



## **Draft Environmental Management Programme (EMPr)**

**Proposed development of a 75 MW Solar Photovoltaic Facility (Gemsbok Solar PV5), near Kenhardt, Northern Cape Province**

# PART 3:

Generic Environmental Management Programme (EMPr) for the Power Line to support the Gemsbok Solar PV5 Facility

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# 1 INTRODUCTION AND PROJECT BACKGROUND

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On 22 December 2020, Mulilo Total Coega (Pty) Ltd submitted a Bid (Reference Number: RM-TA-0180-002) in response to the Risk Mitigation Independent Power Producer Procurement Programme (RMIPPPP) Tender No: DMRE001/2020/21. The proposed project submitted consists of a dispatchable gas to power plant facility in the Coega Industrial Development Zone (IDZ) in the Eastern Cape near Port Elizabeth, and a non-dispatchable, Solar photovoltaic facility comprised of three previously authorized solar developments located north-east of Kenhardt, in the Northern Cape of South Africa. The non-dispatchable solar PV facilities are the subject of this report and consist of the following projects:

- Gemsbok Solar PV2 (Reference Numbers: 14/12/16/3/3/2/711 and 14/12/16/3/3/2/711/AM1);
- Gemsbok Solar PV5 (Reference Numbers: 14/12/16/3/3/2/843); and
- Gemsbok Solar PV6 (Reference Numbers: 14/12/16/3/3/2/844 and 14/12/16/3/3/2/844/AM1) (i.e. this application).

**This report only focuses on the non-dispatchable solar PV facilities noted above, and does not include the gas to power plant in the Coega IDZ.**

Following the evaluation of bids received under the RMIPPPP tender window, the Minister of Mineral Resources and Energy announced the eight Preferred Bidders on 18 March 2021. The proposed Mulilo Total Coega project was selected as a **Preferred Bidder** and as a result of the nature of the proposed project, it has been formally declared a Strategic Integrated Project (SIP) under SIP project No. 20 (Energy) Sub-Project (a). Emergency/Risk Mitigation Power Purchase Procurement Programme (2000MW): National as Gazetted in Government Gazette 43547, Government Notice 812 on 24 July 2020. The Applicant has received a letter of confirmation of SIP status from the relevant sector representative (i.e. SIP Coordinator). The proposed project must reach Financial Close by the end of July 2021 and should aim to connect to the grid by August 2022 (estimated). Therefore, construction of the proposed PV projects must take place as soon as possible.

Each solar PV power generation facility will have a capacity of 75 MW, and will include associated infrastructure i.e. various structures, buildings and electrical grid infrastructure (EGI) such as, but not limited to, power lines and on-site substations. The three proposed Solar PV facilities will connect to the national grid at the existing Eskom Nieuwehoop Main Transmission Substation (MTS). The proposed projects are located within the !Kheis Local Municipality, which falls within the ZF Mgcau District Municipality.

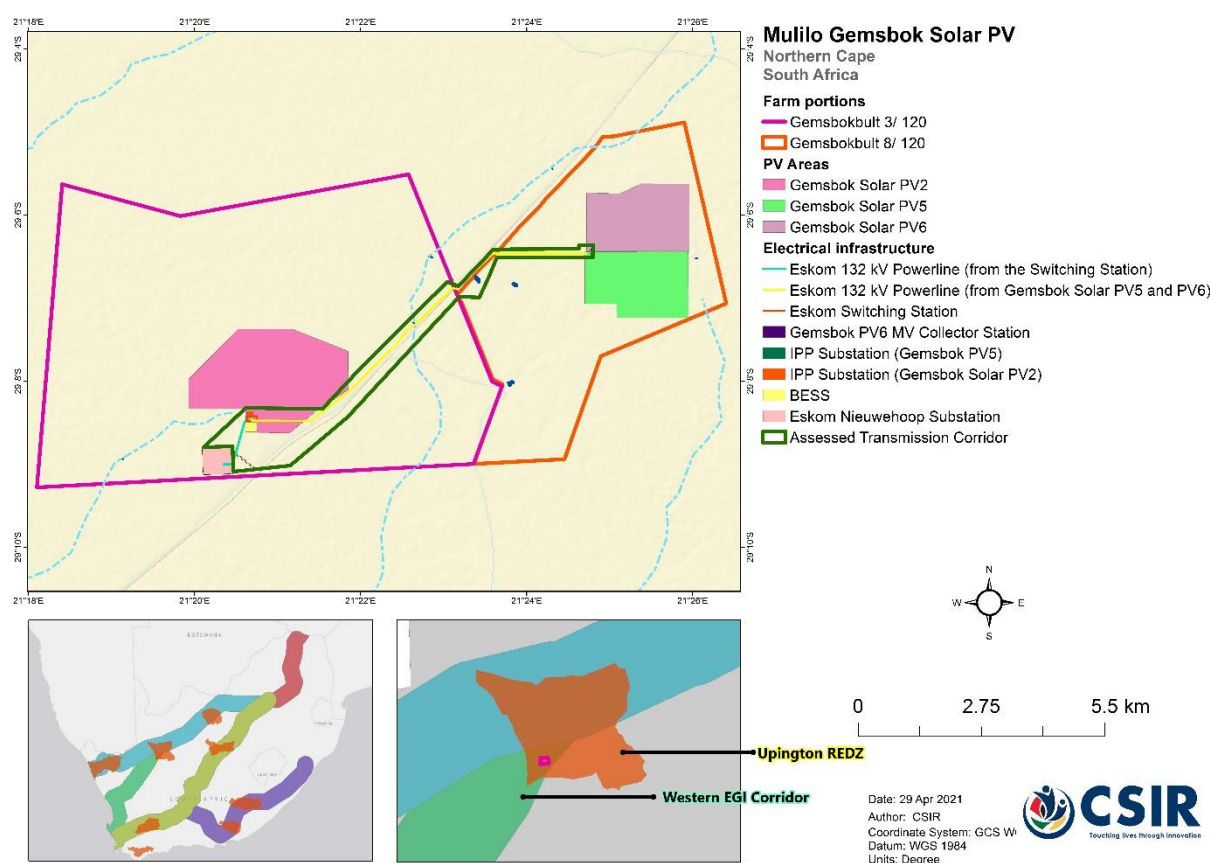
The proposed solar PV projects fall entirely within the Renewable Energy Development Zone (REDZ) 7 (i.e. Upington REDZ), that was Gazetted on 16 February 2018 in Government Gazette 41445, Government Notice (GN) 114. The location of the proposed project within a REDZ (specifically REDZ 7) supports the development of a large-scale renewable energy project.

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The proposed projects also fall within the Western EGI Corridor, one of the five EGI Corridors gazetted in February 2018, in Government Gazette 41445, GN 113. However, while Listed Activity 9 of Listing Notice 2 of the 2014 National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) EIA Regulations (as amended) is not triggered, the fact that the proposed projects fall within the EGI Corridor is still important as it indicates that the proposed projects align with the strategic objectives of the country in terms of infrastructure placement.

Refer to Figure 1 for the overall locality of the Gemsbok Solar PV2, Gemsbok Solar PV5, and Gemsbok Solar PV6 projects, and associated infrastructure.



**Figure 1: Locality of the Gemsbok Solar PV facilities, Electricity Grid Corridor and associated infrastructure**

A full Scoping and Environmental Impact Assessment (EIA) process was undertaken for each of the Gemsbok Solar PV2, Gemsbok Solar PV5, and Gemsbok Solar PV6<sup>1</sup> projects over the period of 2014 to 2016. The appointed Environmental Assessment Practitioner (EAP) was the Council for Scientific and Industrial Research (CSIR). The proposed projects received Environmental Authorisation (EA) from the Department of Environmental Affairs (DEA) (now operating as the Department of Forestry, Fisheries and the Environment (DFFE)) in November 2015, September 2018 and November 2018 in terms of the NEMA EIA Regulations.

<sup>1</sup> The Gemsbok Solar PV2 project was originally commissioned as part of Phase 1 of the proposed development, which included a total of three PV facilities; whilst the Gemsbok Solar PV5 and Gemsbok Solar PV6 projects were commissioned as part of the second phase of the proposed development, which included a total of seven PV facilities.

Below is a summary of the EIA decision-making history for the three solar PV projects:

- **Gemsbok Solar PV2**: The original EA (Reference Number 14/12/16/3/3/2/711) for this project is dated 9 November 2015 and was valid for a period of 5 years. An application for an amendment to the original EA was submitted to the Competent Authority in June 2020 to extend the validity of the authorisation, change the preferred type of Energy Storage System and to change the contact details of the holder of the EA (Reference Number 14/12/16/3/3/2/711/AM1). The Amendment to the EA was granted in July 2020 (dated 23 July 2020, Reference Number 14/12/16/3/3/2/711/AM1). The EA is valid until 9 November 2025.
- **Gemsbok Solar PV5**: The Original EA dated 30 August 2016 was refused. An appeal process was thereafter followed. An Appeal decision dated 28 July 2017 was made, and based on this decision, the Competent Authority decided to grant authorisation. The Gemsbok Solar PV5 project then received EA on 19 November 2018 (Reference Number 14/12/16/3/3/2/843). A subsequent appeal was lodged against Condition 35 of the EA on 19 December 2018. Based on the review of the appeal decision as issued by the Minister on 7 June 2019, the Competent Authority, in terms of Chapter 5 of the 2014 NEMA EIA Regulations, decided to amend the EA dated 19 November 2018 by removing condition 35. This letter from the Competent Authority is dated 19 July 2019 with the following Reference Number: 14/12/16/3/3/2/843. The EA is valid for a period of 5 years i.e. until 19 November 2023.
- **Gemsbok Solar PV6**: The Original EA dated 30 August 2016 was refused. An appeal process was thereafter followed. An Appeal decision dated 7 June 2018 was made, and based on this decision, the Competent Authority decided to grant authorisation. The Gemsbok Solar PV6 project then received EA on 10 September 2018 (Reference Number 14/12/16/3/3/2/844). A subsequent Appeal Decision was made on 17 January 2019. Based on the appeal decision dated 17 January 2019, the Competent Authority decided to amend the EA dated 10 September 2018 by removing Condition 34. This letter from the Competent Authority is dated 11 February 2019 with the following Reference Number: 14/12/16/3/3/2/844/AM1. The EA is valid for a period of 5 years i.e. until 10 September 2023.

The Applicants for the Gemsbok Solar PV2, Gemsbok Solar PV5, and Gemsbok Solar PV6 projects at the time of undertaking the EIA Process, and as captured in the project EAs listed above, was **Gemsbok Solar PV2 (Pty) Ltd**, **Gemsbok Solar PV5 (Pty) Ltd**, and **Gemsbok Solar PV6 (Pty) Ltd**, respectively. However, since the project has been bid as part of the RMIPPPP under the name of **Mulilo Total Coega (Pty) Ltd**, the name of the holder of the EA needs to be changed accordingly. Thus, a non-substantive Application for Amendment to the EAs was submitted to the DFFE on 15 April 2021 to apply to change the Project Applicant and transfer the rights and obligations to **Mulilo Total Coega (Pty) Ltd**. The DFFE will make a decision on the application within a period of 30-days.

The Project Names, Reference Numbers, Project Applicants, and respective farm portions affected by the proposed PV facilities, EGI and associated infrastructure are shown in Table 1 below.

**Table 1: Project Names, Reference Numbers, Applicants and Affected Farm Portions.**

Project Name	Reference Number	Original and Amended Project Applicant	Affected Farm Portions (PV facility, EGI and Associated Infrastructure)
Gemsbok Solar PV2	<ul style="list-style-type: none"> <li>▪ 14/12/16/3/3/2/711</li> <li>▪ 14/12/16/3/3/2/711/AM1</li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>Original:</u> Gemsbok Solar PV2 (Pty) Ltd</li> <li>▪ <u>Amended:</u> Mulilo Total Coega (Pty) Ltd</li> </ul>	<ul style="list-style-type: none"> <li>▪ Remaining Extent of Portion 3 (Rooidam) of the Farm Gemsbok Bult No. 120</li> </ul>
<b>Gemsbok Solar PV5</b>	<ul style="list-style-type: none"> <li>▪ <b>14/12/16/3/3/2/843</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>Original:</u> <b>Gemsbok Solar PV5 (Pty) Ltd</b></li> <li>▪ <u>Amended:</u> Mulilo Total Coega (Pty) Ltd</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Remaining Extent of Portion 8 (Rooidam) (a Portion of Portion 3) of the Farm Gemsbok Bult No. 120</b></li> <li>▪ <b>Remaining Extent of Portion 3 (Rooidam) of the Farm Gemsbok Bult No. 120</b></li> </ul>
Gemsbok Solar PV6	<ul style="list-style-type: none"> <li>▪ 14/12/16/3/3/2/844</li> <li>▪ 14/12/16/3/3/2/844/AM1</li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>Original:</u> Gemsbok Solar PV6 (Pty) Ltd</li> <li>▪ <u>Amended:</u> Mulilo Total Coega (Pty) Ltd</li> </ul>	<ul style="list-style-type: none"> <li>▪ Remaining Extent of Portion 8 (Rooidam) (a Portion of Portion 3) of the Farm Gemsbok Bult No. 120</li> <li>▪ Remaining Extent of Portion 3 (Rooidam) of the Farm Gemsbok Bult No. 120</li> </ul>

**This report specifically focuses on the Gemsbok Solar PV5 Facility (indicated in bold font in Table 1). Separate reports have been compiled for the Gemsbok Solar PV2 and Gemsbok Solar PV6 Facilities.**

## 1.1 NEED FOR AN EMPr

Condition 15 of the EA for Gemsbok Solar PV5 (14/12/16/3/3/2/843) states the following:

- *“The Environmental Management Programme (EMPr) submitted as part of the EIAr is not approved and must be amended to include measures as dictated by the final site lay-out map and micro-siting, and the provisions of this environmental authorisation. The EMPr must be made available for comments by registered Interested and Affected Parties and the holder of this environmental authorisation must consider such comments. Once amended, the final EMPr must be submitted to the Department for written approval prior to commencement of the activity. Once approved the EMPr must be implemented and adhered to”.*

Therefore, since the proposed project is part of a suite of developments that is declared a SIP, as described above, and since construction of the proposed facilities needs to commence as soon as possible, the EMPr for Gemsbok Solar PV5 project needs to be approved by the DFFE before financial close can be reached and construction commences. It was confirmed with the DFFE via email dated 25 February 2021, that the EMPr can be made available to registered Interested and Affected Parties (I&APs) for a 30-day comment period and that the DFFE will take 30 days to make a decision. It is understood that such approval will also be expedited considering that the proposed project is categorized as a SIP.

Furthermore, Condition 13 of the EA for Gemsbok Solar PV5 (14/12/16/3/3/2/843) states the following:

- “A copy of the final development layout map must be made available for comments by registered Interested and Affected Parties and the holder of this environmental authorisation must consider such comments. Once amended, the final development layout map must be submitted to the Department for written approval prior to commencement of the activity. All available information must be used in the finalisation of the layout map. Existing infrastructure must be used as far as possible e.g. roads”.

In order to comply with the above, the final development layout map has been included as Appendix B of Part 1 of the EMPr.

This EMPr for the Gemsbok Solar PV5 project consists of three parts, each of which covers specific project aspects and infrastructure, as indicated in Figure 2 below. This serves as **Part 3 of the EMPr, which covers the 132 kV power line from the Gemsbok Solar PV5 facility to the Gemsbok Solar PV2 Switching Station, which will then connect to the Eskom Nieuwehoop MTS.**

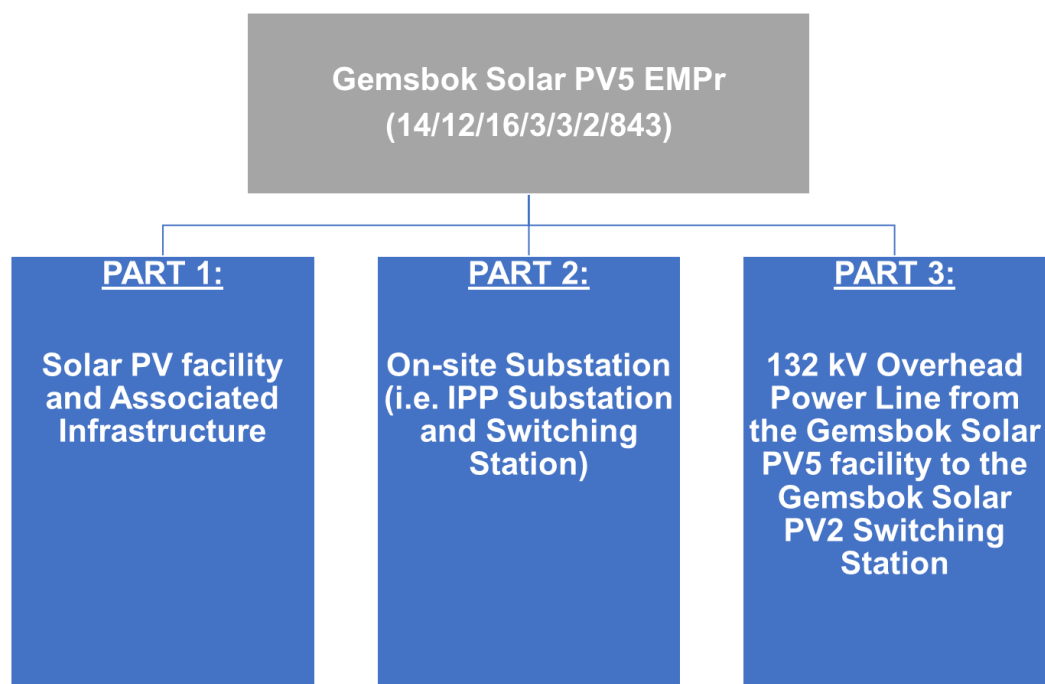


Figure 2: Parts of the Gemsbok Solar PV5 EMPr

This EMPr and final development layout map is therefore currently being released to I&APs, stakeholders and Organs of State for a 30-day review period extending from 30 April 2021 to 31 May 2021. Comments received from stakeholders during this aforementioned review period will be incorporated into the EMPr, where relevant and required. Following the incorporation of comments from I&APs, stakeholders and Organs of State, this EMPr and final development layout map will be submitted to the DFFE for approval in order to comply with Conditions 12 and 14 of the EA. Once approved, the EMPr is intended as a “living” document and should continue



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to be updated regularly, as needed, following the relevant EMPr update requirements of the EA and the 2014 NEMA EIA Regulations (as amended).

## 1.2 AUTHORS OF THE EMPr

This EMPr is based on the original EMPr that was compiled in March 2015 as part of the EIA Process. The authors of the original EMPr are noted in Table 2 below. All updates to the EMPr have been made by the current Environmental Assessment Practitioners (Paul Lochner, Lizande Kellerman, Kelly Stroebel and Rohaida Abed) and Ms. Ina Venter, the appointed Biodiversity Specialist, as indicated in Table 2. The details and expertise of the Environmental Assessment Practitioners and the specialists are provided in Appendix A of Part 1 of the EMPr.

