

# 2019

**DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE  
PROPOSED DEVELOPMENT OF SIYATHEMBA 20MVA 88/22kV SWITCHING  
STATION AND ASSOCIATED INFRASTRUCTURE WITHIN THE  
JURISDICTION OF DIPALESENG LOCAL MUNICIPALITY, MPUMALANGA  
PROVINCE**

**AUGUST 2019**







DOCUMENT CONTROL

**DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE PROPOSED DEVELOPMENT OF SIYATHEMBA 20MVA 88/22kV SWITCHING STATION AND ASSOCIATED INFRASTRUCTURE WITHIN THE JURISDICTION OF DIPALESENG LOCAL MUNICIPALITY, MPUMALANGA PROVINCE**

**Quality Control**

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## TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION .....</b>	<b>7</b>
<b>2</b>	<b>DETAILS AND EXPERTISE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER .....</b>	<b>7</b>
<b>3</b>	<b>PROJECT BACKGROUND .....</b>	<b>9</b>
<b>4</b>	<b>PURPOSE AND SCOPE OF THE EMPR.....</b>	<b>9</b>
<b>5</b>	<b>DESCRIPTION OF LOCALITY.....</b>	<b>10</b>
<b>6</b>	<b>GENERAL ENVIRONMENTAL GUIDELINES FOR THE CONSTRUCTION PHASE.....</b>	<b>12</b>
<b>7</b>	<b>APPLICABLE LEGISLATION .....</b>	<b>12</b>
7.1	METHOD STATEMENTS FOR THE ACTIVITIES TO BE CARRIED OUT .....	15
<b>8</b>	<b>PROJECT TEAM.....</b>	<b>16</b>
8.1	ROLES AND RESPONSIBILITIES OF THE PROJECT TEAM .....	16
8.1.1	Environmental Control Officer .....	16
8.1.2	Contractor .....	18
8.1.3	Authorising Department .....	18
<b>9</b>	<b>DESCRIPTION OF MITIGATION MEASURES .....</b>	<b>18</b>
<b>10</b>	<b>PRE- CONSTRUCTION MANAGEMENT PROGRAMME .....</b>	<b>19</b>
10.1	COMMISSIONING OF TENDER.....	19
10.2	SEARCH AND RESCUE OF SPECIES OF CONCERN.....	19
<b>11</b>	<b>CONSTRUCTION MANAGEMENT PROGRAMME .....</b>	<b>20</b>
11.1	SITE ESTABLISHMENT .....	20
11.1.1	Site Plan:.....	20
11.1.2	Site Camps: .....	21
11.1.3	Vegetation clearing: .....	21
11.1.4	Water for human consumption: .....	22
11.1.5	Sewage Treatment:.....	22
11.2	SENSITIVE ECOLOGY .....	22
11.3	MATERIALS HANDLING, USE AND STORAGE .....	24
11.3.1	Safety:.....	25
11.3.2	Hazardous Material Storage: .....	25
11.3.3	Fuels and Gas Storage:.....	25
11.4	CONSTRUCTION AND OPERATION EMPR TRAINING.....	26
11.5	WATER SUPPLY.....	26

