Programme (EMPr), recommendations of participating

specialists, conditions imposed by the Local Authority as part of the rezoning and subdivision, as well as the service agreements.

- To ensure the least possible damage to:
  - Existing infrastructure on and adjacent to the site;
  - Indigenous flora and fauna (biophysical environment); and
  - Water quality of surface and groundwater on and surrounding the site. Particularly the water quality entering and exiting the on-site washes/minor drainage lines;
- Construction and development are undertaken with due consideration to all environmental factors;
- Where such damage occurs, provision is made for re-instatement and rehabilitation;

10.6 Acceptance of Requirements

In order to achieve these objectives, the Developer and Contractor bind themselves jointly and severally to fulfil and comply with all the obligations contained herein, as well as prescriptions and obligations contained in other documents controlling the development of the Grootfontein Access Road.

10.7 Contractor's Pre-Construction Obligations

Contractors may not commence any construction activities on the Grootfontein access road until:

- The Contractor and the ECO have carried out a joint site inspection (this is to be done as part of the pre-construction compliance workshop as detailed in the EMPr);
- A qualified ecologist has undertaken an inspection of the final development footprint and determined the number, species and extent of protected / listed plant species within this area (this has already been done);
- A permit for the removal or relocation-and-transplant of these protected / listed plant species has been obtained from Cape Nature;
- Search and rescue of sensitive plants, within the development footprint has been carried out in compliance with the plant rescue and protection plan in appendix D and signed off by the ECO (where this is necessary);
- The construction and no-go areas are suitably demarcated to the satisfaction of the ECO;
- Where necessary, approval of Building / Construction Plans has been obtained from the local authority and
- All contract staff has attended the required environmental induction training and on-going environmental education sessions, as necessary.

10.8 Contractor's Obligations During Construction

- The Contractor is required to comply with the necessary Health and Safety requirements as required by the Occupational Health and Safety Act of 1993;
- The Contractor must comply with the construction requirements as detailed in the EMPr, including the following plans detailed therein:
  - Transport & Traffic Management Plan,
  - Stormwater and Erosion-Control Management Plan,
  - Vegetation Clearing & Plant Rescue Plan,
  - Re-vegetation & Rehabilitation Plan,
  - Alien Management Plan

  - Open Space Management Plan;
- The contractor must comply with all the requirements detailed in the Environmental Authorisation;
- All conditions, processes and fees as prescribed by the Local Authority must be complied with; and
- The Contractor shall only be permitted to erect a single signboard which must comply with legislative requirements.

11 IMPLEMENTATION

The following table is provided to assist the developer, design team, engineer and contractor with the effective implementation of this EMPr. The table below serves as a quick reference guide to the EMPr but must be read in conjunction with the entire document.

Item		Management Action	Timing	Responsible Party	Monitoring
Design & Pre-Construction Phase					
Familiarisation with the contents of the EMPr & EA.		Attendance of a pre-construction environmental compliance workshop	Prior to commencement of site clearing & earthworks.	ECO, Engineers, Contractor & Project Management.	ECO to include details of this in the first environmental control Report.
		Environmental induction of all staff.	Prior to commencement of earthworks.	ECO and all contract staff.	Contractor to keep records of all staff attending inductions.
Demarcation of Development Areas and No-Go Areas.		All areas outside of the construction / development area to be clearly demarcated. All sensitive drainage lines & vegetation outside development area are considered no-go.	Prior to commencement of site clearing & earthworks.	Contractor with input from the Engineer, ECO and participating specialists where necessary. Contractor responsible for maintaining demarcation throughout the construction phase.	ECO to maintain photographic record of demarcation.
Obtain Permit for removal / translocation of protected plant species.		Permit application to be informed be list of protected plant species found by the ecological specialist within the final facility development footprint. Permit requirements & list to inform updated plant rescue plan.	Prior to plant rescue and vegetation clearing.	ECO, ESA, Ecological Specialist & Contractor	ECO & Ecological specialist to provide photographic record of protected plant species (to be used in on-going Environmental Education) and of plant rescue & translocation operation.
Environmental Induction Training		As defined in the EMPr	Prior to commencement of site clearing & earthworks.	ECO & Contractor	Contractor to provide details to ECO. ECO to provide details in monthly reports.
	Construction Phase				