**Table 2: Details of the EMPr Update Team**

NAME	ORGANISATION	ROLE
<b>EIA TEAM OF THE ORIGINAL EIA (MARCH 2015)</b>		
Environmental Assessment Practitioners		
Paul Lochner	CSIR	Technical Advisor and Quality Assurance (EAPSA) Certified
Minnelise Levendal	CSIR	Project Leader
Surina Brink (Laurie)	CSIR <sup>2</sup>	Project Manager
Specialists		
Lukas Niemand	Pachnoda Consulting CC and associates	Ecological Impact Assessment (including fauna and avifauna). Pachnoda Consulting compiled the overall Ecological Impact Assessment with inputs from Kyllinga Consulting as indicated below)
Ina Venter	Kyllinga Consulting (sub-contracted by Pachnoda Consulting CC)	Vegetation and Aquatic Impact Assessment
Henry Holland	Private	Visual Impact Assessment
Dr. Jayson Orton	ASHA Consulting (Pty) Ltd	Heritage Impact Assessment (Archaeology and Cultural Landscape)
Dr. John Almond	Natura Viva cc	Desktop Palaeontological Impact Assessment
Johann Lanz	Private	Soils and Agricultural Potential Assessment
Rudolph du Toit	CSIR <sup>2</sup>	Socio-Economic Impact Assessment
Technical Studies to inform the EIA Process		
P. S. van der Merwe and A. J. Otto	MESA Solutions	Radio Frequency Interference (RFI) and Electromagnetic Interference (EMI)
<b>EIA TEAM OF THE EMPr UPDATE (APRIL 2021)</b>		
Environmental Assessment Practitioners		
Paul Lochner ( <i>Registered EAP (2019/745)</i> )	CSIR	Project Leader
Kelly Stroebel ( <i>Cand.Sci.Nat</i> )	CSIR	Project Manager
Rohaida Abed ( <i>Pr.Sci.Nat.</i> )	CSIR	Project Member
Lizande Kellerman ( <i>Pr.Sci.Nat.</i> )	CSIR	Project Specialist
Abulele Adams ( <i>Pr.Sci.Nat.</i> )	CSIR	Project Mapping
Specialists		
Ina Venter	Kyllinga Consulting	Vegetation and Aquatic Specialist

<sup>2</sup> This project team member is no longer with the CSIR.

### **1.3 PROJECT DESCRIPTION**

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As indicated above, the Gemsbok Solar PV5 project will generate 75 MW Alternating Current (AC) of electricity. This project will connect to the Eskom Nieuwehoop MTS via a 132 kV overhead transmission line via the Gemsbok Solar PV2 project. The proposed solar facility and associated infrastructure requires a development area of approximately 220 ha. The site will comprise of the following components:

- Solar Field:
  - Solar Arrays: rows of PV Modules; Single Axis Tracking structures at roughly 3m height aligned North South which are drilled and piled into the ground; Solar Module Mounting structures comprised of Galvanised Steel and Aluminium; and Solar measuring station.
  - Building infrastructure: Offices; Operational and Maintenance control centre; Warehouse/workshop; Ablution facilities for operations with permeant septic tank; Inverter stations with associated combiner boxes; MV transformers; cabling; scada weather stations; store rooms; Converter station; On-site worker's accommodation camp, Substation building; and Guard House.
- Associated infrastructure
  - **132 kV overhead transmission line** (Steel Monopole design); On-site 132/33kV Independent Power Producer (IPP) Substation to be constructed and operated by the IPP, back-to-back with a 132kV 3 bay Switching Station to be constructed by the IPP and handed over to Eskom for operations; Additional 132kV Feeder Bay at the Gemsbok Solar PV2 Switching Station; Additional feeder bay and Busbar at the Eskom Nieuwehoop MTS or extensions of the existing infrastructure; A new 400/132kV transformer bay at the Eskom Nieuwehoop MTS; 400/132kV Transformer at the Eskom Nieuwehoop MTS; Extension of the 400kV busbar; Extension of the 132kV Busbar; 33 kV internal transmission lines - overhead powerlines and underground cables; <8 m wide internal access road; Fencing; Temporary work area during the construction phase; Main Gate, Parking area; Laydown areas; Canteen; Chemical based temporary ablutions for construction; Water storage tanks, Boundary fence (electrical or barbed wire) around the PV facility; Stormwater infrastructure including storm water channels exceeding 1 km in length; and Water pipelines.

A high level conceptual diagram, indicating the key electrical components and overall linkages between the Gemsbok Solar PV2, Gemsbok Solar PV5 and Gemsbok Solar PV6 projects, is provided in Figure 3.

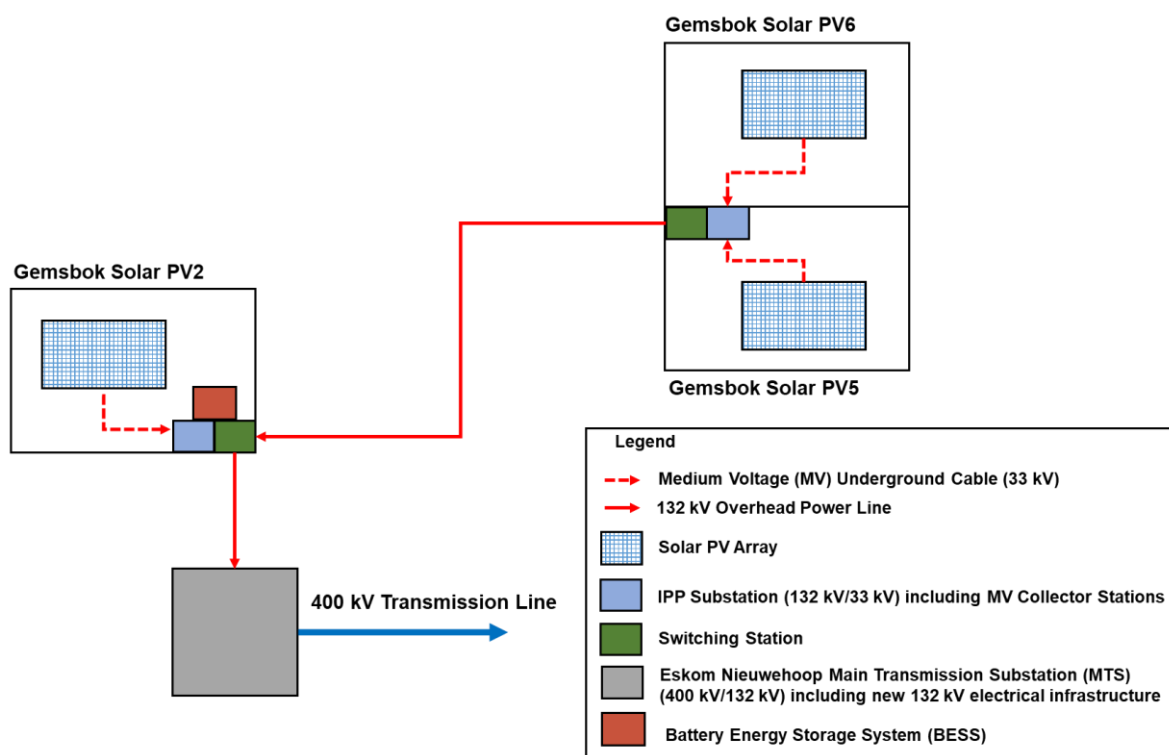


Figure 3: High-level conceptual diagram showing the key electrical components and linkages between the Gemsbok Solar PV2, Gemsbok Solar PV5 and Gemsbok Solar PV6 projects.

This part of the EMPr (i.e. Part 3) only addresses the overhead power line that will extend from the on-site substation at the Gemsbok Solar PV5 facility to the Gemsbok Solar PV2 Switching Station, which will then connect to the Eskom Nieuwehoop MTS.

The project can be divided into three main phases:

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

Each activity undertaken as part of the above phases may have environmental impacts and, where applicable, has been assessed in the specialist studies undertaken during the EIA Phase. Management and mitigation measures required to address all the impacts associated with the proposed power line are included within this EMPr. Construction is planned to start in August 2021, and will take up to 18 months to be completed.

The main activities that will form part of the construction phase for the power line are:

- Transportation of personnel, construction material and equipment to the site, and personnel away from the site;
- Construction of the site camp and laydown areas, as well as dedicated access routes from the laydown areas to the working areas;
- Vegetation clearing in the areas required for building infrastructure;

- Excavations for infrastructure and associated infrastructure;
- Establishment of a laydown area for equipment;
- Construction of internal access roads, where required;
- Stockpiling of soil and cleared vegetation; and
- Construction of the power lines and additional infrastructure.

The following activities will occur during the operational phase for the power line are:

- The transmission of electricity generated by the proposed solar facility to the Eskom Nieuwehoop MTS; and
- Maintenance of the infrastructure.

During the life span of the proposed project (approximately 20 years each), on-going maintenance will be required on a scheduled basis.

Should it be decided not to extend the operational lifespan of the project beyond 20 years, the project will be decommissioned. The main aim of decommissioning is to return the land to its original, pre-construction condition, where possible.

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## **1.4 ENVIRONMENTAL SENSITIVITIES**

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The following key recommendations were made within the various specialist studies undertaken during the EIA Phase:

- Apply appropriate buffer zones to sensitive habitat types and sensitive features:
  - 100 m from National Freshwater Ecosystem Protection Area (NFEPA) rivers and wetlands (National priority);
  - 32 m from all other major watercourses (e.g. *Prosopis glandulosa*) where waterbirds could congregate when surface water is present;
  - 20 m from minor drainage lines;
  - 100 m from watering points and dams;
  - 100 m from prominent quartz outcrops and koppies and *Aloe dichotoma* outcrops;
  - 20 m from Protected trees (e.g. *Aloe dichotoma*, *Boscia albitrunca* and *B. foetida*);
- No development can be allowed to take place within the High sensitivity areas or buffer zones. Development within Moderate to High sensitivity areas should be limited and must avoid protected plant species (e.g. *Aloe dichotoma*, *Boscia albitrunca* and *B. foetida*) with a buffer of 20 m. If not possible, all individuals of these species impacted on site must be relocated to suitable habitat in the area. All relevant permits pertaining to the removal and transplanting of the protected species on site must be obtained from the relevant authorities before construction commences.
- Avoid development on habitat with High sensitivity and buffer zones or align along existing infrastructure;
- Avoid where possible construction at or in close proximity to sensitive areas during the months of August - November when most korhaan, bustard and lark species are breeding. These areas include prominent outcrops, quartz outcrops and dolerite gravel plains, optimal forging habitat used by threatened and near threatened species) and optimal breeding habitat and at areas where these birds were observed;

- Should it not be possible to avoid the significant archaeological sites with a minimum buffer of 20 m from the waypoints, then they should be excavated; and
- The possible graves should be avoided with a buffer of at least 5 m or else tested and, if necessary, exhumed prior to construction with approval from the South African Heritage Resources Agency (SAHRA).

The above key recommendations have been taken into consideration and adhered to during compilation of the final development layout (Appendix B of Part 1 of the EMPr).

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## **2 APPROACH TO PREPARING THE EMPr**

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### **2.1 COMPLIANCE WITH RELEVANT LEGISLATION**

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NEMA requires that an EMPr be submitted where a Basic Assessment or EIA is being undertaken for an Application for EA. The content of an EMPr must either contain the information set out in Appendix 4 of the 2014 NEMA EIA Regulations (as amended) promulgated in Government Gazette 40772 and GN R326 on 7 April 2017, or must be a generic EMPr relevant to an application as identified and gazetted by the Minister in a government notice. As part of the 2016 EGI SEA, a generic EMPr was also compiled for the development and expansion of (a) overhead electricity transmission and distribution infrastructure; and (b) substation infrastructure for the transmission and distribution of electricity. On 2 March 2018, these two Generic EMPrs were gazetted in Government Gazette 41473, GN 162 and GN 163, for public comment for a period of 45 days. **On 22 March 2019, these two Generic EMPrs were gazetted for implementation, in Government Gazette 42323, GN 435.** Parts 2 and 3 of this EMPr therefore subscribes to the requirements of the gazetted EMPrs (Gazette 42323, GN 435). Part 3 (i.e. this section), specifically complies with the Generic EMPr for power line infrastructure.

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

- **Section 1 of Part B of the gazetted Generic EMPr** contains a **pre-approved template** with aspects that are common to the development of power line infrastructure. **This section will be completed by the contractor, with each completed page signed and dated by the holder of the EA prior to commencement of the activity.** This section will not be submitted to the DFFE as it has already been pre-approved and gazetted. To allow I&APs access to the pre-approved EMPr template for consideration through the public review process, the template is included in Appendix B of this EMPr (i.e. Part 3 of the EMPr, this document) and can be viewed by I&APs.
- **Section 2 of Part B of the gazetted Generic EMPr has been completed to include site specific information**, a final infrastructure layout and development footprint site map, and a declaration that the Applicant will comply with the pre-approved template provided in Part B: Section 1 of the gazetted EMPr. This will be submitted to the DFFE for review and decision-making and has been included in **Section 4 (site specific information), Section 5 (final infrastructure layout) and Section 6 (declaration of the Applicant) of this EMPr.**
- **Part C of the gazetted Generic EMPr** has been compiled and included in **Section 7 of this EMPr.** It includes site specific impact management outcomes and impact management

actions that are not included in the pre-approved generic EMPr. It will be submitted to the DFFE, for consideration of, and decision on, the EMPr. This section has been prepared by the EAP, with input from relevant specialists. This section of the EMPr is a supplement to the gazetted EMPr and provides site specific mitigation measures identified in the specialist studies included in the Final EIA Report.

## **2.2 STRUCTURE AND CONTENTS OF THE EMPr**

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This Site Specific EMPr includes the following:

- Section 4: Site specific information;
- Section 5: Final infrastructure layout and development footprint site map;
- Section 6: Declaration that the Applicant will comply with the pre-approved template provided in Part B: Section 1 of the gazetted EMPr (which is included in Appendix B of this EMPr (i.e. Part 3 of the EMPr, this document);
- Section 7: Site-Specific EMPr as required by Part C of the gazetted EMPr.

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

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

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

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

The overall EIA for the Gemsbok Solar PV5 facility assessed a larger area (275 ha and greater). The footprint of the PV facility is approximately 220 ha and EGI corridor is approximately 300 m wide, and is referred to as the PV5 project site. In this EMPr, for the power line to support the PV5 facility, the following spatial parameters apply to the management actions, unless where specified differently:

- The assessed transmission corridor as shown in Figure 1.

### **3 ROLES AND RESPONSIBILITIES**

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Since the Generic EMPs are applicable for the on-site substations and power lines, it is best to adopt the definitions of the roles and responsibilities as captured in the gazetted EMPs of GN 435. This will allow consistency of the management of the project from an environmental perspective and will avoid any contradiction in terms of the roles and responsibilities.

The generic roles and responsibilities required for key role players are those of the:

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

The definitions of the roles and responsibilities are included in Appendix A of this EMP (i.e. Part 3 of the EMP, this document).

The EA dated 19 November 2018 stipulates the following requirements and responsibilities of the ECO:

ECO Duties:

- Condition 25: The holder of this EA must appoint an independent and experienced ECO for the construction phase of the development that will have the responsibility to ensure that the mitigation/rehabilitation measures and recommendations referred to in this EA are implemented and to ensure compliance with the provisions of the approved EMP.
  - Condition 25.1: The ECO must be appointed before commencement of any authorised activities.
  - Condition 25.2: Once appointed, the name and contact details of the ECO must be submitted to the Director: Compliance Monitoring of the DFFE.
  - Condition 25.3: The ECO must keep record of all activities on site, problems identified, transgressions noted and a task schedule undertaken by the ECO.
  - Condition 25.4: The ECO must remain employed until all rehabilitation measures, as required for implementation due to construction damage, are completed and the site is ready for operation.

Recording and Reporting to the Department:

- Condition 26: All documentation e.g. audit/monitoring/compliance reports and notifications, required to be submitted to the Department in terms of this EA, must be submitted to the Director: Compliance Monitoring of the Department.
- Condition 27: The holder of the EA must, for the period during which the EA and EMP remain valid, ensure that project compliance with the conditions of the EA and the EMP are audited, and that the audit reports are submitted to the Director: Compliance Monitoring of the Department.

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- Condition 28: The frequency of auditing and of submission of the environmental audit reports must be as per the frequency indicated in the approved EMPr, taking into account the processes for such auditing as prescribed in Regulation 34 of GN R.982.
- Condition 29: The holder of the authorisation must, in addition, submit environmental audit reports to the Department within 30 days of completion of the construction phase (i.e. within 30 days of the site handover) and a final environmental audit report within 30 days of completion of rehabilitation activities.
- Condition 30: The environmental audit reports must be compiled in accordance with Appendix 7 of the EIA Regulations, 2014 and must indicate the date of the audit, the name of the auditor and the outcome of the audit in terms of compliance with the EA conditions as well as the requirements of the approved EMPr.
- Condition 31: Records relating to monitoring and auditing must be kept on site and made available for inspection to any relevant and competent authority in respect of this development.



## 4 SITE SPECIFIC INFORMATION

### 4.1 CONTACT DETAILS AND DESCRIPTION OF THE PROJECT

#### 4.1.1 Details of the Applicant

<b>Name of Applicant</b>	<ul style="list-style-type: none"> <li>Original Applicant: Gemsbok Solar PV5 (Pty) Ltd</li> <li>Amended Applicant: Mulilo Total Coega (Pty) Ltd</li> </ul> <p><b>Note from the CSIR:</b> As discussed above, there is a process currently underway to apply for an amendment to the EA to change the Project Applicant from <i>Gemsbok Solar PV5 (Pty) Ltd</i> to <i>Mulilo Total Coega (Pty) Ltd</i>. The Application for Amendment to the EA was submitted to the DFFE on 15 April 2021, and it is expected that a decision will be made by 17 May 2021.</p>
<b>Name of Applicant Representative</b>	Warren Morse
<b>Telephone Number:</b>	0216853240
<b>Fax Number:</b>	-
<b>Postal Address:</b>	PO Box 548, Howard Place, 7450
<b>Physical Address:</b>	Top Floor Golf Park 4, Raapenberg Rd, Mowbray

Note: Should the EA be transferred to a new holder, such as Eskom, this section must be completed by the new holder and submitted with the application for an amendment of the EA in terms of the EIA Regulations.

#### 4.1.2 Details and Expertise of the EAP

<b>Company of the EAP</b>	Council for Scientific and Industrial Research (CSIR)
<b>Name of EAP</b>	Kelly Stroebel
<b>Telephone Number:</b>	082 660 1907 021 888 2432 021 888 2400
<b>Fax Number:</b>	021 888 2693
<b>Email Address:</b>	KStroebel@csir.co.za
<b>Expertise of the EAP (Curriculum Vitae included):</b>	<p><b>Qualifications:</b></p> <ul style="list-style-type: none"> <li>BSc (Hons) Environmental Science, Rhodes University</li> </ul> <p><b>Experience:</b></p> <ul style="list-style-type: none"> <li>Kelly has more than 7 years of experience in environmental assessment and management.</li> </ul> <p><b>Professional Registration and Affiliations:</b></p> <ul style="list-style-type: none"> <li>Registered Candidate Natural Scientist with the South African Council for Natural Scientific Professions (Registration Number: 100151/14).</li> <li>International Association for Impact Assessment, South African Affiliate (Membership Number: 3588).</li> </ul> <p><b>Curriculum Vitae of Kelly Stroebel is included in Appendix A of Part 1 of the EMPr.</b></p>

#### 4.1.3 Project Name

<b>Project Name</b>	Gemsbok Solar PV5 75 MW Solar Photovoltaic Facility on the Remaining Extent of Portion 3 (Rooidam) of the Farm Gemsbok Bult No. 120, near Kenhardt, Northern Cape
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#### 4.1.4 Description of the Project

Refer to Section 1.3 of this EMPr for a detailed description of the proposed project.