11.6	VEHICULAR ACCESS AND MOVEMENT OF CONSTRUCTION VEHICLES.....	27
11.7	MOVEMENT OF CONSTRUCTION PERSONNEL AND EQUIPMENT .....	29
11.8	VEGETATION.....	30
11.9	PROTECTION OF FAUNA AND AVIFAUNA.....	34
11.10	HERITAGE AND/OR ARCHAEOLOGICAL SITES.....	37
11.11	SERVICING AND RE-FUELLING OF CONSTRUCTION EQUIPMENT .....	39
11.12	WASTE MANAGEMENT .....	41
11.12.1	SOLID WASTE MANAGEMENT .....	41
11.12.2	LIQUID WASTE MANAGEMENT.....	42
11.12.3	HAZARDOUS WASTE.....	43
11.13	SURFACE AND GROUND WATER MANAGEMENT .....	44
11.14	SENSITIVE AREAS (WATER COURSES AND BUFFERS) .....	46
11.15	HAZARDOUS MATERIALS.....	48
11.16	OIL SPILL MANAGEMENT .....	49
11.17	STORM WATER MANAGEMENT.....	49
11.18	FIRE .....	51
11.19	AIR POLLUTION .....	52
11.20	NOISE .....	53
11.21	VISUAL.....	54
11.21.1	ACCESS ROUTES .....	54
11.21.2	CLEARED SERVITUDES .....	55
11.21.3	CONSTRUCTION CAMPS AND LAY DOWN YARDS .....	56
11.21.4	GENERAL.....	57
11.22	EXCAVATION, BACKFILLING AND TRENCHING .....	59
11.23	AGRICULTURAL ACTIVITIES .....	59
11.24	EROSION AND CONTROL.....	61
11.25	USE OF CEMENT AND CONCRETE .....	63
11.26	SITE CLEAN-UP AND REHABILITATION .....	64
11.27	GEOLOGY AND TOPOGRAPHY.....	66
11.28	MONITORING OF EMPR COMPLIANCE .....	67
11.29	DOCUMENT CONTROL .....	68
<b>12</b>	<b>OPERATION MANAGEMENT PROGRAMME .....</b>	<b>69</b>
	<b>THIS SECTION PROVIDES THE DESCRIPTION OF THE POSSIBLE IMPACTS AND ITS MITIGATION MEASURES ASSOCIATED WITH THE OPERATIONAL PHASE. ....</b>	<b>69</b>
12.1.1	Waste Management.....	69
12.1.2	Health and Safety .....	69
<b>13</b>	<b>GENERIC CONDITIONS .....</b>	<b>70</b>
13.1	AUDITS .....	71

13.2	ACCESS TO DOCUMENTS .....	72
13.3	SOCIO-CULTURAL ISSUES .....	72
<b>14</b>	<b>FAILURE TO COMPLY WITH THE ENVIRONMENTAL CONSIDERATIONS .....</b>	<b>72</b>
<b>15</b>	<b>AMENDMENT OF CONSTRUCTION AND OPERATION EMPR.....</b>	<b>73</b>

**LIST OF TABLES**

Table 1: Details of the EAP .....	8
Table 2: Legislation pertaining to the proposed project.....	12

**LIST OF FIGURES**

<b>Figure 1: Locality Map for the proposed Siyathemba substation.....</b>	<b>11</b>
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ACRONYMS	
CARA	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)
CEO	Contractor Environmental Officer
EMPr	Environmental Management Programme
DAFF	Department of Agriculture, Fisheries and Forestry
DEA	Department of Environmental Affairs
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EA	Environmental Authorisation
ECA	Environment Conservation Act, 1989 (Act 73 of 1989)
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
HSA	Hazardous Substance Act, 1973 (Act 15 OF 1973)
HIA	Heritage Impact Assessment
KM	Kilometres
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998)
NEMWA	National Environmental Management Waste Act, 2008 (Act 36 of 2008)
NEMAQA	National Environmental Air Quality Act, 2004 (Act 39 of 2004)
NEMBA	National Environmental Management Biodiversity Act, 2004 (Act 10 of 2004)
NHRA	National Heritage Resources Act, 1999 (Act 25 of 1999)
NWA	National Water Act, 1998 (Act 36 of 1998)
OHSA	Occupational Health and Safety Act, 1993 (Act of 85 of 1993)
SACNASP	South African Council of Natural Scientist Profession
SAHRA	South African Heritage Resources Agency
WULA	Water Use Licence Application

## 1 INTRODUCTION

This Environmental Management Programme (EMPr) has been compiled for: the proposed development of Siyathemba substation consists of 2 x 5MVA 88kV/6.6kV transformers within the jurisdiction of Dipaleseng Local Municipality in the Mpumalanga Province. The proposed substation construction have major impacts on the environment, as such, an environmental authorization needs to be obtained prior to commencement of the activity/ies in accordance with the requirements of the National Environmental Management Act, 1998 (Act 107 of 1998) [NEMA] and the Environmental Impact Assessment (EIA) Regulations of 2014 as amended. It is therefore imperative that precautions are taken to ensure that environmental degradation is minimized while the project is undertaken. This will take a concerted effort from the project team and proper planning is of the utmost importance.