Item		Management Action	Timing	Responsible Party	Monitoring
Minimise impact of construction vehicles		Implementation of recommendations of Transport & Traffic Plan defined in EMPr.	Throughout construction phase	Contractor	Engineer
Prevent concrete contamination		Use of delivered ready-mix concrete. Control at batching sites	Throughout construction phase	Contractor	Engineer, ESA and ECO.
Prevention of erosion of cable trenches		Implementation of recommendations of Erosion Management Plan defined in EMPr.	During detailed design and throughout the construction phase.	Contractor	Engineer, ESA and ECO.
Protection of Archaeological Resources		Avoidance of drainage line and pans within and outside development area and quartz patches as far as possible. Report archaeological occurrences found during earthworks to NCHRA & SAHRA.	Demarcation of sites prior to commencement of earthworks. Other mitigations throughout the construction phase.	Contractor	ESA, ECO & archaeologist.
Protection of hydrological resources (surface & underground).		As per the requirements of the EMPr.	Throughout the construction phase.	Contractor	ECO
Protection of all topsoil resources on site.		As per the requirements of the EMPr i.e. brush/straw packing & re-seeding	Throughout the construction phase.	Contractor	ECO
Limiting Noise Impact		As per the requirement of the EMPr.	Design, throughout the construction and operation phase	Contractor, ER	ECO & ER
Reduction of dust generation as a result of construction activities.		As per the requirements of the EMPr. Do not strip topsoil from entire development footprint	Throughout the construction phase	Contractor	ECO & ER.
Providing for effective ecological corridors		Implementing the fencing requirements as defined by the ecological specialist and this EMPr.	Design and construction phases.	ER & Contractor	ECO & ER.

Item		Management Action	Timing	Responsible Party	Monitoring
Preventing of Erosion and siltation of the wash / drainage lines.		Implementation of Stormwater Management and Erosion Control Measures detailed in this EMPr, as well as those made by the ecological specialists.	Design phase and throughout the construction phase	Design Team, Engineer and Contractors	ECO & ER.
Protection of protected plant species and on-going re-vegetation & rehabilitation.		Implementation of Plant Rescue, Re-vegetation & Rehabilitation Plan, as well as recommendation of ecological specialist.	Design phase and throughout the construction phase.	Design Team, Engineer and Contractors	ECO & ER.
Prevention of theft and other crime.		Development of a job site security plan.	Before commencement of construction.	Contractor	ER
On-going Environmental Education		As defined in the EMPr.	During construction.	ECO & Contractor	Contractor to provide details to ECO. ECO to provide details in monthly reports.
Prevent pollution resulting from oil and fuel storage and handling.		Implement correct fuel and oil handling procedures. Implement emergency spill response plan.	Duration of the project lifespan.	ECO & Contractor	ECO, ER & Contractor
	Operational Phase				
Prevent pollution resulting from oil and fuel storage and handling.		Implement correct fuel and oil handling procedures. Implement emergency spill response plan.	Duration of the project lifespan	Facility operator	Facility manager and Environmental Authority.
Manage vegetation growth		Trimming of vegetation under panels to avoid overshadowing and fire risk.	Throughout operation	Operation & Maintenance staff.	Operation staff to report to Operator.
Prevent & manage erosion / obstruction of washes / drainage lines		Regular monitoring of wash to remove obstructions and repair erosion.	Throughout operation	Operation & Maintenance staff.	Operation staff to report to Operator.
Control of alien plants		Regular monitoring and removal of alien invasive plant species.	Throughout operation	Operation & Maintenance staff.	Operation staff to report to Operator.
On-going Environmental Education		As defined in the EMPr	During maintenance and operation.	Operation & Maintenance staff.	Operation staff to report to Operator.

Item		Management Action	Timing	Responsible Party	Monitoring
	Closure & Decommissioning Phase				
	Items, management, responsibilities and monitoring as per construction phase, as above.				
On-going Environmental Education		As defined in the EMPr	During decommissioning.	ECO & Contractor	Contractor report to ECO. ECO to provide details in monthly reports.

12 NON-COMPLIANCE

Should any person commit an action of non-compliance he/she may be convicted of an offence, in terms of Sub-regulation (1) of the National Environmental Management Act, to imprisonment for a period not exceeding two years or to a fine not exceeding an amount prescribed in terms of the Adjustment of Fines Act, 1991 (Act No. 101 of 1991).

Apart from a fine resulting from any legal mechanism, the ECO may advise the ER to impose a penalty for non-compliance in terms of this Environmental Management Programme (EMPr). The procedure detailed below is for a spot fine in terms of this EMPr and does not detail the procedure for fining in terms of any other legal mechanism.