#### 4.1.5 Project Location

The proposed power line for the Gemsbok Solar PV5 facility will be constructed on the following farm portions:

NUMBER	FARM NAME	FARM NUMBER	PORTION NAME	PORTION NUMBER	LATITUDE (Y) (Mid-point of power line per farm portion)	LONGITUDE (X) (Mid-point of power line per farm portion)
1	Remaining Extent of Portion 3 (Rooidam) of the Farm Gemsbok Bult No. 120	120	REMAINING EXTENT OF A PORTION	3	29°7'46.81"S	21°22'12.13"E
2	Remaining Extent of Portion 8 (Rooidam) (a Portion of Portion 3) of the Farm Gemsbok Bult No. 120	120	REMAINING EXTENT OF A PORTION	8	29°6' 27.84"S	21°23'54.20"E

#### 4.1.6 Technical Specification of the Overhead Power Lines

Length	Approximately 8.3 km (to Gemsbok PV2 Switching Station)
Tower Parameters – 132 kV Power Line Steel monopole, twin Tern conductor	
Number and Types of Towers	Steel monopole, 2WT1295 (Refer to Appendix C of this EMPr (i.e. Part 3) for a general arrangement of the structure)
Tower Spacing (mean and maximum)	Approximate average spacing 107m; approximate maximum spacing 220m (dependent on Eskom requirements)
Tower Height (lowest, mean and height)	16m / 23m / 25m
Conductor Attachment Height (mean)	16m – 20.8m
Minimum Ground Clearance	6.5m (Structures on elevated Railway - refer to wayleave diagram in Appendix C of the EMPr (i.e. Part 3))
<b>Component</b>	<b>Description/Dimensions</b>
<b>Height of pylons</b>	Maximum of 25 m high
<b>Corridor within which to construct the Overhead Power Line (OHPL)</b>	200 m corridor (i.e., 100 m on either side of the proposed OHPL)
<b>Area occupied by pylon servitude</b>	The pylon servitude width will be approximately 31 m (132 kV) wide
<b>Transmission capacity</b>	Up to 132 kV
<b>Area occupied by both permanent and construction laydown areas</b>	Approximately 2 Hectare (ha)
<b>Area occupied by buildings</b>	Approximately 2 Hectare (ha)

<b>Length of service road</b>	Approximately 2.5 km
<b>Width of service road</b>	Approximately 8 m
<b>Height of fencing</b>	No fencing for OHPL
<b>Type of fencing</b>	No fencing for OHPL

## **5 FINAL DEVELOPMENT LAYOUT AND DEVELOPMENT FOOTPRINT SITE MAP**

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This section includes maps of sensitivities, as well as the final infrastructure layout. Feature and sensitivity maps were prepared as part of the EIA Phase and used to inform the final development layout.

The area to which this EMPr applies is the assessed transmission corridor shown in Figure 1.

Refer to Appendix D of Part 1 of the EMPr for the combined sensitivity and layout map for the proposed power line.

## **6 APPLICANT DECLARATION**

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### **PROJECT APPLICANT DECLARATION**

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

Signature Proponent/Applicant/Holder of EA

Date:



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30 April 2021

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## 7 PROJECT SPECIFIC EMPr

### 7.1 ALIEN INVASIVE PLANT MANAGEMENT PLAN

Impact Management Outcomes: Avoid establishment and spread of alien invasive plants due to the project activities within the assessed transmission line corridor as shown in Figure 1, and within the laydown area required for the construction of the power line. Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to operations.						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<b>PLANNING AND DESIGN PHASE</b>						
<ul style="list-style-type: none"> <li>▪ Compile an alien and invasive plant species control and monitoring plan as required in the Alien and Invasive Species Regulations under the National Environmental Management Biodiversity Act (Act 10 of 2004) (NEM: BA), as well as in terms of the Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA).</li> <li>▪ <u>Note</u> that the only invasive plant species recorded on site during the field surveys for vegetation assessment in December 2015 is <i>Prosopis glandulosa</i>, which is mainly confined to the large watercourses (or drainage lines) on site and which should be avoided by the development where possible. It is however possible that new alien or invasive plant species may become established on site as a result of the construction activities on site. Species that may potentially occur on site include <i>Agave sisalana</i> (Class 2), <i>Atriplex inflata</i> (Class 1b), <i>Atriplex nummularia</i> (Class 2), <i>Datura</i> species (Class 1b) and <i>Xanthium</i> species (Class 1b).</li> <li>▪ Ensure compliance with relevant Environmental Specifications for the control and removal of alien invasive plant species.</li> <li>▪ Appoint a specialist or contact relevant authorities to seek guidance on the removal of the alien vegetation on site (i.e. within the assessed transmission line corridor as shown in Figure 1, and within the laydown</li> </ul>	Project Developer and ECO	<p>Ensure that this is done and taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.</p> <p>Appoint a suitable specialist / Contractor or contact the relevant authorities to seek guidance on the removal of the alien invasive plant species from within the assessed transmission line corridor as shown in Figure 1 and laydown area for the power line</p>	Once-off during the design phase	Project Developer and ECO	Once-off during the design phase	Approved plan in place and ready for auditing, with approval kept on file.

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**Impact Management Outcomes: Avoid establishment and spread of alien invasive plants due to the project activities within the assessed transmission line corridor as shown in Figure 1, and within the laydown area required for the construction of the power line. Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to operations.**

Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<p>area required for the construction of the power line).</p> <ul style="list-style-type: none"> <li>Compile and finalise an alien weed eradication programme.</li> </ul>		<p>construction.</p> <p>Appoint a suitable specialist to compile an alien invasive vegetation eradication plan for the assessed transmission corridor, including laydown area needed for the power line construction.</p>				
<b>CONSTRUCTION PHASE</b>						
<ul style="list-style-type: none"> <li>Appoint a specialist or contractor to undertake a sweep and survey of the final development footprint site (i.e. within the assessed transmission line corridor as shown in Figure 1, and within the laydown area required for the construction of the power line), with an alien invasive plant eradication team to remove exotic vegetation prior to the commencement of construction.</li> </ul>	Project Developer ECO, Specialist and Contractor	Appoint a suitable vegetation contractor to inspect the site (i.e. within the assessed transmission line corridor as shown in Figure 1, and within the laydown area required for the construction of the power line) and remove any exotic weeds prior to the commencement of construction. ECO to ensure that this is taken into	Prior to the commencement of construction	Project Developer and ECO	Once-off during the design phase	Approved plan in place and ready for auditing, with approval kept on file. Verification of removed alien vegetation.

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
		consideration and implemented.				
<ul style="list-style-type: none"> <li>▪ Establish an ongoing monitoring programme for the construction phase to detect and quantify any alien invasive plant species that may become established within the site<sup>3</sup> and identify the problem species (as per CARA and NEM: BA).</li> <li>▪ Prepare monitoring programme which will monitor the presence of these alien invasive plant species on the site<sup>3</sup>. Monitor the presence of alien invasive plants during the construction phase within the site<sup>3</sup> via visual inspections and take action to remove and control these species. If any alien invasive plant species are detected within the site<sup>3</sup>, then the distribution of these should be mapped (GPS co-ordinates of concentrations of plants). The results should be interpreted in terms of the risk posed to sensitive habitats within and surrounding the project area.</li> </ul>	ECO and Contractor	Mapping alien invasive plant species within the site <sup>3</sup> in terms of distribution and record number of individuals.  ECO to ensure that this is taken into consideration and implemented.	When required i.e. when such species are found	ECO	When required i.e. when such species are found	Monitoring report compiled with the alien invasive plant species recorded and mapped.
<ul style="list-style-type: none"> <li>▪ Ensure that alien invasive vegetation found on site<sup>3</sup>, within the proposed project footprint<sup>3</sup>, is immediately controlled and removed promptly, in a scheduled manner throughout the construction phase. The removal of alien vegetation on site during the construction phase should use registered control methods and take into consideration the Alien and Invasive Species Regulations published in terms of Section 97(1) of the NEM: BA, if applicable. Control measures include the following:                             <ul style="list-style-type: none"> <li>○ Mechanical control:                                     <ul style="list-style-type: none"> <li>▪ Physical removal of alien or invasive seedlings by means of hand-pulling or with hand tools such as</li> </ul> </li> </ul> </li> </ul>	ECO and Contractor	Mapping alien invasive plant species within the site <sup>3</sup> in terms of distribution and record number of individuals.  ECO to ensure that this is taken into consideration and implemented.	When required i.e. when such species are found	ECO	When required i.e. when such species are found	Monitoring report compiled with the alien invasive plant species recorded and mapped.

<sup>3</sup> This means within the assessed transmission line corridor as shown in Figure 1, and within the laydown area required for the construction of the power line.

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> <li>forks, hoes or shovels (mainly seedlings);</li> <li> <ul style="list-style-type: none"> <li>▪ Using a tree-popper or physically removing an entire tree; and</li> <li>▪ Felling of large trees with or without ringbarking.</li> </ul> </li> <li>○ Herbicide control (organic if possible);</li> <li>○ Veld management:                             <ul style="list-style-type: none"> <li>▪ Fire regimes; and</li> <li>▪ Grazing cycles.</li> </ul> </li> </ul>						
<ul style="list-style-type: none"> <li>▪ The removed alien invasive vegetation should be immediately disposed at a suitable waste disposal facility and should not be kept on site for prolonged periods of time, as this will enhance the spread of these species.</li> </ul>	ECO Contractor and	Monitor the removal of the alien vegetation found on site <sup>4</sup> via visual inspections. Clearing of alien invasive plant species found on site and disposal at a suitable and registered disposal facility.	When required i.e. when such species are found	ECO	When required i.e. when such species are found	Proof of disposal (waste disposal slips or waybills) should be obtained and retained on file for auditing purposes.
<ul style="list-style-type: none"> <li>▪ Erosion and sediment control measures must be in place at all areas cleared of alien invasive plant species.</li> </ul>	ECO Contractor and	Revegetate all areas bare of vegetation following the removal of alien invasive plants with local indigenous vegetation as soon as possible.	On-going during the construction phase	ECO	When required	Proof of visual inspection retained on file.

<sup>4</sup> This means within the assessed transmission line corridor as shown in Figure 1, and within the laydown area required for the construction of the power line.

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> <li>Ensure proper management of soil stockpiles. Do not import soil stockpiles from areas with alien invasive plants to ensure proper management of stockpiles.</li> </ul>	ECO and Contractor	<p>Inspect imported soil stockpiles for alien invasive plants before being placed on site.</p> <p>Monitor the presence of alien invasive plants during the construction phase via visual inspections and take action to remove and control these species.</p>	<p>When required i.e. when imported soil stockpiles are being ordered and delivered</p> <p>On-going</p>	ECO	<p>When required i.e. when imported soil stockpiles are being ordered and delivered</p> <p>Ongoing</p>	Proof of visual inspection retained on file.
<ul style="list-style-type: none"> <li>Undertake rehabilitation of disturbed areas as soon as possible after construction. The shallow topsoil layer must be stockpiled separately from the subsoil layers, should the excavations exceed 0.5 m. When the construction has been completed, the topsoil layers, which contain seed and vegetative material, should be reinstated last to allow plants to rapidly re-colonise the bare soil areas. Stockpile the topsoil layer separately and used on site following the construction phase.</li> </ul>	ECO and Contractor	Establish an effective record keeping system for each area where soil is disturbed for constructional purposes.	Daily (stockpiling) and once-off for the reinstatement of the topsoil layer	ECO and Contractor	Daily (stockpiling) and once-off for the reinstatement of the topsoil layer	Proof of visual inspection retained on file.
<ul style="list-style-type: none"> <li>No exotic plants may be used for rehabilitation purposes. Only indigenous plants occurring within a ten (10) kilometre radius of the development site must be utilized.</li> </ul>	ECO and Contractor	Revegetate all areas bare of vegetation with local indigenous vegetation (as described) as soon as possible.	On-going during the construction phase	ECO	When required	Proof of visual inspection retained on file.



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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<b>OPERATIONAL PHASE</b>						
<ul style="list-style-type: none"> <li>Continue with on-going monitoring programme to detect and quantify any alien invasive plant species that may become established and identify the highly invasive species during the operation phase within the assessed transmission line corridor. If any alien invasive plant species are detected then the distribution of these should be mapped (GPS co-ordinates of concentrations of plants). The results should be interpreted in terms of the risk posed to sensitive habitats within and surrounding the project area.</li> </ul>	Project Developer and Environmental Manager	Mapping alien invasive plant species within the site <sup>5</sup> in terms of distribution and record number of individuals.  Annual audit of project area and immediate surroundings.	Annual audits	Project Developer and Environmental Manager	When required i.e. when such species are found	Monitoring report compiled with the alien invasive plant species recorded and mapped.
<ul style="list-style-type: none"> <li>Immediately control any alien invasive plants that become established within the site<sup>4</sup> using registered control methods. Use of herbicides and undertake manual removal of alien vegetation on site where this may arise. Regular address and redress of weeds identified on site by a suitable contractor. The clearance of exotic weed to be undertaken bi-annually at a minimum and on a needs basis at an intermittent level.</li> </ul>	Project Developer and Environmental Manager	Monitor the use of herbicide sprays and manual removal of alien vegetation by undertaking visual inspections and reporting any non-compliance.  Maintain register of weed spraying activities and ensure that herbicide use is recorded.	Bi-annual audits	Project Developer and Environmental Manager	Bi-annual audits	Monitoring report compiled with the alien invasive plant species recorded and mapped.
<b>DECOMMISSIONING PHASE</b>						
<ul style="list-style-type: none"> <li>Exotic weed control measures to be instituted through weed control programme within the assessed transmission line corridor as shown in</li> </ul>	Project Developer	Compile weed eradication	Weed eradication exercise to be	ECO	Monthly	Inspections and audit reports compiled and

<sup>5</sup> This means within the assessed transmission line corridor as shown in Figure 1.

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
Figure 1, and within the laydown area required for the decommissioning of the power line). Regular redress of exotic weed through the use of herbicide and manual removal.	Project Developer	programme for a period of 12 months after the decommissioning exercise.	undertaken every 6 months for a period of 12 months following decommissioning.			kept on file, with non-compliance reported.
	Environmental Manager and Specialist / Contractor	Appoint contractor to undertake the weed eradication programme.	Prior to the commencement of the decommissioning phase.			
	Environmental Manager and Specialist / Contractor	Monitor newly disturbed areas where infrastructure has been removed within the transmission line corridor to detect and quantify any alien invasive plant species that may become established after decommissioning and rehabilitation.	Once-off			
		Final external audit of the assessed transmission line corridor as shown in Figure 1, and within the laydown area	Once-off			

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
		required for the decommissioning of the power line, to confirm that area is free of alien invasive plants after 5 years.				

## 7.2 PLANT RESCUE AND PROTECTION PLAN INCLUDING RE-VEGETATION AND HABITAT REHABILITATION PLAN

**Impact Management Outcomes: Minimise loss of natural vegetation. Prevent impacts on natural vegetation in sensitive habitats and Species of Special Concern (SSC). Minimise the loss of seed bank present within the soil. Ensure effective topsoil covering to conserve soil fertility on all disturbed areas, after they have been rehabilitated.**

Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<b>PLANNING AND DESIGN PHASE</b>						
<ul style="list-style-type: none"> <li>The footprint of the development must be limited to the areas required for actual construction works and operational activities. Vegetation clearing must be limited to the required footprint for actual construction works and operational activities. Mitigation measures must be implemented to reduce the risk of erosion and the invasion of alien species.</li> </ul>	Project Developer	Ensure that this is taken into consideration in the design	Once-off during the design phase	ECO	Once-off prior to commencement	Signed off and approved designs that limit development footprint and vegetation clearing.
<ul style="list-style-type: none"> <li>A pre-construction survey of the final development footprint must be conducted by a qualified floral specialist to ascertain the identity and the exact number of individuals of protected species affected by the proposed development. Prior to the commencement of construction, a</li> </ul>	Project Developer and ECO / Specialist	Review the findings of the Specialist Assessments and consider legislative	Once-off during the planning and design phase, prior to the	ECO	Once-off during the planning and design phase, prior to the	Permits obtained, verified and kept on file. Verify that this has been undertaken by

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<p>rescue and rehabilitation operation for these species which could survive translocation must be conducted.</p> <ul style="list-style-type: none"> <li>Ensure the necessary permits or licenses are identified and applied for as applicable for removal of indigenous vegetation, especially for protected species. The destruction or disturbances of individual trees such as <i>Aloidendron dichotomum</i> (previously <i>Aloe dichotoma</i>), <i>Boscia albitrunca</i>, <i>Boscia foetida</i> and <i>Vachellia erioloba</i>, as well as individuals of the succulents <i>Hoodia gordonii</i> and <i>Hoodia officinalis</i>, should any of the above occur on site, must be avoided during the construction of the power line. Alternatively, permits for the rescue i.e. removal and translocation of any of these protected species must be applied for and granted by the relevant authority.</li> <li>Await response and provision of permit (as required) from the relevant Authorities prior to the removal of the indigenous species (if required). Once these permits are obtained, search and rescue must be undertaken for the relevant indigenous species. It is advised that translocation of relevant plants should happen at any appropriate Provincial Nature Reserve in the Northern Cape and / or the Karoo Desert National Botanical Garden at Worcester in the Western Cape.</li> </ul>	Contractor	<p>requirements in respect of loss of indigenous and protected vegetation etc.</p> <p>Review the approved site plan with the ECO and appoint a suitable terrestrial ecologist to undertake a walk-through of the final site layout.</p> <p>Contact the relevant Provincial and National Environmental Authorities to discuss and confirm if any protected species need to be relocated or rescued, and undertake the required permit application processes.</p> <p>Appoint a suitable Search and Rescue Specialist / Contractor to undertake plant</p>	commencement of construction		commencement of construction	<p>reviewing approved permits.</p> <p>Visual evidence of search and rescue i.e. photographs</p>

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
		search and rescue.  Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.				
<ul style="list-style-type: none"> <li>▪ Consideration of the siting and layout of all project structures and infrastructure, including powerlines to avoid highly sensitive areas as identified in the Specialist studies (Chapter 8 for the Vegetation and Wetlands study, Chapter 8 for the Avifaunal study and Chapter 9 for the faunal study). Also refer to the sensitivity maps and layouts (Appendix B, Appendix C and Appendix D of Part 1 of the EMPr).</li> <li>▪ Avoid major drainage lines during the design and layout of the proposed PV facility. A buffer of 32 m from mayor drainage lines must be applied. Ensure that sensitive habitat and features (as defined in the Vegetation and Wetland Impact Assessment as well as the Avifaunal Assessment, Chapters 8 and 9 respectively of the EIA Report; Appendix B, Appendix C and Appendix D of Part 1 of the EMPr) are considered in the design.</li> <li>▪ Incorporate minor drainage lines into design and avoid unnecessary disturbance, where applicable. Refer to the Vegetation and Wetlands Impact Assessment, Chapter 8 of the EIA Report (which includes the buffers from minor drainage lines, i.e. 20 m), and Appendix B, Appendix C and Appendix D of Part 1 of the EMPr).</li> <li>▪ A buffer zone of 32 m must be implemented from the edge of the major drainage lines on site (as shown in Appendix B, Appendix C and</li> </ul>	Project Developer	Ensure that this is taken into consideration in the design	Once-off during the design phase	ECO	Once-off prior to commencement	Signed off and approved designs that avoids sensitive areas.