Consequently, Nsovo Environmental Consulting (hereafter referred to as Nsovo) has been appointed by Dipaleseng Local Municipality (hereafter referred to DLM) to undertake a Basic Assessment (BA) process for the proposed development of a substation. As part of the BA process an EMPr must be prepared as a guideline for the mitigation and management measures to be implemented during the planning, construction and operational phases of the project.

This EMPr is applicable to all the employees and contractors of Municipality working on the development. The document will be adhered to and updated as relevant; it is therefore a living document that guides the day to day activities throughout the lifecycle of the development. Any changes to the EMPr must be undertaken in accordance with the requirements of the NEMA EIA Regulations and any other legislation relevant at the time. This EMPr has been developed to ensure compliance with the requirements of the National legislative - and other relevant regulatory requirements

## 2 DETAILS AND EXPERTISE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

Nsovo has been appointed as an independent Environmental Assessment Practitioner (EAP) for the proposed project and meets the general requirements as stipulated in Regulations 13 (3) of the NEMA EIA 2014 Regulations as amended. Nsovo therefore is:

- Independent and objective;
- Has expertise in conducting EIA's;
- Takes into account all relevant factors relating to the application; and
- Provides full disclosure to the applicant and the relevant environmental authority.

**Table 1** below provides the details of the EAP and relevant experience. A detailed CV and qualifications of the EAP is attached as **Appendix E1**.

**Table 1: Details of the EAP**

Name of Company	Nsovo Environmental Consulting
Person Responsible	Masala Mahumela
Professional Registration	South African Council for Natural Scientific Professions (SACNASP)
Postal Address	P/Bag x29 Post net Suite 697 Gallo Manor 2052
Telephone Number	011 041 3689
Fax Number	086 602 8821
Email	<a href="mailto:Masala.mahumela@nsovo.co.za">Masala.mahumela@nsovo.co.za</a>
Qualifications & Experience	B.Sc. Honours Environmental Management 10 years of experience
Project Related Expertise	In terms of project related expertise, the EAP has worked on the following projects: <ul style="list-style-type: none"> <li>• EIA for the proposed Shongweni substation and Hector - Shongweni 400kV powerline in Kwazulu Natal Province.</li> <li>• EIA for the proposed Inyaninga substation and Inyaninga – Mbewu 400kV powerline in Kwazulu Natal Province.</li> <li>• EIA for the proposed Tubatse strengthening Phase 1 – Senakangwedi B integration within the jurisdiction of Greater Tubatse Local Municipality in Limpopo Province.</li> <li>• EMP, WULA and EA amendment for the proposed Juno - Gromis 400kV power line.</li> <li>• Basic Assessment for the proposed Decommissioning and Demolition of Verwoedberg Substation and 275kV power.</li> </ul>



### 3 PROJECT BACKGROUND

Eskom is supplying the Local Municipality (via Balfour Town Substation) with a Noted Maximum Demand (N.M.D) of 7.5MVA. The substation consists of 2 x 5MVA 88kV/6.6kV transformers and the peak demand was recently recorded to be 7.2 MVA.

Furthermore, Eskom also distributes (at 22kV) to identified rural settlements in the vicinity of Balfour substation through a 1 x 5MVA 88/22kV transformer. The municipality initiated a project to establish a new 88/22kV Siyathemba substation with an end state capacity of 20 MVA. The project will entail the entire substation infrastructure (primary, secondary plant and civil associated works) and the 132kV feeder (Operated at 88kV) from Eskom switching station into the newly proposed Siyathemba substation. The existing Balfour Municipal Substation will be reconfigured and the load will be shifted to the new Siyathemba substation.