12.5 Procedures

The contractor shall comply with the environmental specifications and requirements of this EMPr, the Environmental Authorisation (EA) and Section 28 of NEMA, on an on-going basis and any failure on his part to do so will entitle the ER to impose a penalty.

In the event of non-compliance, the following recommended process shall be followed:

- The ECO shall issue a notice of non-compliance to the ER, stating the nature and magnitude of the contravention. A copy shall be provided to the Project Developer / Proponent.
- The ER will issue this notice to the Contractor.
- The Contractor shall act to correct the transgression within the period specified by the ER.
- The Contractor shall provide the ER with a written statement describing the actions to be taken to discontinue the non-compliance, the actions taken to mitigate its effects and the expected results of the actions. A copy shall be provided to the Project Developer / Proponent.
- In the case of the Contractor failing to remedy the situation within the predetermined time frame, the ER shall impose a monetary penalty (spot fine) based on the conditions of contract.
- Should the transgression be a blatant disregard of conditions of the EMPr or EA, the ER (on advice from the ECO) can at their discretion immediately issue a fine and require the remediation (without first giving the contractor a chance to remediate)
- In the case of non-compliance giving rise to physical environmental damage or destruction, the ER shall be entitled to undertake or to cause to be undertaken such remedial works as may be required to make good such damage and to recover from the Contractor the full costs incurred in doing so.
- In the event of a dispute, difference of opinion, etc. between any parties in regard to or arising out of interpretation of the conditions of the EMPr, disagreement regarding the implementation or method of implementation of conditions of the EMPr or EA etc. any party shall be entitled to require that the issue be referred to specialists for determination.
- The ER on advice from the ECO shall always have the right to stop work and/or certain activities on site in the case of non-compliance or failure to implement remediation measures.

12.6 Offences and Penalties

Any avoidable non-compliance with the conditions of the EMPR shall be considered sufficient ground for the imposition of a penalty by the Engineer

Possible offences, which should result in the issuing of a contractual penalty, include, but are not limited to:

- Unauthorised entrance into no-go areas;
- Catching and killing of wild animals, and removal or damage to conservation-worthy plant species;
- Open fires outside of the contractor camp site and insufficient fire control;
- Unauthorised damage to natural vegetation;
- Unauthorised camp establishment (including stockpiling, storage, etc.);
- Hydrocarbons / hazardous material: negligent spills / leaks and insufficient storage;
- Ablution facilities: non-use, insufficient facilities, insufficient maintenance;
- Insufficient solid waste management (including clean-up of litter, unauthorised dumping etc.;
- Erosion due to negligence / non-performance;
- Excessive cement / concrete spillage / contamination;
- Non-induction of staff.

13 REFERENCES

DEA (2010). *National Climate Change Response Green Paper 2010.*

DEA (January 2008). *National Response to South Africa's Electricity Shortage.* Interventions to address electricity shortages.

DEA&DP (2003). Waste Minimisation *Guideline for Environmental Impact Assessment reviews.* NEMA EIA Regulations Guideline & Information Series, Department Environmental Affairs & Development Planning.

DEA&DP (2005). *Guideline for the review of specialist input in the EIA process*. NEMA EIA Regulations Guideline & Information Document Series, Department of Environmental Affairs & Development Planning.

DEA&DP (2005). *Guideline for involving biodiversity specialists in the EIA process*. NEMA EIA Regulations Guideline & Information Document Series, Department of Environmental Affairs & Development Planning.

DEA&DP (2005). *Guideline for environmental management plans*. NEMA EIA Regulations Guideline & Information Document Series, Department of Environmental Affairs & Development Planning.

DEA&DP (2005). *Provincial urban edge guideline*. Department Environmental Affairs & Development Planning.

DEA&DP (2006). *Guideline on the Interpretation of the Listed Activities.* NEMA EIA Regulations Guidelines & Information Document Series, Department of Environmental Affairs & Development Planning.

DEA&DP (2007). *Guide on Alternatives,* NEMA EIA Regulations Guidelines & Information Document Series, Department of Environmental Affairs & Development Planning.

DEA&DP (2007). *Guideline on Appeals,* NEMA EIA Regulations Guidelines & Information Document Series, Department of Environmental Affairs & Development Planning.

DEA&DP (2007). *Guideline on Exemption Applications.* NEMA EIA Regulations Guidelines & Information Document Series, Department of Environmental Affairs & Development Planning.

DEA&DP (2007). *Guideline on Public Participation*. NEMA EIA Regulations Guidelines & Information Document Series, Department of Environmental Affairs & Development Planning.

DEA&DP (2009). *Guideline on Need & Desirability,* NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.