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<p>Appendix D of Part 1 of the EMPr), in which no development or activities should take place. A buffer of 20 m should be applied to the minor drainage lines on site</p> <ul style="list-style-type: none"> <li>▪ Adhere to the buffer specifications in the Avifauna impact assessment (Chapter 9 of the EIA Report):                             <ul style="list-style-type: none"> <li>○ Apply a buffer of 32 m from major drainage lines.</li> <li>○ Apply a buffer of 100 m from sensitive areas, including dams and watering points.</li> <li>○ Apply a buffer of 100 m from prominent outcrops, quartz outcrops and dolerite gravel plains)</li> <li>○ If any breeding or nesting bird of prey is encountered during the construction phase, it must be buffered by at least 500 m.</li> <li>○ All bustard / Korhaan observations should be buffered by 250 m.</li> </ul> </li> </ul>						
<ul style="list-style-type: none"> <li>▪ Install Bird Flight Diverters across power lines at appropriate points.</li> </ul>	Project Developer and ECO	Identify appropriate points within infrastructure for the installation of Bird Flight Diverters.  Verify that this is undertaken by reviewing the signed approved designs.	Once off	Project Developer	Once off during the design phase	Final designs approved and kept on file
<b>CONSTRUCTION PHASE</b>						
<ul style="list-style-type: none"> <li>▪ Areas outside of the footprint, including sensitive areas and buffer areas, must be clearly demarcated (using fencing and appropriate</li> </ul>	Project Developer	Ensure that this is taken into	Once-off prior to the	ECO	Monthly	Inspections and audit reports compiled and

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
signage) before construction commences and must be regarded as “no-go” areas. Contractors and construction workers must be clearly informed of the “no-go” areas.		consideration before construction commences	commencement of construction and ensure that it is maintained throughout construction			kept on file, with non-compliance reported.
<ul style="list-style-type: none"> <li>Before the clearing of the site, the appropriate permits must be obtained from the Department of Forestry, Fisheries and the Environment (DFFE) for the removal of tree species listed in the National Forest Act, and from the relevant provincial department for the destruction of plant species protected in terms of the specific provincial legislation. No construction activities can commence without having obtained the necessary permits for threatened or protected species (ToPS) listed and provincially protected species within the study area. Copies of the permits must be kept by the ECO.</li> </ul>	Project Developer and Contractor	Ensure that the permits are applied for as relevant prior to the construction phase	Once-off during the planning and design phase	ECO, Contractor and Project Developer	Once-off during the planning and design phase	Permits obtained, verified and kept on file. Verify that this has been undertaken by reviewing approved permits.
<ul style="list-style-type: none"> <li>The Contractors and construction personnel must be made aware that indigenous vegetation must not be removed or damaged; this includes succulents (e.g. <i>Hoodia gordonii</i>, <i>Hoodia officinalis</i>, <i>Euphorbia ssp.</i>, <i>Mesembryanthemum ssp.</i>) and the protected quiver tree, <i>Aloidendron dichotomum</i>.</li> <li>Educate construction workers about the biodiversity importance of the area by means of environmental awareness programmes.</li> </ul>	Contractor / ECO ECO ECO	Carry out Environmental Awareness Training. Conduct audits of the signed attendance registers. Issue fines where relevant as per specifications in their contracts.	Once-off training and ensure that all new staff is inducted. Monthly During construction phase	ECO	Monthly	Attendance registers of the environmental awareness training kept on file
<ul style="list-style-type: none"> <li>The staff should be educated not to collect and harvest plants or veldkos and not to collect firewood.</li> </ul>	ECO and Contractor	Ensure that staff are given induction and environmental awareness training to discuss these aspects.	Once-off and upon new staff being appointed	ECO	Monthly	Attendance registers of the environmental awareness training kept on file

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<b>Impact Management Actions</b>	<b>Implementation</b>			<b>Monitoring</b>		
	<b>Responsible Person</b>	<b>Method of Implementation</b>	<b>Timeframe for Implementation</b>	<b>Responsible Person</b>	<b>Frequency</b>	<b>Evidence of Compliance</b>
		New staff must also be inducted. Ensure that environmental awareness programmes are implemented				
<ul style="list-style-type: none"> <li>▪ Undertake rehabilitation of disturbed areas as soon as possible after construction. Stockpile the shallow topsoil layer separately from the subsoil layers. Reinststate the topsoil layers (containing seed and vegetative material) when construction is complete to allow the plants to rapidly re-colonise the bare soil areas. Re-seed with locally-sourced seed of indigenous grass species that were recorded on site during the pre-construction phase. Re-seed with locally-sourced seed of indigenous grass species that were recorded on site during the pre-construction phase.</li> </ul>	ECO Contractor and	Establish an effective record keeping system for each area where soil is disturbed for constructional purposes.	Daily (stockpiling) and once-off for the reinstatement of the topsoil layer	ECO Contractor and	Daily (stockpiling) and once-off for the reinstatement of the topsoil layer	Proof of visual inspection retained on file.
<b>OPERATIONAL PHASE</b>						
<ul style="list-style-type: none"> <li>▪ The collection, hunting or harvesting of any plants, any protected trees, fuel wood or animals at the site should be strictly forbidden and the staff educated to prevent this from happening.</li> <li>▪ Staff must remain within the boundaries of the power line maintenance at all times. The undeveloped portions of the site must be treated as “no-go” areas.</li> </ul>	Environmental Manager	Ensure that staff are given induction and environmental awareness training to discuss these aspects. New staff must also be inducted.	Once-off and upon new staff being appointed	Environmental Manager	Monthly	Attendance registers of the environmental awareness training kept on file
<ul style="list-style-type: none"> <li>▪ Adhere to the buffer specifications in the Vegetation and Wetlands impact assessment (Chapter 8 of the EIA Report):                             <ul style="list-style-type: none"> <li>○ Apply a buffer of 32 m from major drainage lines.</li> <li>○ Apply a buffer of 20 m from minor drainage lines.</li> </ul> </li> </ul>	Environmental Manager	Audits to ensure that the specified buffers are adhered to.  Monitor the activities via visual inspections, and record and report	At the beginning of the operational phase	Environmental Manager	At the beginning of the operational phase, once-off	Inspections and audit reports compiled and kept on file, with non-compliance reported.



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<b>Impact Management Actions</b>	<b>Implementation</b>			<b>Monitoring</b>		
	<b>Responsible Person</b>	<b>Method of Implementation</b>	<b>Timeframe for Implementation</b>	<b>Responsible Person</b>	<b>Frequency</b>	<b>Evidence of Compliance</b>
		any non-compliance.				
<ul style="list-style-type: none"> <li>Management of vegetation at an optimum level of growth and height is required.</li> <li>Identify protocol for pruning of vegetation and clearance where required.</li> </ul>	Environmental Manager	Identify means of pruning and clearance of vegetation. For example, brushcutters, grazing, etc.	Ongoing and as required	Environmental Manager	Weekly	Records of erosion kept on file (e.g. photographs, documents)
<ul style="list-style-type: none"> <li>Re-vegetation of disturbed surfaces must occur immediately after construction activities are completed. Allow natural vegetation recruitment from the topsoil unless the vegetation cover is insufficient. Re-seed with locally-sourced seed of indigenous grass species that were recorded on site pre-construction or by using a commercial seed mix indigenous to the area.</li> </ul>	Botanist rehabilitation specialist or	Compare vegetation establishment on rehabilitated areas to surroundings natural vegetation.	At the end of the growing season and then as recommended by the specialist	Environmental Manager	Weekly	Audit report kept on file, including, where possible, photographic evidence, as well as proof of appointment of specialist on file.
<ul style="list-style-type: none"> <li>Undertake maintenance of rehabilitated areas in accordance with the rehabilitation and landscaping plan.</li> </ul>	Environmental Manager	Monitor topsoil removal and rehabilitation activities, and record and report non-compliance.	Weekly or Monthly	Environmental Manager	Weekly or Monthly	Audit report kept on file, including, where possible, photographic evidence,
<b>DECOMMISSIONING PHASE</b>						
<ul style="list-style-type: none"> <li>All damaged areas shall be rehabilitated upon completion of the contract.</li> <li>All natural areas must be rehabilitated with species indigenous to the area. Re-seed with locally-sourced seed of indigenous grass species that were recorded on site pre-construction.</li> <li>Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas.</li> <li>Disturbed and transformed areas should be contoured to avoid lines</li> </ul>	Project Developer with feedback and input from an appropriate specialist. with advice from specialist	Final external audit of area to confirm that area is rehabilitated to an acceptable level	Once off	Environmental Manager	Annually	Report compiled to include evidence of acceptable rehabilitation

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
and forms that will contrast with the existing landscapes.						

### 7.3 OPEN SPACE MANAGEMENT PLAN, FAUNAL MANAGEMENT AND AVIFAUNAL COLLISION RISK MANAGEMENT

Impact Management Outcomes: The reduction in the impact that barrier will have on animal movement within the area, and to reduce impacts on fauna as a result of the project. Reduce effects of the intrusion of power lines on views of sensitive visual receptors. Avoid or reduce bird collisions with or due to infrastructure related to the project.						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<b>PLANNING AND DESIGN PHASE</b>						
<ul style="list-style-type: none"> <li>Ensure compliance with relevant Environmental Specifications for the control and removal of alien invasive plant species.</li> <li>Appoint a specialist or contact relevant authorities to seek guidance on the removal of the alien vegetation on site.</li> <li>Compile and finalise an alien weed eradication programme.</li> </ul>	Project Developer and ECO	<p>Appoint a suitable specialist / Contractor or contact the relevant authorities to seek guidance on the removal of the planted alien invasive plant species.</p> <p>Appoint a suitable specialist to compile an alien invasive vegetation eradication plan.</p> <p>Ensure that this is taken into</p>	Once off	Project Developer	Once off during the design phase	Approved plan in place and ready for auditing, with approval kept on file.

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
		consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.				
<ul style="list-style-type: none"> <li>Bird flight diverters should be installed on the overhead power lines where known flight paths of birds occur.</li> </ul>	Project Developer	Identify appropriate points within infrastructure for the installation of Bird Flight Diverters.  Verify that this is undertaken by reviewing the signed approved designs.	Once off	Project Developer	Once off during the design phase	Final designs approved and kept on file
<b>CONSTRUCTION PHASE</b>						
<ul style="list-style-type: none"> <li>Bird flight diverters should be installed on the overhead power lines where known flight paths of birds occur.</li> </ul>	ECO and Contractor	It is recommended that the ECO notes down birds observed in the area and flight paths during the construction phase to determine where these bird flight diverters should be installed, and the devices installed.	Weekly monitoring of bird flight paths and installation of bird flight diverters as when required.	ECO	Weekly monitoring	Audit report kept on file

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
		Verify whether these have been installed by inspecting the site prior to commencement of the operational phase.				
<ul style="list-style-type: none"> <li>Watercourses outside the approved footprint / layout must be treated as “no-go” areas and appropriately demarcated as such. No vehicles, machinery, personnel, construction material, fuel, oil, bitumen or waste must be allowed into these areas without the express permission of and supervision by the ECO, except for rehabilitation work in these areas.</li> </ul>	Project Developer	Ensure that this is taken into consideration by undertaking site visits and inspections	Throughout the construction phase	ECO	Monthly	Audit report kept on file, including photographic evidence
<ul style="list-style-type: none"> <li>Any fauna directly threatened by the construction activities should be removed to a safe location by a suitably qualified person.</li> </ul>	Project Developer and ECO	Ensure that this is taken into consideration during construction and that a suitably qualified specialist is appointed to remove such fauna, when required	Throughout construction when required	ECO	When required	Audit report kept on file, including, where possible, photographic evidence and confirmation of removal to a safe location
<ul style="list-style-type: none"> <li>The hunting and trapping of animals on-site or in the adjacent area should be strictly forbidden. Fines must be issued for non-compliance as specified in their contracts.</li> <li>Conduct an Environmental Awareness Training and induction for all construction staff and personnel.</li> </ul>	ECO and Contractor	Ensure that staff are given induction and environmental awareness training to discuss these aspects. New staff must also be inducted.	Once-off and upon new staff being appointed	ECO	Monthly	Attendance registers of the environmental awareness training kept on file
<ul style="list-style-type: none"> <li>Establish a recording method in order to monitor the construction activities, including species presence within site, mortalities and</li> </ul>	ECO	Establish database of species, sightings etc.	During the construction phase	ECO	Monthly	Audit report kept on file, including, where

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> <li>sittings. This is in order to identify any faunal mortalities and record the details (such as the reason, spatial extent etc.) in order to avoid repetition of fatality.</li> </ul>		Construction personnel should advise on the findings and presence of fauna on site.	(daily to monthly)			possible, photographic evidence and confirmation of removal to a safe location
<ul style="list-style-type: none"> <li>Appoint a Specialist to conduct an inspection of the final project layout and sweep or inspect the site for any fauna, once the fencing is complete (i.e. the established site should be flushed to ensure any large wildlife is not contained within the fenced area). Appoint a small team to flush wildlife during the early evening. Game should be flushed by driving a team through the gated facility towards the exit.</li> </ul>	ECO and Project Developer	Team to flush game as required.  ECO to monitor flushing process and record any incidents or non-compliance.	Once off prior to commencement of construction and thereafter if required.	ECO	When required	Audit report kept on file, including, where possible, photographic evidence, as well as proof of appointment of specialist on file.
<ul style="list-style-type: none"> <li>Monitor trenches at the start and end of each working day to check if any small animals are trapped.</li> </ul>	ECO and Contractor	Ensure that this is taken into consideration by undertaking site visits and inspections	Throughout the construction phase	ECO	Daily	Audit report kept on file, including photographic evidence
<ul style="list-style-type: none"> <li>No animals (including snakes) shall be killed on site. The appointed ECO must receive snake handling training to enable him or her to remove and relocate any poisonous snakes during the construction phase. An expert or a suitable specialist should be appointed to remove and relocate any poisonous snakes during the construction phase, when required.</li> </ul>	Project Developer, ECO and Contractor	Ensure that staff are given induction and environmental awareness training to discuss these aspects. New staff must also be inducted.  Ensure that the ECO receives adequate training to handle snakes.	Once-off and upon new staff being appointed  Once-off and as required thereafter  As required during construction	ECO	Monthly	Attendance registers of the environmental awareness training kept on file  Confirmation of training on handling of snakes kept on file  Appointment letters of specialists kept on file

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
		Ensure that specialist snake experts are appointed when needed				
<ul style="list-style-type: none"> <li>The construction personnel and staff should be made aware of the presence of fauna within the proposed project area. The construction personnel and staff must also be made aware of the general speed limits on site and must be alert at all times for potential crossings.</li> </ul>	ECO and Contractor	Ensure that staff are given induction and environmental awareness training to discuss these aspects. New staff must also be inducted.	Once-off and upon new staff being appointed	ECO	Monthly	Attendance registers of the environmental awareness training kept on file
<ul style="list-style-type: none"> <li>Ensure that the live electrical fence wire is not placed at ground level.</li> <li>Conduct inspections of the fence line to address any animals that may be affected by the fence.</li> </ul>	Project Developer / Contractor	Daily to monthly record keeping. A register of all faunal sightings indicating date of siting; species affected; position of species (specific or indicative) and other observations should be established	Conduct regular (daily) inspections of the fence line to address any animals that may be affected by the fence.	ECO	Monthly	Proof of inspections and records kept on file.
OPERATIONAL PHASE						
<ul style="list-style-type: none"> <li>The impact on birds must be monitored by an environmental staff member during the first six months of the operational phase.</li> </ul>	Project Developer	Record any evidence of bird collisions, injury or other bird-related incidents (with GPS coordinates).  Where necessary, a	Weekly for the first month, thereafter, monthly	Project Developer	Weekly for the first month, thereafter, monthly	Report compiled to include evidence of bird collisions, injury or other bird-related incidents (with GPS coordinates)

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
		bird specialist should oversee the recording and reporting of incidents, help with species identification, assess the significance of any impacts, and if required, suggest mitigation.				
<ul style="list-style-type: none"> <li>▪ Annual monitoring by an avifaunal specialist. This should be based on a minimum of 3-5 days observations.</li> </ul>	Avifauna Specialist	Undertake site inspections and record findings. Monitor the flight paths of birds occurring on site, noting which birds are seen	Annually	Environmental Manager and Avifauna Specialist	Annually	Report compiled to include evidence of birds found
<ul style="list-style-type: none"> <li>▪ Any avian mortality or injury along the route should be duly recorded and reported.</li> </ul>	Project Developer	Record any bird fatalities and undertake the necessary reporting to relevant authority.	When required	Project Developer	Annual reporting	Report compiled to include evidence of bird mortality and injury
<ul style="list-style-type: none"> <li>▪ The relevant requirements and methodology for post construction bird monitoring in terms of the applicable and most recent Best Practice Guideline at the time, e.g. "Birds and Solar Energy, Best Practice Guidelines" must be adhered to.</li> </ul>	Project Developer	Ensure that the relevant requirements for the post-construction bird monitoring in terms of the applicable Birds and Solar Energy Best Practice Guidelines	As prescribed in the relevant Guidelines	Project Developer	When required	Report compiled to include evidence of post-construction monitoring requirements

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Impact Management Outcomes: The reduction in the impact that barrier will have on animal movement within the area, and to reduce impacts on fauna as a result of the project. Reduce effects of the intrusion of power lines on views of sensitive visual receptors. Avoid or reduce bird collisions with or due to infrastructure related to the project.						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
		are adhered to.				
<ul style="list-style-type: none"> <li>▪ Prior to the commencement of the operational phase, the Project Developer and the landowner need to reach a decision in terms of the allowance of faunal activities or redress of faunal activities within site.</li> <li>▪ Identify points of frequent faunal activity and impact on operations. Undertake monitoring of faunal activities within the site and the immediate proximity of the site.</li> </ul>	Environmental Manager	Establish reporting procedure.  Monitor the presence of fauna during the operational phase via visual inspections and site visits.	As required	Environmental Manager	As required	Report compiled to include evidence of faunal activity
<ul style="list-style-type: none"> <li>▪ The operational personnel and staff should be made aware of the presence of fauna within the proposed project area. The operational personnel and staff must also be made aware of the general speed limits on site and must be alert at all times for potential crossings.</li> </ul>	Environmental Manager	Ensure that staff are given induction and environmental awareness training to discuss these aspects. New staff must also be inducted.	Once-off and upon new staff being appointed	Environmental Manager	As required during maintenance	Attendance registers of the environmental awareness training kept on file
DECOMMISSIONING PHASE						
<ul style="list-style-type: none"> <li>▪ Disturbed and transformed areas should be contoured to approximate naturally occurring slopes to avoid lines and forms that will contrast with the existing landscapes</li> <li>▪ Stockpiled topsoil should be reapplied to disturbed areas and these areas should be re-vegetated using a mix of native species in such a way that the areas will form as little contrast in form, line, colour and texture with the surrounding undisturbed landscape.</li> <li>▪ Edges of re-vegetated areas should be feathered to reduce form and line contrasts with surrounding undisturbed landscape.</li> </ul>	Project Developer	Final external audit of area to confirm that area is rehabilitated to an acceptable level	Once off	Environmental Manager	Annually	Report compiled to include evidence of acceptable rehabilitation



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**7.4 TRAFFIC MANAGEMENT AND TRANSPORTATION PLAN**

<b>Impact Management Outcomes: Manage impact that additional traffic generation will have on road network. Limit the deterioration of surface road condition. Minimise the impact of the construction, operation and decommissioning activities on the local traffic and avoid accidents with pedestrians, animals and other drivers on the surrounding tarred / gravel roads. Limit the release of noise, pollutants and dust emissions.</b>						
<b>Impact Management Actions</b>	<b>Implementation</b>			<b>Monitoring</b>		
	<b>Responsible Person</b>	<b>Method of Implementation</b>	<b>Timeframe for Implementation</b>	<b>Responsible Person</b>	<b>Frequency</b>	<b>Evidence of Compliance</b>
<b>PLANNING AND DESIGN PHASE</b>						
<ul style="list-style-type: none"> <li>Should abnormal loads have to be transported by road to the site, a permit needs to be obtained from the Provincial Government Northern Cape (PGNC) Department of Public Works, Roads and Transport.</li> </ul>	Project Developer and Contractor	Ensure that the permits are applied for as relevant prior to the construction phase	Once-off during the planning and design phase	ECO, Contractor and Project Developer	Once-off during the planning and design phase	Permits obtained, verified and kept on file. Verify that this has been undertaken by reviewing approved permits.
<ul style="list-style-type: none"> <li>If the Transnet Service Road will be used as the designated access road to site, discussions must be held with Transnet Freight Rail prior to commencement to confirm requirements and details of the agreement.</li> <li>Ensure that the requirements for use of the Transnet Service Road are addressed and considered in the design, as and where applicable.</li> </ul>	Project Developer and Contractor	Ensure that discussions are held between the relevant parties and agreements reached prior to the construction phase	Once-off during the planning and design phase	ECO, Contractor and Project Developer	Once-off during the planning and design phase	Proof of discussions and agreements recorded, verified and kept on file. Verify that this has been undertaken by reviewing approved minutes of meetings and agreements
<ul style="list-style-type: none"> <li>If the Transnet Service Road will be used as the designated access road, the registration details of all vehicles that will make use of the road during the construction and operational phases must be provided to Transnet Freight Rail, in order to obtain official permits.</li> </ul>	Project Developer and Contractor	Ensure that the permits are applied for as relevant prior to the construction phase	Once-off during the planning and design phase	ECO, Contractor and Project Developer	Once-off during the planning and design phase	Permits obtained, verified and kept on file. Verify that this has been undertaken by reviewing approved permits.
<ul style="list-style-type: none"> <li>Provide a Transport Traffic Plan to the South African National Roads Agency Limited (SANRAL), if required.</li> </ul>	Contractor and ECO	Ensure that the plan is compiled and submitted prior to commencement	Once-off during the planning and design phase	ECO and Project Developer	Once-off during the planning and design phase	Approved plan kept on file. Verify that this has been undertaken by