The Balfour town substation recorded an increase in consumption and a need for a network expansion plan was then justified. The municipality also experienced several unplanned outages due to a significant load increase on the North side of Balfour town. The infrastructure is obsolete and has a negative impact on the quality of supply. In essence, the existing 2 x 5MVA transformers installed at Balfour Substation are too small to cater for the current loading in Balfour and Siyathemba area.

The current electricity network does not have spare capacity to accommodate future residential developments and potential industries.

The proponent for the proposed development is Dipaleseng Local Municipality (DLM) whereas the Competent Authority (CA) is the National Department of Environmental Affairs (DEA). The proposed project will be undertaken in terms of the National Environmental Management Act, 1998 (NEMA 107 of 1998) and the EIA Regulation of December 2014 (as amended in April 2017), other applicable Acts and Legislation will be equally considered.

The EMPr is prepared for the proposed project and will address mitigation measures for the identified impacts during the pre-construction, construction and operational phases.

### 4 PURPOSE AND SCOPE OF THE EMPR

The EMPr sets out general environmental specifications, which are applicable to the construction activities associated with the proposed project. This document serves as a guideline for the management of the site and provides specifications and Regulations that must in all instances be adhered to. It is the responsibility of all parties, including contractors and sub-contractors, involved in the project to commit themselves to the implementation of the Construction and Operation EMPr in all phases of the project.

The objectives of the EMPr are to:

- Ensure that the activity is undertaken in compliance with all statutory and regulatory requirements;
- Ensure that the most updated DLM's Environmental Policy is underwritten at all times;
- All landowner special conditions are identified and taken into consideration;
- Ensure that all environmental conditions stipulated in the EA are implemented;
- Detail mitigation measures, time-frames and criteria for assessing the success or failure of each measure;
- Provide detailed monitoring programmes to ensure compliance;
- Provide input and strategies for environmental quality control and risk management;
- To preserve the natural environment by limiting destructive actions on site;
- Ensure appropriate restoration of areas affected by construction; and
- Prevent long term environmental degradation.

The purpose of the EMP is to give effect to precautionary measures, which are to be put in place for controlling the activities that will take place on site. It has been developed to ensure compliance with the national legislative and regulatory requirements as well as DLM's guidelines associated with projects of a similar nature.

## **5 DESCRIPTION OF LOCALITY**

The proposed project will be undertaken on portion 5 of Farm Vlakfonteing 5561R in Siyathemba (Enkanini) Extension 4, in Ward 3 within the jurisdiction of Dipaleseng Local Municipality in the Mpumalanga Province (refer to Figure 1 below for locality map).

**PROPOSED DEVELOPMENT SIYATHEMBA 20 MVA 88/22KV SUBSTATION AND ASSOCIATED INFRASTRUCTURE WITHIN THE JURISDICTION OF DIPALESENG LOCAL MUNICIPALITY IN MPUMALANGA PROVINCE**

Leandra  
45km North-east

Oranjeville  
53km South-west

Stuard Str

Option 2 Substation



Option 1 Substation



Villiers  
40km South

Greylingstad  
15km south-east

**LEGEND**

National Freeway, National Road	
Arterial Road	
Main Road	
Secondary Road; Bench Mark	
Other Road; Bridge	
Track and riding Trail	
Railway; Station or Siding	
Other Railway; Tunnel	
Embankment; Cutting	
Power Line	
Build-up Area (High, Low Density)	
Railings; Fence	
Post Office; Police Station; Store	
Place of Worship; School; Hotel	
Fence; Wall	
Waterway; Mooring	
Communication Tower	
Mine (Shaft); Excavation	
Trigonometrical Station; Marine Beacon	
Lighthouse and Marine Light	
Concrete; Drive	
International Boundary and Reserves	
Provincial Boundary	
Protected Area	
Perennial River	
Seasonal Water	
Non-perennial River	
Non-perennial Water	
Dry Water Course	
Marsh and Vlei	
Pipeline (above ground)	
Water Tower; Reservoir; Water Pond	
Coastal Rocks	
Provisional Rock Outcrop	
Existing Sand	
Woodland	
Cultivated Land	
Orchard or Vineyard	
Recreation Ground	
Row of Trees	