DEA&DP (2009). *Guideline on Alternatives*, NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.

DEA&DP (2009). *Guideline on Transitional Arrangements,* NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.

DEA&DP (2009). *Guideline on Exemption Applications*. NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.

DEA&DP (2009). *Guideline on Appeals*. NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.

DEA&DP (2009). *Guideline on Public Participation*. NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.

DEA&DP. (May 2006). *Strategic Initiative to Introduce Commercial Land Based Wind Energy Development to the Western Cape*: Specialist Study: Executive Summary - CNdV Africa prepared for Provincial Government of the Western Cape.

Department of Mineral & Energy (1998). *White Paper on Energy Policy of the Republic of South Africa***.**

Department of Mineral & Energy (2003). *The White Paper on Renewable Energy***.**

DEAT (2002). Integrated Environmental Management Information Series 3: *Stakeholder Engagement*. Department of Environmental Affairs and Tourism, Pretoria.

DEAT (2004). *Criteria for determining alternatives in EIAs*, Integrated Environmental Management, Information Series 11, Department of Environmental Affairs & Tourism, Pretoria.

DEAT (2004). *Environmental Management Plans*, Integrated Environmental management, Information Series 12, Department Environmental Affairs & Tourism.

DEAT (2005). *Assessment of Impacts and Alternatives*, Integrated Environmental Management Guideline Series, Department of Environmental Affairs & Tourism, Pretoria.

DEAT (2005). Guideline 4: *Public Participation*, in terms of the EIA Regulations 2005, Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism, Pretoria.

DEAT (2006). *EIA Regulations* in terms of the National Environmental Management Act (Act No 107 of 1998) (Government Notice No R 385, R 386 and R 387 in Government Gazette No 28753 of 21 April 2006).

DWA (2001). *Generic public participation guideline*. Department of Water Affairs and Forestry.

Hsai-Yang, F (Ed)(2006). *Environmental Geotechnology Dictionary* (online version). University of North Caroline, Charlotte, USA.

Integrated Resource Plan for Electricity (Oct. 2010)**.** Revision 2, Version8.

International Finance Corporation – World Bank Group. (April 2007). *Environmental, Health and Safety Guidelines for Electric Power Transmission and Distribution.*

International Finance Corporation – World Bank Group. (April 2007). *Environmental, Health and Safety Guidelines for Wind Energy.*

International Finance Corporation – World Bank Group. (April 2007). *General Environmental, Health and Safety Guidelines.*

Keatimilwe K & Ashton PJ 2005. *Guideline for the review of specialist input in EIA processes.* Department Environmental Affairs & Development Planning.

Lochner P (2005). *Guideline for Environmental Management Plans*. Department Environmental Affairs & Development Planning.

Lower Orange River Transfrontier Conservation Area Planning: Background Information Document (August 2007). Retrieved on 29 March 2012 from:

www.dwaf.gov.za/Documents/Other/RMP/LOR/LORRMPBIDAug07.pdf

Lubbe, C. (2019). Agricultural Potential Study for Bloemsmond 5, Lubbe, Swellendam.

Mucina, L. & Rutherford, M.C. (eds) 2006. *The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19.* South African National Biodiversity Institute, Pretoria.

Münster, F. (2005). *Guidelines for Determining the Scope of Specialist Involvement in EIA Processes: Edition 1.* CSIR Report No ENV-S-C 2005 053 A. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs and Development Planning, Cape Town.

Oberholzer B (2005). *Guideline for involving visual & aesthetic specialists*. Department Environmental Affairs & Development Planning.

National Energy Regulator of South Africa (NERSA)(Feb.2010). *Rules on selection criteria for renewable energy projects under the REFIT Programme.*

National Protected Area Expansion Strategy for S.A. 2008: Priorities for expanding the protected area network for ecological sustainability and climate change adaptation. Government of South Africa, Pretoria, 2010. ISBN 978-1-919976-55-6.

Saayman, I. (2005). *Guideline for Involving Hydrogeologists in EIA Processes: Edition 1.* CSIR Report No ENV-S-C 2005 053 D. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs and Development Planning, Cape Town.

SANBI Biodiversity GIS (2007). South African National Biodiversity Institute, Cape Town, South Africa.

Winter S & Beaumann N (2005). *Guideline for involving heritage specialists in EIA processes.* Department Environmental Affairs & Development Planning.

Appendix A: Site Development Plan.

Appendix B: Stormwater, Erosion and Washwater Management Plan

Appendix C: Transport Study and Traffic Management Plan.