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
						reviewing approved plans.
<ul style="list-style-type: none"> <li>A Road Maintenance Plan should be developed for the section of the Transnet Service Road that will be used or the unnamed farm road should that be used. The plan should address the requirements of Transnet Freight Rail, including but not limited to, grading, dust suppressant mechanisms, drainage, signage, and speed limits.</li> </ul>	Project Developer, Contractor and ECO	Ensure that the plan is compiled and submitted prior to commencement.	Once-off during the planning and design phase.	ECO and Project Developer	Once-off during the planning and design phase	Approved plan kept on file. Verify that this has been undertaken by reviewing approved plans.
CONSTRUCTION PHASE						
<ul style="list-style-type: none"> <li>Well maintained vehicles should be used together with well-trained drivers during the construction phase. Vehicle maintenance and driver competency should be monitored. Proof of driver competency as well as the vehicle checks should be verified and undertaken to ensure that vehicles are roadworthy and hence, do not pose a safety risk. The Contractors must ensure that construction vehicles are roadworthy, properly serviced and maintained, and respect the vehicle safety standards implemented by the Project Developer.</li> </ul>	Contractor and ECO	Carry out random checks of driver licenses and conduct random visual inspections of construction vehicles for roadworthiness.	Random visual inspection of vehicles weekly.	ECO	Weekly	Reports to document vehicle conditions kept on file and monitored.
<ul style="list-style-type: none"> <li>During the construction phase, suitable parking areas should be designated for trucks and vehicles.</li> </ul>	Project Developer and ECO	Monitor the placement of the designated parking area for trucks and vehicles via visual inspections and record and report any non-compliance.	Once-off prior to construction and as required during the construction phase.	ECO and Contractor	Once-off prior to construction and as required during the construction phase.	Visual inspections and site photographs
<ul style="list-style-type: none"> <li>The use of public transport (buses and / or minibus taxis) to convey construction personnel to the site should be encouraged.</li> </ul>	Appointed Contractor	Contractor may record arrival and departure times as well as number of workers	Once a month on a randomly selected day.	ECO	On-going	Report compiled to include evidence of use of public transport

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
		using minibuses.				
<ul style="list-style-type: none"> <li>Vehicles must not carry loads in excess of those for which the vehicle is in order to reduce impacts on the road structures, particularly the access roads leading to the site. Random visual inspection of vehicles should be undertaken in order to monitor for overloading. The inspections should also verify if the trucks are covered with appropriate material (such as tarpaulin) if and where possible.</li> </ul>	Appointed Contractor	Perform visual inspection of vehicles during the construction phase.	Random visual inspection of vehicles weekly.	ECO	Random visual inspection of vehicles weekly.	Report compiled to include evidence of use of load carrying of vehicles
<ul style="list-style-type: none"> <li>Road kill monitoring programme (inclusive of wildlife collisions record keeping) should be established and a product such as Animex fences installed, if needed, to direct animals to safe road crossings.</li> </ul>	Contractor and ECO	Appropriate monitoring should be undertaken and Animex fences installed, if needed to direct animals to safe road crossings	Weekly	ECO	Throughout construction	Reports to document road kill are kept on file and monitored.
<ul style="list-style-type: none"> <li>Adhere to all speed limits applicable to all roads used. All heavy load vehicles maintain a speed limit of 40 km/hour in proposed section of the Transnet Service Road.</li> </ul>	Contractor and ECO	Ensure that speed limits are adhered to.  Carry out random visual inspections to verify speed limits and general awareness of vehicle drivers.	Daily  Random during the construction phase	ECO	Throughout construction	Reports to document speed limits are kept on file and monitored.
<ul style="list-style-type: none"> <li>Implement clear and visible signage and signals indicating movement of vehicles at the intersection with the Transnet Service Road to ensure safe entry and exit.</li> </ul>	Contractor and ECO	Implement clear signalisation.  Carry out random inspections to verify whether proper construction signage is being implemented.	On-going  Random during the construction phase	ECO	Throughout construction	Reports to document implementation of signage are kept on file and monitored.

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> <li>The access road should be inspected on a weekly basis for structural damage.</li> </ul>	Contractor and ECO	Ensure that the road maintains current condition through photographic surveys and monitoring	Weekly	ECO	Throughout construction	Reports to document road condition are kept on file and monitored.
<ul style="list-style-type: none"> <li>Implement management strategies for dust generation e.g. apply dust suppressant on the Transnet Service Road, exposed areas and stockpiles.</li> </ul>	Contractor and ECO	Ensure dust management measures are in place to adequately decrease the generation of dust.	On-going	ECO	On-going	Approved strategies kept on file. Verify that this has been undertaken by reviewing approved plans.
<ul style="list-style-type: none"> <li>Make provision for the repairing of subgrade deterioration (i.e. pot holes, dust holes) that could possibly result due to loading of heavy construction vehicles on the Transnet Service Road.</li> </ul>	Contractor and ECO	Make provision for repairs required to road	Agree to with Transnet	ECO	On-going	Approved repair strategies kept on file. Verify that this has been undertaken by reviewing approved plans.
<ul style="list-style-type: none"> <li>Construction vehicles must have their lights on at all times. Lights to be properly set to not blind train drivers who may then miss important signals, e.g. stop signal (Signal Passed At Danger (SPAD))</li> </ul>	Contractor and ECO	Ensure lights are on and properly set by undertaking random visual inspections	On-going	Contractor and ECO	On-going	Reports to document outcome of visual inspections of vehicle are kept on file and monitored.
<ul style="list-style-type: none"> <li>Postpone or reduce dust-generating activities during periods with strong wind. Earthworks may need to be rescheduled or the frequency of application of dust control / suppressant increased.</li> </ul>	Contractor and ECO	Ensure dust management measures are in place to decrease the dust generated	On-going	ECO	Throughout construction	Reports to document re-scheduling of earthworks or frequency adjustment of dust control are kept on file and

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
						monitored.
<b>OPERATIONAL PHASE</b>						
<ul style="list-style-type: none"> <li>Well maintained vehicles should be used together with well-trained drivers during the operational phase, as required. Vehicle maintenance and driver competency should be monitored. Proof of driver competency as well as the vehicle checks should be verified and undertaken to ensure that vehicles are roadworthy and hence, do not pose a safety risk. Vehicles must be roadworthy, properly serviced and maintained.</li> </ul>	Project Developer	Carry out random checks of driver licenses and conduct random visual inspections of construction vehicles for roadworthiness.	Random visual inspection of vehicles weekly.	Environmental Manager	Weekly	Reports to document vehicle conditions kept on file and monitored.
<ul style="list-style-type: none"> <li>Adhere to all speed limits applicable to all roads used. All heavy load vehicles maintain a speed limit of 40 km/hour in proposed section of the Transnet Service Road.</li> </ul>	Project Developer	Ensure that speed limits are adhered to.  Carry out random visual inspections to verify speed limits and general awareness of vehicle drivers.	Daily  Random during the operational phase	Environmental Manager	Throughout operations	Reports to document speed limits are kept on file and monitored.
<ul style="list-style-type: none"> <li>Implement clear and visible signage and signals indicating movement of vehicles at the intersection with the Transnet Service Road to ensure safe entry and exit.</li> </ul>	Project Developer	Implement clear signalisation.  Carry out random inspections to verify whether proper signage is being implemented.	On-going  Random during the construction phase	Environmental Manager	Throughout operations	Reports to document implementation of signage are kept on file and monitored.
<ul style="list-style-type: none"> <li>The use of public transport (buses and / or minibus taxis) or carpooling to convey operational personnel to the site should be encouraged.</li> </ul>	Project Developer	Record arrival and departure times as well as number of	Once a month on a randomly selected day.	Environmental Manager	On-going	Report compiled to include evidence of use of public transport

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
		workers using minibuses.				
<ul style="list-style-type: none"> <li>Unnecessary impacts on surrounding natural vegetation must be avoided. All operational and maintenance vehicles to remain on the roads and no driving off road allowed.</li> </ul>	Project Developer	Strict control over the behaviour of operational workers, restricting activities to within demarcated areas	On-going when maintenance work is being undertaken	Environmental Manager	Monthly	Inspections and audit reports compiled and kept on file, with non-compliance reported.
<ul style="list-style-type: none"> <li>Vehicle drivers shall drive at moderate speed on site access roads to minimise or eliminate dust generation.</li> </ul>	Project Developer	Ensure generation of dust to an adequate level during operational activities	On-going when maintenance work is being undertaken	Environmental Manager	Monthly	Inspections and audit reports compiled and kept on file, with non-compliance reported.
<ul style="list-style-type: none"> <li>Adhere to requirements made within Transport Traffic Plan and Road Maintenance Plan</li> </ul>	Project Developer	Monitor the requirements as set out in the Plan as ensure that it is adhered to	On-going	Environmental Manager	On-going	Report compiled to include evidence of acceptable road maintenance and traffic management
<ul style="list-style-type: none"> <li>Limit access to the site to personnel.</li> </ul>	Project Developer	Maintain register of people entering site and restrict access to personnel.	On-going	Environmental Manager	On-going	Report compiled to include evidence of access control to site
<ul style="list-style-type: none"> <li>The access road should be inspected on a weekly basis for structural damage.</li> </ul>	Project Developer	Ensure that the road maintains current condition through photographic surveys and monitoring	Weekly	Environmental Manager	On-going	Reports to document road condition are kept on file and monitored.

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> <li>Implement management strategies for dust generation e.g. apply dust suppressant on the Transnet Service Road, exposed areas and stockpiles.</li> </ul>	Project Developer	Ensure dust management measures are in place to adequately decrease the generation of dust.	On-going	Environmental Manager	On-going	Approved strategies kept on file. Verify that this has been undertaken by reviewing approved plans.
<ul style="list-style-type: none"> <li>Vehicles must not carry loads in excess of those for which the vehicle is in order to reduce impacts on the road structures, particularly the access roads leading to the site. Random visual inspection of vehicles should be undertaken in order to monitor for overloading (where applicable).</li> </ul>	Project Developer	Perform visual inspection of vehicles	Random visual inspection of vehicles weekly.	Environmental Manager	Random visual inspection of vehicles weekly.	Report compiled to include evidence of use of load carrying of vehicles
<ul style="list-style-type: none"> <li>Make provision for the repairing of subgrade deterioration (i.e. pot holes, dust holes) that could possibly result due to loading of heavy vehicles on the Transnet Service Road.</li> </ul>	Project Developer	Make provision for repairs required to road	Agree to with Transnet	Environmental Manager	On-going	Approved repair strategies kept on file. Verify that this has been undertaken by reviewing approved plans.
<b>DECOMMISSIONING PHASE</b>						
<ul style="list-style-type: none"> <li>Implement measures documented during the construction phase.</li> </ul>	Implement measures documented during the construction phase.	Implement measures documented during the construction phase.	Implement measures documented during the construction phase.	Implement measures documented during the construction phase.	Implement measures documented during the construction phase.	Implement measures documented during the construction phase.

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**7.5 EROSION MANAGEMENT PLAN**

<b>Impact Management Outcomes: Prevent wind erosion and resultant deposition of dust on the surrounding indigenous vegetation. Prevent loss of natural vegetation through erosion. Minimise habitat fragmentation and loss of connectivity.</b>						
<b>Impact Management Actions</b>	<b>Implementation</b>			<b>Monitoring</b>		
	<b>Responsible Person</b>	<b>Method of Implementation</b>	<b>Timeframe for Implementation</b>	<b>Responsible Person</b>	<b>Frequency</b>	<b>Evidence of Compliance</b>
<b>CONSTRUCTION PHASE</b>						
<ul style="list-style-type: none"> <li>Sand, stone and cement should be stored in demarcated areas, and covered or sealed to prevent wind erosion and resultant deposition of dust on the surrounding indigenous vegetation.</li> </ul>	ECO and Contractor	Undertake regular inspections of the via site audits to verify that sand, stone and cement are stored and handled as instructed.	Daily	ECO	Weekly	Inspections and audit reports compiled and kept on file, with non-compliance reported.
<ul style="list-style-type: none"> <li>Vegetation clearing during construction must be restricted to the footprint of the proposed project components and planned infrastructure only. It should be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time.</li> </ul>	ECO and Contractor ECO	Monitor vegetation clearing throughout the construction phase via visual site inspections. Record non-compliance and incidents.  Undertake regular monitoring for erosion to ensure is reduced and rectified as soon as possible.	Daily Daily	ECO	Weekly	Inspections and audit reports compiled and kept on file, with non-compliance reported.
<ul style="list-style-type: none"> <li>The shallow topsoil layer must be stockpiled separately from the subsoil layers, should the excavations exceed 0.5 m. When the construction has been completed, the topsoil layers, which contain seed and vegetative material, should be reinstated last to allow plants to rapidly re-colonise the bare soil areas.</li> </ul>	ECO and Contractor	Establish an effective record keeping system for each area where soil is disturbed for constructional purposes.	Daily (stockpiling) and once-off for the reinstatement of the topsoil layer	ECO and Contractor	Daily (stockpiling) and once-off for the reinstatement of the topsoil layer	Proof of visual inspection retained on file.
<ul style="list-style-type: none"> <li>Identify cause of erosion and possible means of redress (i.e. implement erosion control measures, where applicable), such as the</li> </ul>	ECO and Project	Monitor the erosion on site during	Ongoing and as required during	ECO and Project	Ongoing and as required during	Proof of visual inspection retained on



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<b>Impact Management Outcomes: Prevent wind erosion and resultant deposition of dust on the surrounding indigenous vegetation. Prevent loss of natural vegetation through erosion. Minimise habitat fragmentation and loss of connectivity.</b>						
<b>Impact Management Actions</b>	<b>Implementation</b>			<b>Monitoring</b>		
	<b>Responsible Person</b>	<b>Method of Implementation</b>	<b>Timeframe for Implementation</b>	<b>Responsible Person</b>	<b>Frequency</b>	<b>Evidence of Compliance</b>
<p>use of geofabric, stone gabions and re-vegetation or similar measures.</p> <ul style="list-style-type: none"> <li>Erosion control measures should seek to reduce surface flow velocity and allow for settlement on site of silt laden surface waters. Washaways, excessive loss of soils and gulleys can be considered to be indicative of excessive erosion.</li> <li>Remove the topsoil from the proposed tower base locations and store it temporarily for later use.</li> <li>Use the subsoil for shaping during the reinstatement phase and place topsoil on top.</li> <li>Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the run-off control system and to specifically record the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.</li> </ul>	Developer	<p>construction, as well as the implementation and effectiveness of erosion control on site (such as the use of geofabric, stone gabions and re-vegetation or similar measures).</p> <p>Monitor all disturbed areas and new vehicle tracks on site for signs of erosion.</p> <p>Establish an effective record keeping system for each area where soil is disturbed for construction and decommissioning purposes.</p>	erosion events.	Developer	erosion events.	file.
<b>OPERATIONAL PHASE</b>						
<ul style="list-style-type: none"> <li>The use of silt fences and sand bags must be implemented in areas that are susceptible to erosion. Other erosion control measures that can be implemented are as follows: 1) Brush packing with cleared vegetation, 2) Planting of vegetation, 3) Hydro-seeding / hand sowing. All erosion control mechanisms need to be regularly maintained.</li> </ul>	Project Developer	Monitor efficiency of erosion control measures	Weekly or monthly	Environmental Manager	Weekly or monthly	Inspections and audit reports compiled and kept on file, with non-compliance reported.
<ul style="list-style-type: none"> <li>Conduct regular monitoring for erosion to ensure that no erosion problems are occurring at the site as a result of the roads and other infrastructure. Ensure that all erosion problems are rectified as soon as</li> </ul>	Project Developer	Undertake regular monitoring for erosion to ensure is reduced and rectified as soon	Monthly	Environmental Manager	Monthly	Inspections and audit reports compiled and kept on file, with non-

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
possible.		as possible.				compliance reported.
<ul style="list-style-type: none"> <li>Implement an effective system of storm water run-off control, where required. The system must effectively collect and safely disseminate run-off water from all accumulation points and prevent down slope erosion.</li> </ul>	Project Developer	Undertake site inspections to verify the effectiveness and integrity of the storm water run-off control system and record any erosion on site or downstream. Corrective action must be implemented to the run-off control system if erosion occurs.	Quarterly	Environmental Manager	Quarterly	Inspections and audit reports compiled and kept on file, with non-compliance reported.
DECOMMISSIONING PHASE						
<ul style="list-style-type: none"> <li>No specific impacts are associated with the decommissioning phase other than those from the operational phase that will still be relevant for the duration of the decommissioning phase due to on-going occupation of the area.</li> </ul>						

## 7.6 SPECIFIC PROJECT RELATED ENVIRONMENTAL IMPACTS

<b>Impact Management Outcomes:</b>						
Visual: Reduce visual intrusion of construction activities project wide.						
Heritage: Achieve a layout that minimizes the potential later impacts to archaeological resources and/or graves. Minimise the chances of significant archaeological sites and/or graves being disturbed.						
Socio-Economic: Proactively manage the in-migration of potential employment seekers and in so doing mitigate impacts on existing social structures. Manage expectations. Make clear the difference between the number of temporary / construction workers and the number required for the operational phase. Draft an Economic Development Plan to align local investment with bona fide local needs.						
Ecology: To reduce the impact of the proposed PV project on ecology. Reduce impact on avifauna.						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<b>PLANNING AND DESIGN PHASE</b>						
<ul style="list-style-type: none"> <li>Ensure plans are in place to minimise fire hazards and dust generation.</li> </ul>	Project Developer	Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.	During design cycle and before construction commences.	Project Developer	During design cycle and before construction commences.	Review signed minutes of meetings or signed reports.
<ul style="list-style-type: none"> <li>Ensure that project layout avoids as many known archaeological resources and / or graves as possible.</li> </ul>	Project Developer	Take cognizance of the archaeological sites and graves reported in the HIA when designing the layout	During design cycle and before construction commences.	Project Developer	During design cycle and before construction commences.	Review signed minutes of meetings or signed reports.
<ul style="list-style-type: none"> <li>Develop and implement a Workforce Recruitment Plan</li> <li>Develop a database of Project Affected People (PAP) and their relevant skills and experience</li> <li>Develop and implement a Stakeholder Engagement Plan</li> </ul>	Project Developer	Mitigation measures require the drafting of a document which would in each instance serve as the method through which the mitigation actions are	Once-off during the design phase.	ECO	Once-off prior to commencement of construction	Approved policy, plan and database in place and ready for auditing, with approval kept on file.