**Option 1 - Corner Points**

A	26°40'2.78"S	&	28°36'54.99"E
B	26°40'3.90"S	&	28°36'56.36"E
C	26°40'5.16"S	&	28°36'55.11"E
D	26°40'4.02"S	&	28°36'53.72"E

**Option 2 - Corner Points**

A	26°39'59.60"S	&	28°36'45.55"E
B	26°40'00.01"S	&	28°36'47.30"E
C	26°40'01.59"S	&	28°36'46.85"E
D	26°40'01.17"S	&	28°36'45.09"E

**Legend**

	Substation Option 1		Existing_11_kV_Powerline
	Substation Option 2		Existing_400_kV_Powerline
	Existing_Gas_Pipe_Servitude		Existing_88_kV_Powerline
	Vlakfontein_556_IR_Portion_5		

**LOCALITY MAP**

Sg Code:  
Vlakfontein 556 IR Portion 5 - T01R00000000055600005



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Figure 1: Locality Map for the proposed Siyathemba substation.

## 6 GENERAL ENVIRONMENTAL GUIDELINES FOR THE CONSTRUCTION PHASE

This EMPr has been compiled in fulfilment with the requirements of the National Environmental Management Act, 1998 (Act 107 of 1998). This document serves as a guideline for the management of the site by the Municipality, Contractor and subcontractors, in order to minimise adverse environmental impacts. DLM will be responsible for ensuring compliance of the Contractor with the EMPr and will rely on the Environmental Control Officer (ECO) to monitor compliance. The Contractor must in turn monitor his/her employees to ensure compliance with the provisions of this EMPr.

The main Contractor shall receive a copy of the EMPr from the Municipality and will be given the opportunity to clear any misconceptions and uncertainties. The EMPr will form part of the contract between the Municipality and the Contractor/s, and will therefore be a legally binding document. In the event of discrepancy with regard to environmental matters or environmental specifications this document shall take precedence.

## 7 APPLICABLE LEGISLATION

This list is not intended as an exhaustive analysis of the applicable environmental legislations but provides a guideline to the relevant aspects of each Act.

**Table 2: Legislation pertaining to the proposed project**

Aspect	Relevant Legislation	Brief Description
Environment	National Environmental Management: Act 1998, (Act No. 107 of 1998)	The overarching principles of sound environmental responsibility are reflected in the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), The principles set out in the National Environmental Management Act, 1998 (Act No. 107 of 1998), hereafter, referred to as NEMA, apply to all listed projects. Construction and operation have to be conducted in line with the generally accepted principles of sustainable development, integrating social, economic and environmental factors.
Biodiversity	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	The purpose of the National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As

Aspect	Relevant Legislation	Brief Description
		part of its implementation strategy, the National Spatial Biodiversity Assessment was developed.
Protected Areas	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)	The purpose of this Act is to provide for the protection, conservation and management of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes.
Heritage Resources	National Heritage Resources Act, 1999 (Act No. 25 of 1999)	The National Heritage Resources Act, 1999 (Act No. 25 of 1999) legislates the necessity for cultural and heritage impact assessment in areas earmarked for development, which exceed 0.5 ha. The Act makes provision for the potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by the South African Heritage Resources Agency (SAHRA).
Air quality management and control	National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)	<p>The object of the Act is to protect the environment by providing reasonable measures for the protection and enhancement of the air quality and to prevent air pollution.</p> <p>Section 32 of The National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) deals with dust control measures in respect of dust control. Whilst none are promulgated at present, it provides that the Minister or MEC may prescribe measures for the control of dust in specified places or areas, either in general or by specified machinery or in specified instances, the steps to be taken to prevent nuisance by dust or other measures aimed at the control of dust.</p>
Noise Management and Control	Noise Control Regulations in terms of the Environmental Conservation, 1989 (Act 73 of 1989)	The assessment of impacts relating to noise pollution management and control, where appropriate, must form part of the EMP. Applicable laws regarding noise management and control refer to the National Noise Control Regulations issued in terms of the Environment Conservation, 1989 (Act 73 of 1989).