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
		monitored.				
<ul style="list-style-type: none"> <li>▪ Reserve employment, where practical, for local residents</li> <li>▪ Clearly define and agree upon the PAP</li> </ul>	Project Developer	Mitigation measures require clear statements regarding for whom work would be reserved.	Once-off during the design phase.	ECO	Once-off prior to commencement of construction	Approved policy in place and ready for auditing, with approval kept on file.
<ul style="list-style-type: none"> <li>▪ The proponent should engage with local NGOs, CBOs and local government structures to identify and agree upon relevant skills and competencies required in the Kenhardt community.</li> <li>▪ Such skills and competencies should then be included in the Economic Development Plan.</li> <li>▪ Where possible, align Economic Development Plan with Local Municipality's IDP.</li> <li>▪ Delivery on the Economic Development Plan must be contractually binding on the proponent.</li> </ul>	Project Developer	Mitigation measures require the drafting of a document (i.e. the Economic Development Plan) which would in each instance serve as the method through which the mitigation actions are monitored.	Once-off during the design phase.	ECO	Once-off prior to commencement of construction	Approved policy in place and ready for auditing, with approval kept on file.
<ul style="list-style-type: none"> <li>▪ Search for and collect individuals of <i>Aloe dichotoma</i> and <i>Hoodia gordonii</i> that will be affected by the proposed activities and relocate to suitable habitat. This job has to be supervised by a suitably qualified horticulturist who understands dryland species.</li> <li>▪ These species may have to be temporarily planted in a nursery. Species must be planted out during the rainy season.</li> </ul>	ECO Project Developer	Relocation of species to a suitable habitat.  Regularly monitor the species for establishment.	Once before construction  Weekly for two months	ECO Project Developer	Once before construction  Weekly for two months	Review signed minutes of meetings or signed reports.

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	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> <li>▪ Apply a buffer of 32 m from major drainage lines and watercourses on site.</li> <li>▪ Apply a buffer of 20 m from minor drainage lines.</li> <li>▪ Apply a buffer of 100 m from water points, e.g. dams.</li> <li>▪ Apply a buffer of 100 m from NFEPA rivers and wetlands (National priority).</li> <li>▪ Dangerous goods may not be stored within 100 m of a watercourse.</li> <li>▪ The site camp must be located outside the watercourse area and buffers.</li> <li>▪ All project structures and infrastructure must be located outside the buffer zones.</li> <li>▪ No construction related activities, such as the site camp, storage of materials, temporary roads or ablution facilities may be located within watercourses and their buffer zones.</li> <li>▪ All key habitat features should have a buffer of at least 100 m (from the edge of the key habitat feature) and all major watercourses by at least 32 m to minimize any induced ecological edge-effects and associated disturbance of fauna during the construction and operation of the project (as specified in the Avifauna and Fauna studies in Chapters 9 and 10 respectively of the EIA Report).</li> </ul>	Project Developer and ECO.	<p>Monitor the implementation of the buffer zone</p> <p>The layout, including the buffer areas must be clearly marked on a map and clearly displayed</p>	Once-off during the design phase	ECO	Once-off prior to commencement	Signed off and approved designs that avoids sensitive areas.
<ul style="list-style-type: none"> <li>▪ Bird flight diverters should be installed on the overhead power lines</li> </ul>	Project Developer	Identify appropriate points within	Once off	Project Developer	Once off during the design phase	Final designs approved and kept on

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	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
where known flight paths of birds occur.		infrastructure for the installation of Bird Flight Diverters.  Verify that this is undertaken by reviewing the signed approved designs.				file

**CONSTRUCTION PHASE**

<ul style="list-style-type: none"> <li>Night time construction should be avoided where possible.</li> </ul>	ECO Contractor and	Construction operation times to be monitored and managed (as well as included in the tender contract).	Weekly	ECO	Monthly	Inspections and audit reports compiled and kept on file, with non-compliance reported.
<ul style="list-style-type: none"> <li>Night lighting of the construction sites should be minimised within requirements of safety and efficiency. A lighting plan should be developed and implemented to minimize light pollution, light trespass and glare during construction</li> </ul>	ECO Contractor and	Complaints about night lights should be investigated and documented in a register.	Weekly or bi-weekly	ECO	Monthly	Inspections and audit reports compiled and kept on file, with non-compliance reported.
<ul style="list-style-type: none"> <li>The Contractor and ECO must be informed of the possibility of archaeological resources and graves (i.e. ensure that all personnel are aware of the potential of encountering graves and what to do if this occurs (i.e. to report any suspicious stone features prior to disturbance)).</li> </ul>	Contractor / ECO ECO	Carry out Environmental Awareness Training to ensure that the Contractors are	Once-off training and ensure that all new staff are inducted.	ECO	Monthly	Inspections and audit reports compiled and kept on file, with non-compliance reported.

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	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> <li>Alternatively commission an archaeologist to examine the final development footprint at least six months prior to the commencement of construction.</li> </ul>		informed of the possible type of heritage features that may be encountered during the construction phase.  Conduct audits of the signed attendance registers.  Appoint a professional archaeologist to examine the construction footprint.  Conduct an audit to verify that the necessary permits are obtained by the archaeologist, if required.	Monthly  Once-off six months prior to construction.  As required / necessary during the construction phase.			
<ul style="list-style-type: none"> <li>Should any archaeological sites, artefacts, paleontological fossils or graves be exposed during construction, work in the immediate vicinity of the find must be stopped, SAHRA must be informed and the services of an accredited heritage professional obtained for an assessment of the heritage resources to be made.</li> </ul>	Project Developer and ECO	Ensure that an appropriate specialist is appointed and the verify that the necessary heritage find protocols are	As required during construction	ECO	As required during construction	Inspections and audit reports compiled and kept on file, with non-compliance reported, as well as proof of specialist

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
		implemented.				appointment.
<ul style="list-style-type: none"> <li>An integrated waste management approach must be implemented that is based on waste minimisation. Where waste is disposed of, such disposal shall only occur at a landfill licensed in terms of the National Environment Management Waste Act, 2008 (Act 59 of 2008).</li> <li>Any solid waste, which will not be recycled, must be disposed of at a landfill licensed in terms of section 20 (b) of the National Environment Management Waste Act, 2008 (Act No. 59 of 2008). No waste material may be left on site after construction.</li> </ul>	ECO and Contractor	Undertake site visits and inspections to ensure that an integrated waste management approach is implemented on site and that waste disposal is undertaken correctly.	Throughout the construction phase	ECO	Monthly	Proof of disposal (waste disposal slips or waybills) should be obtained and retained on file for auditing purposes.
<ul style="list-style-type: none"> <li>Implement the Workforce Recruitment Plan.</li> <li>Ensure employment is reserved, where practical, for local residents.</li> <li>Actively use the database of PAP and their relevant skills and experience to guide local employment.</li> </ul>	Construction Manager and ECO	Verify that local labour is, as far as practically possible, being used, by cross-referencing the Workforce Recruitment Plan with current recruitment practices, as well as cross-referencing employed personnel with PAP database	Three times during the estimated 18 month construction period.	ECO	Monthly	Inspections and audit reports compiled and kept on file, with non-compliance reported.
<ul style="list-style-type: none"> <li>Project Applicant to engage with the municipality and the police to see</li> </ul>	Construction Manager and ECO	Verify that Stakeholder Engagement Plan is	Three times during the estimated 18	ECO	Monthly	Inspections and audit reports compiled and



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<b>Impact Management Actions</b>	<b>Implementation</b>			<b>Monitoring</b>		
	<b>Responsible Person</b>	<b>Method of Implementation</b>	<b>Timeframe for Implementation</b>	<b>Responsible Person</b>	<b>Frequency</b>	<b>Evidence of Compliance</b>
where they can assist in limiting social deviance.		being implemented with written proof of such engagement with the PAP.	month construction period			kept on file, with non-compliance reported.
<ul style="list-style-type: none"> <li>Implement the Stakeholder Engagement Plan</li> </ul>	Construction Manager and ECO	Verify that Stakeholder Engagement Plan is being implemented with written proof of such engagement with the PAP.	Three times during the estimated 18 month construction period.	ECO	Monthly	Inspections and audit reports compiled and kept on file, with non-compliance reported.
<ul style="list-style-type: none"> <li>Procure goods and services, where practical, within the study area</li> <li>Obtain regularly required goods and services from as large a selection of local service providers as possible</li> </ul>	Construction Manager and ECO	Verify purchase of local goods and services through proof of purchase.	Three times during the estimated 18 month construction period.	ECO	Monthly	Inspections and audit reports compiled and kept on file, with non-compliance reported.
<ul style="list-style-type: none"> <li>Implement the Economic Development Plan</li> </ul>	Construction Manager and ECO	Verify that the Economic development Plan is being implemented.	Three times during the estimated 18 month construction period.	ECO	Monthly	Inspections and audit reports compiled and kept on file, with non-compliance reported.
<b>OPERATIONAL PHASE</b>						
<ul style="list-style-type: none"> <li>Workers are not allowed to collect plants for firewood or veldkos or set snares or otherwise trap and kill animals (mammals / birds / reptiles).</li> </ul>	Environmental Manager	Ensure that staff are given induction and	Once-off and upon new staff being	Environmental Manager	Monthly	Attendance registers of the environmental

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	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
		environmental awareness training to discuss these aspects. New staff must also be inducted. Ensure that environmental awareness programmes are implemented	appointed			awareness training kept on file
<ul style="list-style-type: none"> <li>▪ Painted features should be maintained and repainted when colour fades or paint flakes.</li> </ul>	Environmental Manager	Inspect painted features and ensure that they are maintained and re-painted where required. Ensure that there is good maintenance.	As required	Environmental Manager	As required	Proof of maintenance and re-painting kept on file.
<ul style="list-style-type: none"> <li>▪ Implement the Workforce Recruitment Plan.</li> <li>▪ Ensure employment is reserved, where practical, for local residents.</li> <li>▪ Actively use the database of PAP and their relevant skills and experience to guide local employment.</li> </ul>	Environmental Manager	Verify that local labour is, as far as practically possible, being used, by cross-referencing the Workforce Recruitment Plan with current recruitment practices, as well as cross-referencing	Once a year during the operational phase.	Environmental Manager	Monthly	Inspections and audit reports compiled and kept on file, with non-compliance reported.

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Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
		employed personnel with PAP database				
<ul style="list-style-type: none"> <li>▪ Implement the Stakeholder Engagement Plan</li> </ul>	Environmental Manager	Verify that Stakeholder Engagement Plan is being implemented with written proof of such engagement with the PAP.	Once a year during the operational phase.	Environmental Manager	Monthly	Inspections and audit reports compiled and kept on file, with non-compliance reported.
<ul style="list-style-type: none"> <li>▪ Procure goods and services, where practical, within the study area</li> <li>▪ Obtain regularly required goods and services from as large a selection of local service providers as possible</li> </ul>	Environmental Manager	Verify purchase of local goods and services through proof of purchase.	Three times during the estimated 18 month construction period.	Environmental Manager	Monthly	Inspections and audit reports compiled and kept on file, with non-compliance reported.
<ul style="list-style-type: none"> <li>▪ Implement the Economic Development Plan</li> </ul>	Environmental Manager	Verify that the Economic development Plan is being implemented.	Three times during the estimated 18 month construction period.	Environmental Manager	Monthly	Inspections and audit reports compiled and kept on file, with non-compliance reported.
DECOMMISSIONING PHASE						
<ul style="list-style-type: none"> <li>▪ Exotic weed control measures to be instituted through weed control programme. Regular redress of exotic weed through the use of herbicide and manual removal.</li> </ul>	Project Developer Project Developer	Compile weed eradication programme for a period of 12 months after the decommissioning	Weed eradication exercise to be undertaken every 6 months for a period of 12 months following	ECO	Monthly	Inspections and audit reports compiled and kept on file, with non-compliance reported.

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	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
		exercise.  Appoint contractor to undertake the weed eradication programme.	decommissioning.  Prior to the commencement of the decommissioning phase.			
<ul style="list-style-type: none"> <li>Comply with relevant South African labour legislation when retrenching employees</li> </ul>	Contractor and ECO	Verify that retrenchment practices are compliant with south African labour legislation	Once-off during decommissioning	ECO	Monthly	Inspections and audit reports compiled and kept on file, with non-compliance reported.
<ul style="list-style-type: none"> <li>Consider appropriate succession training of locally employed staff earmarked for retrenchment during decommissioning</li> </ul>	Contractor and ECO	Verify that the project applicant implemented succession training of locally employed staff before the plant is decommissioned	Once-off during decommissioning	ECO	Monthly	Inspections and audit reports compiled and kept on file, with non-compliance reported.
<ul style="list-style-type: none"> <li>All project infrastructures should be decommissioned appropriately and thoroughly to avoid misuse.</li> <li>Ensure that closure objectives are agreed upon with interested and</li> </ul>	Contractor and ECO	Verify that decommissioned infrastructure does not pose any significant	Once-off at the end of decommissioning	ECO	Once-off	Inspections and audit reports compiled and kept on file, with non-compliance reported.

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	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
affected parties.		risk to the environment or the people living in the environment.				
<ul style="list-style-type: none"> <li>▪ Working at night should be avoided.</li> </ul>	ECO Contractor and	Monitoring adherence requirement of to	On-going	ECO	Monthly	Inspections and audit reports compiled and kept on file, with non-compliance reported.
<ul style="list-style-type: none"> <li>▪ Night lighting of reclamation sites should be minimised within requirements of safety and efficiency.</li> </ul>	ECO Contractor and	Monitoring adherence requirement of to	On-going	ECO	Monthly	Inspections and audit reports compiled and kept on file, with non-compliance reported.

## 8 APPENDIX A – ROLES AND RESPONSIBILITIES

Responsible Person(s)	Role and Responsibilities
Developer's Project Manager (DPM)	<p><u>Role</u> The Project Developer is accountable for ensuring compliance with the EMPr and any conditions of approval from the competent authority (CA). Where required, an environmental control officer (ECO) must be contracted by the Project Developer to objectively monitor the implementation of the EMPr according to relevant environmental legislation, and the conditions of the environmental authorisation (EA). The Project Developer is further responsible for providing and giving mandate to enable the ECO to perform responsibilities, and he must ensure that the ECO is integrated as part of the project team while remaining independent.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> <li>- Be fully conversant with the conditions of the EA;</li> <li>- Ensure that all stipulations within the EMPr are communicated and adhered to by the Developer and its Contractor(s);</li> <li>- Issuing of site instructions to the Contractor for corrective actions required;</li> <li>- Monitor the implementation of the EMPr throughout the project by means of site inspections and meetings. Overall management of the project and EMPr implementation; and</li> <li>- Ensure that periodic environmental performance audits are undertaken on the project implementation.</li> </ul>
Developer Site Supervisor (DSS)	<p><u>Role</u> The DSS reports directly to the DPM, oversees site works, liaises with the contractor(s) and the ECO. The DSS is responsible for the day to day implementation of the EMPr and for ensuring the compliance of all contractors with the conditions and requirements stipulated in the EMPr.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> <li>- Ensure that all contractors identify a contractor's Environmental Officer (cEO);</li> <li>- Must be fully conversant with the conditions of the EA. Oversees site works, liaison with Contractor, DPM and ECO;</li> <li>- Must ensure that all landowners have the relevant contact details of the site staff, ECO and cEO;</li> <li>- Issuing of site instructions to the Contractor for corrective actions required;</li> <li>- Will issue all non-compliances to contractors; and</li> <li>- Ratify the Monthly Environmental Report.</li> </ul>
Environmental Control Officer (ECO)	<p><u>Role</u> The ECO should have appropriate training and experience in the implementation of environmental management specifications. The primary role of the ECO is to act as an independent quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts. In this respect, the ECO is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation and be available to advise on incidental issues that arise. The ECO is also required to conduct compliance audits, verifying the monitoring reports submitted by the cEO. The ECO provides feedback to the DSS and Project Manager regarding all environmental matters. The Contractor, cEO and dEO are answerable to the Environmental Control Officer for non-compliance with the Performance Specifications as set out in the EA and EMPr.</p>

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	<p>The ECO provides feedback to the DSS and Project Manager, who in turn reports back to the Contractor and potential and Registered Interested &amp; Affected Parties' (RI&amp;AP's), as required. Issues of non-compliance raised by the ECO must be taken up by the Project Manager, and resolved with the Contractor as per the conditions of his contract. Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a variation, not allowed for in the Performance Specification) must be endorsed by the Project Manager. The ECO must also, as specified by the EA, report to the relevant CA as and when required.</p> <p><u>Responsibilities</u> The responsibilities of the ECO will include the following:</p> <ul style="list-style-type: none"> <li>- Be aware of the findings and conclusions of all EA related to the development;</li> <li>- Be familiar with the recommendations and mitigation measures of this EMPr;</li> <li>- Be conversant with relevant environmental legislation, policies and procedures, and ensure compliance with them;</li> <li>- Undertake regular and comprehensive site inspections / audits of the construction site according to the generic EMPr and applicable licenses in order to monitor compliance as required;</li> <li>- Educate the construction team about the management measures contained in the EMPr and environmental licenses;</li> <li>- Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective;</li> <li>- Monitoring the performance of the Contractors and ensuring compliance with the EMPr and associated Method Statements;</li> <li>- In consultation with the Developer Site Supervisor order the removal of person(s) and/or equipment which are in contravention of the specifications of the EMPr and/or environmental licenses;</li> <li>- Liaison between the DPM, Contractors, authorities and other lead stakeholders on all environmental concerns;</li> <li>- Compile a regular environmental audit report highlighting any non-compliance issues as well as satisfactory or exceptional compliance with the EMPr;</li> <li>- Validating the regular site inspection reports, which are to be prepared by the contractor Environmental Officer (cEO);</li> <li>- Checking the cEO's record of environmental incidents (spills, impacts, legal transgressions etc.) as well as corrective and preventive actions taken;</li> <li>- Checking the cEO's public complaints register in which all complaints are recorded, as well as action taken;</li> <li>- Assisting in the resolution of conflicts;</li> <li>- Facilitate training for all personnel on the site – this may range from carrying out the training, to reviewing the training programmes of the Contractor;</li> <li>- In case of non-compliances, the ECO must first communicate this to the Senior Site Supervisor, who has the power to ensure this matter is addressed. Should no action or insufficient action be taken, the ECO may report this matter to the authorities as non-compliance;</li> <li>- Maintenance, update and review of the EMPr;</li> <li>- Communication of all modifications to the EMPr to the relevant stakeholders.</li> </ul>
developer Environmental Officer (dEO)	<p><u>Role</u> The dEOs will report to the Project Manager and are responsible for implementation of the EMPr, environmental monitoring and reporting, providing environmental input to the Project Manager and Contractor's Manager, liaising with contractors and the landowners as well as a range of environmental coordination responsibilities.</p>

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Responsible Person(s)	Role and Responsibilities
	<p><u>Responsibilities</u></p> <ul style="list-style-type: none"> <li>- Be fully conversant with the EMPr;</li> <li>- Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures;</li> <li>- Ensure that all stipulations within the EMPr are communicated and adhered to by the Employees, Contractor(s) ;</li> <li>- Confine the development site to the demarcated area;</li> <li>- Conduct environmental internal audits with regards to EMPr and authorisation compliance (on cEO);</li> <li>- Assist the contractors in addressing environmental challenges on site;</li> <li>- Assist in incident management:</li> <li>- Reporting environmental incidents to developer and ensuring that corrective action is taken, and lessons learnt shared;</li> <li>- Assist the contractor in investigating environmental incidents and compile investigation reports;</li> <li>- Follow-up on pre-warnings, defects, non-conformance reports;</li> <li>- Measure and communicate environmental performance to the Contractor;</li> <li>- Conduct environmental awareness training on site together with ECO and cEO;</li> <li>- Ensure that the necessary legal permits and / or licenses are in place and up to date;</li> <li>- Acting as Developer's Environmental Representative on site and work together with the ECO and contractor;</li> </ul>
Contractor	<p><u>Role</u></p> <p>The Contractor appoints the cEO and has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the EMPr and that Method Statements are implemented as described. External contractors must ensure compliance with this EMPr while performing the onsite activities as per their contract with the Project Developer. The contractors are required, where specified, to provide Method Statements setting out in detail how the impact management actions contained in the EMPr will be implemented during the development or expansion of substation infrastructure for the transmission and distribution of electricity activities.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> <li>- project delivery and quality control for the development services as per appointment;</li> <li>- employ a suitably qualified person to monitor and report to the Project Developer's appointed person on the daily activities on-site during the construction period;</li> <li>- ensure that safe, environmentally acceptable working methods and practices are implemented and that equipment is properly operated and maintained, to facilitate proper access and enable any operation to be carried out safely;</li> <li>- attend on site meeting(s) prior to the commencement of activities to confirm the procedure and designated activity zones;</li> <li>- ensure that contractors' staff repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in EMPr, to the satisfaction of the ECO.</li> </ul>
contractor Environmental Officer (cEO)	<p><u>Role</u></p> <p>Each Contractor affected by the EMPr should appoint a cEO, who is responsible for the on-site implementation of the EMPr (or relevant sections of the EMPr). The Contractor's representative can be the site agent; site engineer; a dedicated environmental officer; or an independent consultant. The Contractor must ensure that the Contractor's Representative is suitably qualified to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the Environmental Control Officer and the public. As a minimum the cEO shall meet the following criteria:</p>