Aspect	Relevant Legislation	Brief Description
Water	National Water Act, 1998 (Act 36 of 1998)	This Act provides for fundamental reform of law relating to water resources and use <sup>1</sup> . The preamble to the Act recognizes that the ultimate aim of water resource management is to achieve sustainable use of water for the benefit of all users and that the protection of the quality of water resources is necessary to ensure sustainability of the nation's water resources in the interests of all water users.
Agricultural Resources	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	The Act aims to provide for control over the utilization of natural agricultural resources in order to promote the conservation of the soil, water resources and vegetation and to combat weeds and invader plants. Section 6 of the Act makes provision for control measures to be applied in order to achieve the objectives of the Act.
Human	The Constitution of South Africa, 1996 (Act No. 108 of 1996)	<p>The Constitution of South Africa, 1996 (Act No. 108 of 1996) provides for an environmental right (contained in the Bill of Rights, Chapter 2). In terms of Section 7, the state is obliged to respect, promote and fulfill the rights in the Bill of Rights. The environmental right states that:</p> <p>“Everyone has the right -</p> <p>a) To an environment that is not harmful to their health or well-being; and</p> <p>b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that -</p> <ul style="list-style-type: none"> <li>-Prevent pollution and ecological degradation;</li> <li>-Promote conservation; and</li> <li>-Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”</li> </ul>

## 7.1 METHOD STATEMENTS FOR THE ACTIVITIES TO BE CARRIED OUT

Method Statements (MS) must be prepared and signed by DLM's Project Manager or Engineer, ECO and the Contractor prior to commencement of activities on site and this include but not limited to the following:

- Vegetation clearing;
- Fauna and flora management;
- Excavations for installation of foundations;
- ..Chemical/hazardous substance storage;
- Cement/concrete use;
- Environmental awareness training;
- Fire management;
- Emergency Response;
- Storm water and soil erosion management;
- Waste management;
- Access road(s);
- Contaminated water management;
- Site establishment and site layout plan;
- Use of herbicides/pesticides;
- Temporary site closure;
- Site Rehabilitation;
- Blasting;
- Alien plants removal and use of herbicides and pesticides; and
- Dust suppression.

This list has not exhausted all the activities/aspects that may require MS prior to commencement of the work. The Environmental Control Officer (ECO) may require more MSs to be submitted as the project progresses.



## 8 PROJECT TEAM

### 8.1 ROLES AND RESPONSIBILITIES OF THE PROJECT TEAM

#### 8.1.1 Environmental Control Officer

An independent ECO must be appointed to assist the Contractor(s) on site regarding environmental matters and should be on site during the entire construction phase. The primary role of the ECO is as follows:

- To provide an on-site environmental management service to DLM to ensure effective implementation of EA, EMPr and landowner conditions.
- To ensure implementation and compliance with any DLM site procedures and requirements.
- Be responsible for the planning and management of all environmental activities for this position, but more specifically the following:

#### Communication Services

- To liaise closely with the DLM and Contractor's Environmental Officer (CEO).
- To ensure that the landowner agreed General and Special Conditions are implemented.
- To agree with landowner on the bush clearing method.
- To assist in conflict resolution.
- To ensure that the Contractor rehabilitates any damage caused during construction.
- To indicate where bird guards, bird diverters, bird lights and aviation warning spheres are to be installed as specified in the EMPr, EA conditions and or the line profile.
- After the final rehabilitation has been completed on a property, to obtain the immediate release from the landowner.

#### Environmental Management

- Monitoring of site environmental progress in respect of time, deliverables and quality.
- Liaison between Project Manager, SHEQ/SHE/Environmental Manager, Senior Environmental Advisor, Site Supervisor, CEO, affected and interested parties, authorities and stakeholders on environmental matters.
- Recommending EMPr modifications to the Project/SHEQ/SHE/Environmental Manager as and when the particular site conditions warrant it.
- Communicating changes of the EMPr to all relevant parties.
- Maintaining climatic data on an ECO register using DLM/Contractor EO readings.
- Issuing Contractors Communications and Site Instructions via the Site Supervisor or delegated person as delegated by the Project Manager.