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Responsible Person(s)	Role and Responsibilities
	<p><u>Responsibilities</u></p> <ul style="list-style-type: none"> <li>- Be on site throughout the duration of the project and be dedicated to the project;</li> <li>- Ensure all their staff are aware of the environmental requirements, conditions and constraints with respect to all of their activities on site;</li> <li>- Implementing the environmental conditions, guidelines and requirements as stipulated within the EA, EMPr and Method Statements;</li> <li>- Attend the Environmental Site Meeting;</li> <li>- Undertaking corrective actions where non-compliances are registered within the stipulated timeframes;</li> <li>- Report back formally on the completion of corrective actions;</li> <li>- Assist the ECO in maintaining all the site documentation;</li> <li>- Prepare the site inspection reports and corrective action reports for submission to the ECO;</li> <li>- Assist the ECO with the preparing of the monthly report; and</li> <li>- Where more than one Contractor is undertaking work on site, each company appointed as a Contractor will appoint a cEO representing that company.</li> </ul>

## 9 APPENDIX B – PRE-APPROVED GAZETTED EMPr FOR POWER LINE DEVELOPMENT (GN 435)

**PRE-APPROVED GENERIC EMPr TEMPLATE FOR OVERHEAD ELECTRICITY TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE GOVERNMENT GAZETTE 42323, GOVERNMENT NOTICE 435**

**SECTION 5: IMPACT MANAGEMENT OUTCOMES AND IMPACT MANAGEMENT ACTIONS**

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

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

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

*5.1 Environmental awareness training*

Impact management outcome: All onsite staff are aware and understands the individual responsibilities in terms of this EMPr.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All staff must receive environmental awareness training prior to commencement of the activities;</li> <li>- The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course;</li> <li>- Refresher environmental awareness training is available as and when required;</li> <li>- All staff are aware of the conditions and controls linked to the EA and within the EMPr and made aware of their individual roles and responsibilities in achieving compliance with the EA and EMPr;</li> <li>- The Contractor must erect and maintain information posters at key locations on site,</li> </ul>						

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Impact management outcome: All onsite staff are aware and understands the individual responsibilities in terms of this EMPr.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<p>and the posters must include the following information as a minimum:</p> <ul style="list-style-type: none"> <li>a) Safety notifications; and</li> <li>b) No littering.</li> </ul> <p>– Environmental awareness training must include as a minimum the following:</p> <ul style="list-style-type: none"> <li>a) Description of significant environmental impacts, actual or potential, related to their work activities;</li> <li>b) Mitigation measures to be implemented when carrying out specific activities;</li> <li>c) Emergency preparedness and response procedures;</li> <li>d) Emergency procedures;</li> <li>e) Procedures to be followed when working near or within sensitive areas;</li> <li>f) Wastewater management procedures;</li> <li>g) Water usage and conservation;</li> <li>h) Solid waste management procedures;</li> <li>i) Sanitation procedures;</li> <li>j) Fire prevention; and</li> <li>k) Disease prevention.</li> </ul> <p>– A record of all environmental awareness training courses undertaken as part of the EMPr must be available;</p> <p>– Educate workers on the dangers of open and/or unattended fires;</p> <p>– A staff attendance register of all staff to have received environmental awareness training must be available.</p> <p>– Course material must be available and presented in appropriate languages that all staff can understand.</p>						

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*5.2. Site Establishment development*

Impact management outcome: Impacts on the environment are minimised during site establishment and the development footprint are kept to demarcated development area.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- A method statement must be provided by the contractor prior to any onsite activity that includes the layout of the construction camp in the form of a plan showing the location of key infrastructure and services (where applicable), including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous materials storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management;</li> <li>- Location of camps must be within approved area to ensure that the site does not impact on sensitive areas identified in the environmental assessment or site walk through;</li> <li>- Sites must be located where possible on previously disturbed areas;</li> <li>- The camp must be fenced in accordance with <i>Section 5.5: Fencing and gate installation</i>; and</li> <li>- The use of existing accommodation for contractor staff, where possible, is encouraged.</li> </ul>						

*5.3. Access restricted areas*

Impact management outcome: Access to restricted areas prevented.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Identification of access restricted areas is to be informed by the environmental assessment, site walk through and any additional areas identified during development;</li> <li>- Erect, demarcate and maintain a temporary barrier with clear signage around the perimeter of any access restricted area, colour coding could be used if appropriate; and</li> <li>- Unauthorised access and development related activity inside access restricted areas is prohibited.</li> </ul>						

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5.4. Access roads

Impact management outcome: Minimise impact to the environment through the planned and restricted movement of vehicles on site.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Access to the servitude and tower positions must be negotiated with the relevant landowner and must fall within the assessed and authorised area;</li> <li>- An access agreement must be formalised and signed by the DPM, Contractor and landowner before commencing with the activities;</li> <li>- The access roads to tower positions must be signposted after access has been negotiated and before the commencement of the activities;</li> <li>- All private roads used for access to the servitude must be maintained and upon completion of the works, be left in at least the original condition</li> <li>- All contractors must be made aware of all these access routes.</li> <li>- Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the contractor's expense;</li> <li>- Maximum use of both existing servitudes and existing roads must be made to minimize further disturbance through the development of new roads;</li> <li>- In circumstances where private roads must be used, the condition of the said roads must be recorded in accordance with <i>section 4.9: photographic record</i>; prior to use and the condition thereof agreed by the landowner, the DPM, and the contractor;</li> <li>- Access roads in flattish areas must follow fence lines and tree belts to avoid fragmentation of vegetated areas or croplands</li> <li>- Access roads must only be developed on pre-planned and approved roads.</li> </ul>						

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5.5. Fencing and Gate installation

Impact management outcome: Minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Use existing gates provided to gain access to all parts of the area authorised for development, where possible;</li> <li>- Existing and new gates to be recorded and documented in accordance with section 4.9: <i>photographic record</i>;</li> <li>- All gates must be fitted with locks and be kept locked at all times during the development phase, unless otherwise agreed with the landowner;</li> <li>- At points where the line crosses a fence in which there is no suitable gate within the extent of the line servitude, on the instruction of the DPM, a gate must be installed at the approval of the landowner;</li> <li>- Care must be taken that the gates must be so erected that there is a gap of no more than 100 mm between the bottom of the gate and the ground;</li> <li>- Where gates are installed in jackal proof fencing, a suitable reinforced concrete sill must be provided beneath the gate;</li> <li>- Original tension must be maintained in the fence wires;</li> <li>- All gates installed in electrified fencing must be re-electrified;</li> <li>- All demarcation fencing and barriers must be maintained in good working order for the duration of overhead transmission and distribution electricity infrastructure development activities;</li> <li>- Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas, where appropriate and would not cause harm to the sensitive flora;</li> <li>- Any temporary fencing to restrict the movement of live-stock must only be erected with the permission of the landowner.</li> <li>- All fencing must be developed of high quality material bearing the SABS mark;</li> <li>- The use of razor wire as fencing must be avoided;</li> <li>- Fenced areas with gate access must remain locked after hours, during weekends and on holidays if staff is away from site. Site security will be required at all times;</li> <li>- On completion of the development phase all temporary fences are to be removed;</li> <li>- The contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground level but rather removed completely.</li> </ul>						

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5.6. Water Supply Management

Impact management outcome: Undertake responsible water usage.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All abstraction points or bore holes must be registered with the DHSWS and suitable water meters installed to ensure that the abstracted volumes are measured on a daily basis;</li> <li>- The Contractor must ensure the following:                             <ul style="list-style-type: none"> <li>a. The vehicle abstracting water from a river does not enter or cross it and does not operate from within the river;</li> <li>b. No damage occurs to the river bed or banks and that the abstraction of water does not entail stream diversion activities; and</li> <li>c. All reasonable measures to limit pollution or sedimentation of the downstream watercourse are implemented.</li> </ul> </li> <li>- Ensure water conservation is being practiced by:                             <ul style="list-style-type: none"> <li>a. Minimising water use during cleaning of equipment;</li> <li>b. Undertaking regular audits of water systems; and</li> <li>c. Including a discussion on water usage and conservation during environmental awareness training.</li> <li>d. The use of grey water is encouraged.</li> </ul> </li> </ul>						

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*5.7. Storm- and wastewater management*

Impact management outcome: Impacts to the environment caused by stormwater and wastewater discharges during construction are avoided.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Runoff from the cement/ concrete batching areas must be strictly controlled, and contaminated water must be collected, stored and either treated or disposed of off-site, at a location approved by the project manager;</li> <li>- All spillage of oil onto concrete surfaces must be controlled by the use of an approved absorbent material and the used absorbent material disposed of at an appropriate waste disposal facility;</li> <li>- Natural stormwater runoff not contaminated during the development and clean water can be discharged directly to watercourses and water bodies, subject to the Project Manager's approval and support by the ECO;</li> <li>- Water that has been contaminated with suspended solids, such as soils and silt, may be released into watercourses or water bodies only once all suspended solids have been removed from the water by settling out these solids in settlement ponds. The release of settled water back into the environment must be subject to the Project Manager's approval and support by the ECO.</li> </ul>						

*5.8. Solid and hazardous waste management*

Impact management outcome: Waste is appropriately stored, handled and safely disposed of at a recognised waste facility.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All measures regarding waste management must be undertaken using an integrated waste management approach;</li> <li>- Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided;</li> <li>- A suitably positioned and clearly demarcated waste collection site must be identified and provided;</li> <li>- The waste collection site must be maintained in a clean and orderly manner;</li> <li>- Waste must be segregated into separate bins and clearly marked for each waste type</li> </ul>						



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Impact management outcome: Waste is appropriately stored, handled and safely disposed of at a recognised waste facility.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
for recycling and safe disposal; – Staff must be trained in waste segregation; – Bins must be emptied regularly; – General waste produced onsite must be disposed of at registered waste disposal sites/ recycling company; – Hazardous waste must be disposed of at a registered waste disposal site; – Certificates of safe disposal for general, hazardous and recycled waste must be maintained.						

**5.9. Protection of watercourses and estuaries**

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

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Impact management outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- When working in or near any watercourse or estuary, the following environmental controls and consideration must be taken:                             <ul style="list-style-type: none"> <li>a) Water levels during the period of construction;</li> <li>b) No altering of the bed, banks, course or characteristics of a watercourse</li> <li>c) During the execution of the works, appropriate measures to prevent pollution and contamination of the riparian environment must be implemented e.g. including ensuring that construction equipment is well maintained;</li> <li>d) Where earthwork is being undertaken in close proximity to any watercourse, slopes must be stabilised using suitable materials, i.e. sandbags or geotextile fabric, to prevent sand and rock from entering the channel; and</li> <li>e) Appropriate rehabilitation and re-vegetation measures for the watercourse banks must be implemented timeously. In this regard, the banks should be appropriately and incrementally stabilised as soon as development allows.</li> </ul> </li> </ul>						

**5.10. Vegetation clearing**

Impact management outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<p>General:</p> <ul style="list-style-type: none"> <li>- Indigenous vegetation which does not interfere with the development must be left undisturbed;</li> <li>- Protected or endangered species may occur on or near the development site. Special care should be taken not to damage such species;</li> <li>- Search, rescue and replanting of all protected and endangered species likely to be damaged during project development must be identified by the relevant specialist and completed prior to any development or clearing;</li> <li>- Permits for removal must be obtained from the Department of Agriculture, Forestry and Fisheries prior to the cutting or clearing of the affected species, and they must be</li> </ul>						

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Impact management outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<p>filed;</p> <ul style="list-style-type: none"> <li>- The Environmental Audit Report must confirm that all identified species have been rescued and replanted and that the location of replanting is compliant with conditions of approvals;</li> <li>- Trees felled due to construction must be documented and form part of the Environmental Audit Report;</li> <li>- Rivers and watercourses must be kept clear of felled trees, vegetation cuttings and debris;</li> <li>- Only a registered pest control operator may apply herbicides on a commercial basis and commercial application must be carried out under the supervision of a registered pest control operator, supervision of a registered pest control operator or is appropriately trained;</li> <li>- A daily register must be kept of all relevant details of herbicide usage;</li> <li>- No herbicides must be used in estuaries;</li> <li>- All protected species and sensitive vegetation not removed must be clearly marked and such areas fenced off in accordance to <i>Section 5.3: Access restricted areas</i>.</li> </ul> <p>Servitude:</p> <ul style="list-style-type: none"> <li>- Vegetation that does not grow high enough to cause interference with overhead transmission and distribution infrastructures, or cause a fire hazard to any plantation, must not be cut or trimmed unless it is growing in the road access area, and then only at the discretion of the Project Manager;</li> <li>- Where clearing for access purposes is essential, the maximum width to be cleared within the servitude must be in accordance to distance as agreed between the land owner and the EA holder</li> <li>- Alien invasive vegetation must be removed according to a plan (in line with relevant municipal and provincial procedures, guidelines and recommendations) and disposed of at a recognised waste disposal facility;</li> <li>- Vegetation must be trimmed where it is likely to intrude on the minimum vegetation clearance distance (MVCD) or will intrude on this distance before the next scheduled clearance. MVCD is determined from SANS 10280;</li> <li>- Debris resulting from clearing and pruning must be disposed of at a recognised waste disposal facility, unless the landowners wish to retain the cut vegetation;</li> <li>- In the case of the development of new overhead transmission and distribution</li> </ul>						

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Impact management outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
infrastructures, a one metre "trace-line" must be cut through the vegetation for stringing purposes only and no vehicle access must be cleared along the "trace-line". Alternative methods of stringing which limit impact to the environment must always be considered.						

**5.11. Protection of fauna**

Impact management outcome: Minimise disturbance to fauna.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- No interference with livestock must occur without the landowner's written consent and with the landowner or a person representing the landowner being present;</li> <li>- The breeding sites of raptors and other wild birds species must be taken into consideration during the planning of the development programme;</li> <li>- Breeding sites must be kept intact and disturbance to breeding birds must be avoided. Special care must be taken where nestlings or fledglings are present;</li> <li>- Nesting sites on existing parallel lines must be documented;</li> <li>- Special recommendations of the avian specialist must be adhered to at all times to prevent unnecessary disturbance of birds;</li> <li>- Bird guards and diverters must be installed on the new line as per the recommendations of the specialist;</li> <li>- No poaching must be tolerated under any circumstances. All animal dens in close proximity to the works areas must be marked as Access restricted areas;</li> <li>- No deliberate or intentional killing of fauna is allowed;</li> <li>- In areas where snakes are abundant, snake deterrents to be deployed on the pylons to prevent snakes climbing up, being electrocuted and causing power outages; and</li> <li>- No Threatened or Protected species (ToPs) and/or protected fauna as listed according NEMBA (Act No. 10 of 2004) and relevant provincial ordinances may be removed and/or relocated without appropriate authorisations/permits.</li> </ul>						

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**5.12. Protection of heritage resources**

Impact management outcome: Minimise impact to heritage resources.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Identify, demarcate and prevent impact to all known sensitive heritage features on site in accordance with the No-Go procedure in <i>Section 5.3: Access restricted areas</i>;</li> <li>- Carry out general monitoring of excavations for potential fossils, artefacts and material of heritage importance;</li> <li>- All work must cease immediately, if any human remains and/or other archaeological, palaeontological and historical material are uncovered. Such material, if exposed, must be reported to the nearest museum, archaeologist/ palaeontologist (or the South African Police Services), so that a systematic and professional investigation can be undertaken. Sufficient time must be allowed to remove/collect such material before development recommences.</li> </ul>						

**5.13. Safety of the public**

Impact management outcome: All precautions are taken to minimise the risk of injury, harm or complaints.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Identify fire hazards, demarcate and restrict public access to these areas as well as notify the local authority of any potential threats e.g. large brush stockpiles, fuels etc.;</li> <li>- All unattended open excavations must be adequately fenced or demarcated;</li> <li>- Adequate protective measures must be implemented to prevent unauthorised access to and climbing of partly constructed towers and protective scaffolding;</li> <li>- Ensure structures vulnerable to high winds are secured;</li> <li>- Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged.</li> </ul>						

**5.14. Sanitation**

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Impact management outcome: Clean and well maintained toilet facilities are available to all staff in an effort to minimise the risk of disease and impact to the environment.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Mobile chemical toilets are installed onsite if no other ablution facilities are available;</li> <li>- The use of ablution facilities and or mobile toilets must be used at all times and no indiscriminate use of the veld for the purposes of ablutions must be permitted under any circumstances;</li> <li>- Where mobile chemical toilets are required, the following must be ensured:                             <ul style="list-style-type: none"> <li>a) Toilets are located no closer than 100 m to any watercourse or water body;</li> <li>b) Toilets are secured to the ground to prevent them from toppling due to wind or any other cause;</li> <li>c) No spillage occurs when the toilets are cleaned or emptied and the contents are managed in accordance with the EMPr;</li> <li>d) Toilets have an external closing mechanism and are closed and secured from the outside when not in use to prevent toilet paper from being blown out;</li> <li>e) Toilets are emptied before long weekends and workers holidays, and must be locked after working hours;</li> <li>f) Toilets are serviced regularly and the ECO must inspect toilets to ensure compliance to health standards;</li> </ul> </li> <li>- A copy of the waste disposal certificates must be maintained.</li> </ul>						

*5.15. Prevention of disease*

Impact Management outcome: All necessary precautions linked to the spread of disease are taken.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Undertake environmentally-friendly pest control in the camp area;</li> <li>- Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV AIDS;</li> <li>- The Contractor must ensure that information posters on AIDS are displayed in the Contractor Camp area;</li> <li>- Information and education relating to sexually transmitted diseases to be made available to both construction workers and local community, where applicable;</li> </ul>						

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Impact Management outcome: All necessary precautions linked to the spread of disease are taken.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Free condoms must be made available to all staff on site at central points;</li> <li>- Medical support must be made available;</li> <li>- Provide access to Voluntary HIV Testing and Counselling Services.</li> </ul>						

**5.16. Emergency procedures**

Impact management outcome: Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Compile an Emergency Response Action Plan (ERAP) prior to the commencement of the proposed project;</li> <li>- The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation;</li> <li>- All staff must be made aware of emergency procedures as part of environmental awareness training;</li> <li>- The relevant local authority must be made aware of a fire as soon as it starts;</li> <li>- In the event of emergency necessary mitigation measures to contain the spill or leak must be implemented (see <i>Hazardous Substances section 5.17</i>).</li> </ul>						

**5.17. Hazardous substances**

Impact management outcome: Safe storage, handling, use and disposal of hazardous substances.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- The use and storage of hazardous substances to be minimised and non-hazardous and non-toxic alternatives substituted where possible;</li> </ul>						

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Impact management outcome: Safe storage, handling, use and disposal of hazardous substances.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All hazardous substances must be stored in suitable containers as defined in the Method Statement;</li> <li>- Containers must be clearly marked to indicate contents, quantities and safety requirements;</li> <li>- All storage areas must be bunded. The bunded area must be of sufficient capacity to contain a spill / leak from the stored containers;</li> <li>- Bunded areas to be suitably lined with a SABS approved liner;</li> <li>- An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date on a continuous basis;</li> <li>- All hazardous chemicals that will be used on site must have Material Safety Data Sheets (MSDS);</li> <li>- All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet;</li> <li>- Employees handling hazardous substances / materials must be aware of the potential impacts and follow appropriate safety measures. Appropriate personal protective equipment must be made available;</li> <li>- The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowsers;</li> <li>- The tanks/ bowsers must be situated on a smooth impermeable surface (concrete) with a permanent bund. The impermeable lining must extend to the crest of the bund and the volume inside the bund must be 130% of the total capacity of all the storage tanks/ bowsers (110% statutory requirement plus an allowance for rainfall);</li> <li>- The floor of the bund must be sloped, draining to an oil separator;</li> <li>- Provision must be made for refueling at the storage area by protecting the soil with an impermeable groundcover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained;</li> <li>- All empty externally dirty drums must be stored on a drip tray or within a bunded area;</li> <li>- No unauthorised access into the hazardous substances storage areas must be permitted;</li> <li>- No smoking must be allowed within the vicinity of the hazardous storage areas;</li> <li>- Adequate fire-fighting equipment must be made available at all hazardous storage</li> </ul>						



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Impact management outcome: Safe storage, handling, use and disposal of hazardous substances.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
areas; – Where refueling away from the dedicated refueling station is required, a mobile refueling unit must be used. Appropriate ground protection such as drip trays must be used; – An appropriately sized spill kit kept onsite relevant to the scale of the activity/s involving the use of hazardous substance must be available at all times; – The responsible operator must have the required training to make use of the spill kit in emergency situations; – An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken; – In the event of a spill, contaminated soil must be collected in containers and stored in a central location and disposed of according to the National Environmental Management: Waste Act 59 of 2008. Refer to <i>Section 5.7</i> for procedures concerning <i>storm- and wastewater management</i> and <i>5.8</i> for <i>solid and hazardous waste management</i> .						

*5.18. Workshop, equipment maintenance and storage*

Impact management outcome: Soil, surface water and groundwater contamination is minimised.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Where possible and practical all maintenance of vehicles and equipment must take place in the workshop area; – During servicing of vehicles or equipment, especially where emergency repairs are effected outside the workshop area, a suitable drip tray must be used to prevent spills onto the soil. The relevant local authority must be made aware of a fire as soon as it starts; – Leaking equipment must be repaired immediately or be removed from site to facilitate repair;						

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Impact management outcome: Soil, surface water and groundwater contamination is minimised.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Workshop areas must be monitored for oil and fuel spills;</li> <li>- Appropriately sized spill kit kept onsite relevant to the scale of the activity taking place must be available;</li> <li>- The workshop area must have a bunded concrete slab that is sloped to facilitate runoff into a collection sump or suitable oil / water separator where maintenance work on vehicles and equipment can be performed;</li> <li>- Water drainage from the workshop must be contained and managed in accordance <i>Section 5.7: storm- and wastewater management.</i></li> </ul>						

**5.19. Batching plants**

Impact management outcome: Minimise spillages and contamination of soil, surface water and groundwater.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Concrete mixing must be carried out on an impermeable surface;</li> <li>- Batching plants areas must be fitted with a containment facility for the collection of cement laden water.</li> <li>- Dirty water from the batching plant must be contained to prevent soil and groundwater contamination</li> <li>- Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains;</li> <li>- A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted;</li> <li>- Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility;</li> <li>- Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site;</li> <li>- Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to <i>Section 5.20: Dust emissions</i>)</li> <li>- Any excess sand, stone and cement must be removed or reused from site on</li> </ul>						

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Impact management outcome: Minimise spillages and contamination of soil, surface water and groundwater.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
completion of construction period and disposed at a registered disposal facility; – Temporary fencing must be erected around batching plants in accordance with <i>Section 5.5: Fencing and gate installation.</i>						

**5.20. Dust emissions**

Impact management outcome: Dust prevention measures are applied to minimise the generation of dust.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO;</li> <li>– Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be re- vegetated or stabilised as soon as is practically possible;</li> <li>– Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present;</li> <li>– During high wind conditions, the ECO must evaluate the situation and make recommendations as to whether dust-damping measures are adequate, or whether working will cease altogether until the wind speed drops to an acceptable level;</li> <li>– Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind;</li> <li>– Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO;</li> <li>– Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas;</li> <li>– Straw stabilisation must be applied at a rate of one bale/10 m<sup>2</sup> and harrowed into the top 100 mm of top material, for all completed earthworks;</li> <li>– For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust.</li> </ul>						

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**5.21. Blasting**

Impact management outcome: Impact to the environment is minimised through a safe blasting practice.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Any blasting activity must be conducted by a suitably licensed blasting contractor; and</li> <li>- Notification of surrounding landowners, emergency services site personnel of blasting activity 24 hours prior to such activity taking place on Site.</li> </ul>						

**5.22. Noise**

Impact Management outcome: Unnecessary noise is prevented by ensuring that noise from construction activities is mitigated.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- The Contractor must keep noise level within acceptable limits, Restrict the use of sound amplification equipment for communication and emergency only;</li> <li>- All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained;</li> <li>- Any complaints received by the Contractor regarding noise must be recorded and communicated. Where possible or applicable, provide transport to and from the site on a daily basis for construction workers;</li> <li>- Develop a Code of Conduct for the construction phase in terms of behaviour of construction staff. Operating hours as determined by the environmental authorisation are adhered to during the development phase. Where not defined, it must be ensured that development activities must still meet the impact management outcome related to noise management.</li> </ul>						

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**5.23. Fire prevention**

Impact management outcome: Prevention of uncontrollable fires.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Designate smoking areas where the fire hazard could be regarded as insignificant;</li> <li>- Firefighting equipment must be available on all vehicles located on site;</li> <li>- The local Fire Protection Agency (FPA) must be informed of construction activities;</li> <li>- Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site;</li> <li>- Two way swop of contact details between ECO and FPA.</li> </ul>						

**5.24. Stockpiling and stockpile areas**

Impact management outcome: Erosion and sedimentation as a result of stockpiling are reduced.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All material that is excavated during the project development phase (either during piling (if required) or earthworks) must be stored appropriately on site in order to minimise impacts to watercourses, watercourses and water bodies;</li> <li>- All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods;</li> <li>- Topsoil stockpiles must not exceed 2 m in height;</li> <li>- During periods of strong winds and heavy rain, the stockpiles must be covered with appropriate material (e.g. cloth, tarpaulin etc.);</li> <li>- Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material in order to prevent erosion of the material.</li> </ul>						

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**5.25. Finalising tower positions**

Impact management outcome: No environmental degradation occurs as a result of the survey and pegging operations.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- No vegetation clearing must occur during survey and pegging operations;</li> <li>- No new access roads must be developed to facilitate access for survey and pegging purposes;</li> <li>- Project manager, botanical specialist and contractor to agree on final tower positions based on survey within assessed and approved areas;</li> <li>- The surveyor is to demarcate (peg) access roads/tracks in consultation with ECO. No deviations will be allowed without the prior written consent from the ECO.</li> </ul>						

**5.26. Excavation and Installation of foundations**

Impact management outcome: No environmental degradation occurs as a result of excavation or installation of foundations.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All excess spoil generated during foundation excavation must be disposed of in an appropriate manner and at a recognised disposal site, if not used for backfilling purposes;</li> <li>- Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes;</li> <li>- Management of equipment for excavation purposes must be undertaken in accordance with <i>Section 5.18: Workshop equipment maintenance and storage</i>; and</li> <li>- Hazardous substances spills from equipment must be managed in accordance with <i>Section 5.17: Hazardous substances</i>.</li> <li>- Batching of cement to be undertaken in accordance with <i>Section 5.19 : Batching plants</i>;</li> <li>- Residual cement must be disposed of in accordance with <i>Section 5.8: Solid and hazardous waste management</i>.</li> </ul>						

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5.27. Assembly and erecting towers

Impact management outcome: No environmental degradation occurs as a result of assembly and erecting of towers.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Prior to erection, assembled towers and tower sections must be stored on elevated surface (suggest wooden blocks) to minimise damage to the underlying vegetation;</li> <li>- In sensitive areas, tower assembly must take place off-site or away from sensitive positions;</li> <li>- The crane used for tower assembly must be operated in a manner which minimises impact to the environment;</li> <li>- The number of crane trips to each site must be minimised;</li> <li>- Wheeled cranes must be utilised in preference to tracked cranes;</li> <li>- Consideration must be given to erecting towers by helicopter or by hand where it is warranted to limit the extent of environmental impact;</li> <li>- Access to tower positions to be undertaken in accordance with access requirements in specified in Section 8.4: Access Roads;</li> <li>- Vegetation clearance to be undertaken in accordance with general vegetation clearance requirements specified in Section 8.10: Vegetation clearing;</li> <li>- No levelling at tower sites must be permitted unless approved by the Development Project Manager or Developer Site Supervisor;</li> <li>- Topsoil must be removed separately from subsoil material and stored for later use during rehabilitation of such tower sites;</li> <li>- Topsoil must be stored in heaps not higher than 1 m to prevent destruction of the seed bank within the topsoil;</li> <li>- Excavated slopes must be no greater than 1:3, but where this is unavoidable, appropriate measures must be undertaken to stabilise the slopes;</li> <li>- Fly rock from blasting activity must be minimised and any pieces greater than 150 mm falling beyond the Working Area, must be collected and removed;</li> <li>- Only existing disturbed areas are utilised as spoil areas;</li> <li>- Drainage is provided to control groundwater exit gradient with the spill areas such that migration of fines is kept to a minimum;</li> <li>- Surface water runoff is appropriately channeled through or around spoil areas;</li> <li>- During backfilling operations, care must be taken not to dump the topsoil at the bottom of the foundation and then put spoil on top of that;</li> <li>- The surface of the spoil is appropriately rehabilitated in accordance with the</li> </ul>						

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Impact management outcome: No environmental degradation occurs as a result of assembly and erecting of towers.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>requirements specified in Section 5.29: Landscaping and rehabilitation;</li> <li>– The retained topsoil must be spread evenly over areas to be rehabilitated and suitably compacted to effect re-vegetation of such areas to prevent erosion as soon as construction activities on the site is complete. Spreading of topsoil must not be undertaken at the beginning of the dry season.</li> </ul>						

**5.28. Stringing**

Impact management outcome: No environmental degradation occurs as a result of stringing.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Where possible, previously disturbed areas must be used for the siting of winch and tensioner stations. In all other instances, the siting of the winch and tensioner must avoid Access restricted areas and other sensitive areas;</li> <li>– The winch and tensioner station must be equipped with drip trays in order to contain any fuel, hydraulic fuel or oil spills and leaks;</li> <li>– Refueling of the winch and tensioner stations must be undertaken in accordance with Section 5.17: Hazardous substances;</li> <li>– In the case of the development of overhead transmission and distribution infrastructure, a one metre "trace-line" may be cut through the vegetation for stringing purposes only and no vehicle access must be cleared along "trace-lines". Vegetation clearing must be undertaken by hand, using chainsaws and hand held implements, with vegetation being cut off at ground level. No tracked or wheeled mechanised equipment must be used;</li> <li>– Alternative methods of stringing which limit impact to the environment must always be considered e.g. by hand or by using a helicopter;</li> <li>– Where the stringing operation crosses a public or private road or railway line, the necessary scaffolding/ protection measures must be installed to facilitate access. If, for any reason, such access has to be closed for any period(s) during development, the persons affected must be given reasonable notice, in writing;</li> </ul>						



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Impact management outcome: No environmental degradation occurs as a result of stringing.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- No services (electrical distribution lines, telephone lines, roads, railways lines, pipelines fences etc.) must be damaged because of stringing operations. Where disruption to services is unavoidable, persons affected must be given reasonable notice, in writing;</li> <li>- Where stringing operations cross cultivated land, damage to crops is restricted to the minimum required to conduct stringing operations, and reasonable notice (10 work days minimum), in writing, must be provided to the landowner;</li> <li>- Necessary scaffolding protection measures must be installed to prevent damage to the structures supporting certain high value agricultural areas such as vineyards, orchards, nurseries.</li> </ul>						

*5.29. Socio-economic*

Impact management outcome: Socio-economic development is enhanced.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Develop and implement communication strategies to facilitate public participation;</li> <li>- Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process;</li> <li>- Sustain continuous communication and liaison with neighboring owners and residents</li> <li>- Create work and training opportunities for local stakeholders; and</li> <li>- Where feasible, no workers, with the exception of security personnel, must be permitted to stay over-night on the site. This would reduce the risk to local farmers.</li> </ul>						

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**5.30. Temporary closure of site**

Impact management outcome: Minimise the risk of environmental impact during periods of site closure greater than five days.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Bunds must be emptied (where applicable) and need to be undertaken in accordance with the impact management actions included in <i>sections 5.17: management of hazardous substances</i> and <i>5.18 workshop, equipment maintenance and storage</i>;</li> <li>- Hazardous storage areas must be well ventilated;</li> <li>- Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service;</li> <li>- Emergency and contact details displayed must be displayed;</li> <li>- Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and emergency personnel;</li> <li>- Night hazards such as reflectors, lighting, traffic signage etc. must have been checked;</li> <li>- Fire hazards identified and the local authority must have been notified of any potential threats e.g. large brush stockpiles, fuels etc.;</li> <li>- Structures vulnerable to high winds must be secured;</li> <li>- Wind and dust mitigation must be implemented;</li> <li>- Cement and materials stores must have been secured;</li> <li>- Toilets must have been emptied and secured;</li> <li>- Refuse bins must have been emptied and secured;</li> <li>- Drip trays must have been emptied and secured.</li> </ul>						

**5.31. Landscaping and rehabilitation**

Impact management outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All areas disturbed by construction activities must be subject to landscaping and rehabilitation; All spoil and waste must be disposed to a registered waste site and certificates of disposal provided;</li> </ul>						

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Impact management outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All slopes must be assessed for contouring, and to contour only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983</li> <li>- All slopes must be assessed for terracing, and to terrace only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983;</li> <li>- Berms that have been created must have a slope of 1:4 and be replanted with indigenous species and grasses that approximates the original condition;</li> <li>- Where new access roads have crossed cultivated farmlands, that lands must be rehabilitated by ripping which must be agreed to by the holder of the EA and the landowners;</li> <li>- Rehabilitation of tower sites and access roads outside of farmland;</li> <li>- Indigenous species must be used for with species and/grasses to where it compliments or approximates the original condition;</li> <li>- Stockpiled topsoil must be used for rehabilitation (refer to Section 5.24: <i>Stockpiling and stockpiled areas</i>);</li> <li>- Stockpiled topsoil must be evenly spread so as to facilitate seeding and minimise loss of soil due to erosion;</li> <li>- Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed;</li> <li>- Subsoil must be ripped before topsoil is placed;</li> <li>- The rehabilitation must be timed so that rehabilitation can take place at the optimal time for vegetation establishment;</li> <li>- Where impacted through construction related activity, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled;</li> <li>- Sloped areas stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly;</li> <li>- Spoil can be used for backfilling or landscaping as long as it is covered by a minimum of 150 mm of topsoil.</li> <li>- Where required, re-vegetation including hydro-seeding can be enhanced using a vegetation seed mixture as described below. A mixture of seed can be used provided</li> </ul>						

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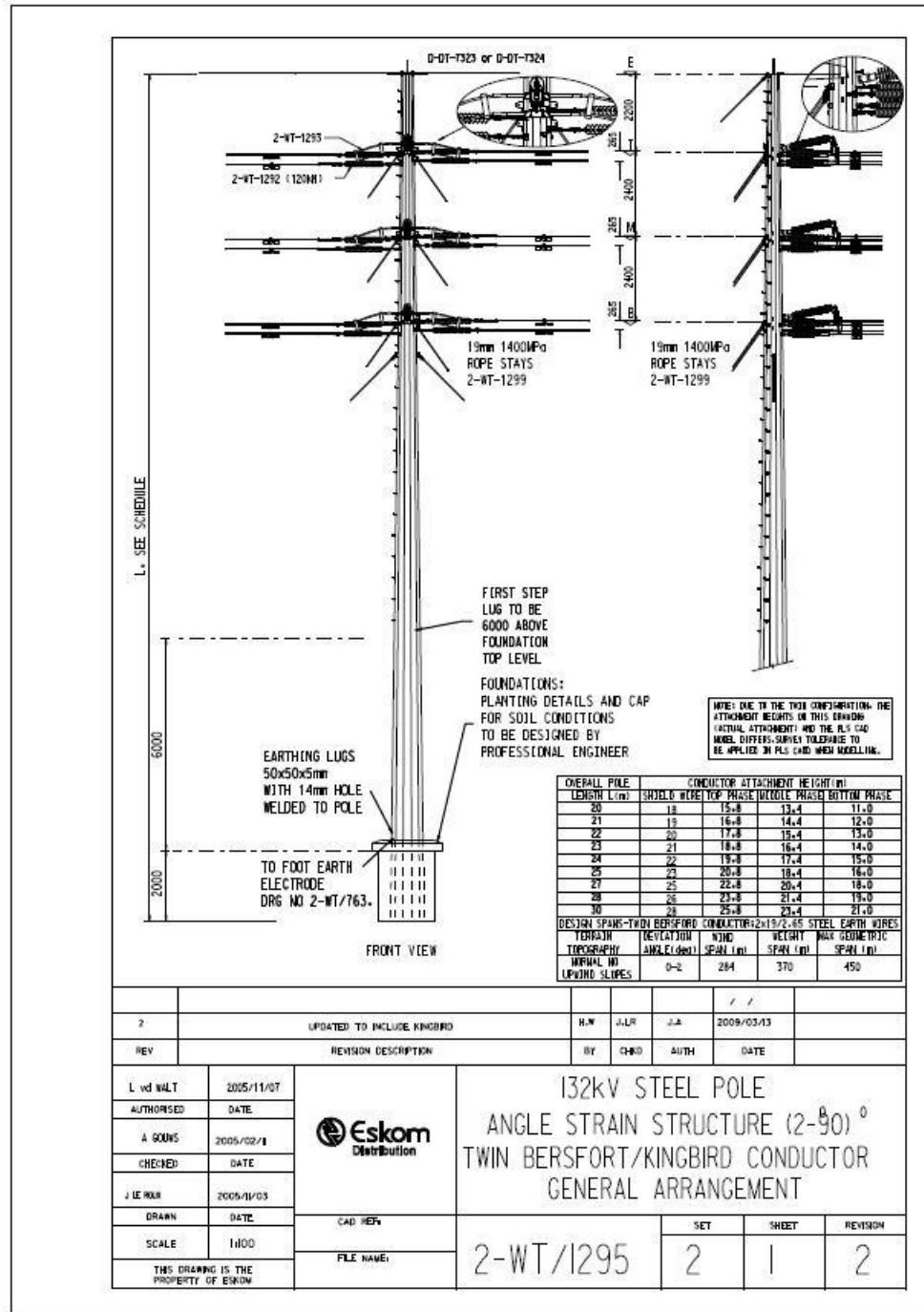
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Impact management outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
the mixture is carefully selected to ensure the following: a) Annual and perennial plants are chosen; b) Pioneer species are included; c) Species chosen must be indigenous to the area with the seeds used coming from the area; d) Root systems must have a binding effect on the soil; e) The final product must not cause an ecological imbalance in the area						

**6. ACCESS TO THE GENERIC EMPr**

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

# 10 APPENDIX C – GENERAL ARRANGEMENT OF THE STEEL MONOPOLE STRUCTURE; AND RAILWAY CROSSING CONCEPT DIAGRAM



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