- Monitoring performance of Contractor and sub-contractors to ensure compliance with environmental and statutory requirements.
- Validating the regular site inspection reports prepared by the CEO.
- Checking the CEO's record of environmental incidents (spills, impacts, legal transgressions, etc.) as well as corrective and preventive actions taken.
- Checking the CEO's complaints register in which all complaints are recorded, as well as actions taken.
- Assisting in the resolution of environmental related conflicts.
- Compiling and completing the environmental management related component of the handing-over documentation and any other related documents.
- Timeously identifying any sensitive site issues which may affect environmental aspects and the reporting of this to the Project/SHEQ/SHE/Environmental Manager.
- Monitoring that good housekeeping practices are followed and maintained by the Contractor.
- Monitoring that the ground rehabilitation is initiated on time, complying with the EA, EMPr and to the satisfaction of the landowner.
- Assisting the Contractor and DLM EO with the environmental awareness training course to all site staff, targeted at the level of the workers so that they have a basic understanding of the environment that they are working in. The Contractor will provide an interpreter if needed.
- Monitoring that sensitive areas are demarcated within or alongside the construction areas i.e. sites identified in the EMPr, EA. All personnel are to be informed of such sites and the reason the site is demarcated.

### **Monitoring**

- Validating the site environmental monitoring plan.
- Validating the "Punch List/daily pre-warning" and reporting all defects and non-conformances as per the Control of Nonconformity Procedure.
- Carrying out environmental surveillances.
- Validating and recording of certificates proving the legal disposal of waste streams.

### **Reporting**

- To complete a daily diary and monthly (completed by the 24th of each month) reporting to Land and Rights and the Project/SHEQ/SHE/Environmental.
- To prepare monthly monitoring reports for submission to the DEA, Environmental Compliance Section as and when required.
- Manage the compliance of the Contractor according to the Environmental Authorization, EMPr and landowner conditions. The reports are to include photographic images of special occurrences taking place during the reporting period.

- To attend site meetings as required.
- To inform Land Development and Management and the Project/SHEQ/SHE/Environmental Manager of any activity that is not in accordance with the EA and respective Conditions, the EMP and Landowner' agreed general and special conditions or detrimental to the environment.

### **Administration**

- To assure a proper site ECO administration function to cater for all environmental site related correspondence.
- To execute environmental responsibilities as per DLM's Risk Management System.
- To promote and maintain sound relationships with the landowner, community, Contractors and suppliers.

### **8.1.2 Contractor**

- To provide all necessary supervision during the execution of the project. He/ She must be available on site at all times.
- To appoint a competent Contractor Environmental Officer (CEO).
- To implement the projects as per the approved project plan.
- To ensure that implementation is conducted in an environmentally acceptable manner.
- To fulfil all obligations as per the agreed contract.
- To comply with special conditions as stipulated by landowners during the negotiation process.
- To inform and educate all employees about the environmental risks associated with the different construction activities and lessen significant impacts to the environment.
- Report environmental incidents.
- Provides environmental training.
- Ensures compliance with pertinent environmental legislations and other legally binding documents.

### **8.1.3 Authorising Department**

The role of the Authority is to enforce compliance with the EA and associated amendments as well as the EMP.

## **9 DESCRIPTION OF MITIGATION MEASURES**

This section serves to prescribe mitigation measures to prevent, reduce, eliminate or compensate for impacts, to acceptable/insignificant levels.

## 10 PRE- CONSTRUCTION MANAGEMENT PROGRAMME

The pre-construction management programme is to be used as a guide during the planning, design and detailing of the development components. This part of the programme is to be referenced by all involved in decision making during the planning and design phases.

### 10.1 COMMISSIONING OF TENDER

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
Ensure that proper environmental conditions are established prior to commencing with construction by informing all parties of appropriate environmental protection measures.	<ul style="list-style-type: none"> <li>The successful bidding Contractors must be made aware of the contents of this EMPr and any penalties arising from noncompliance prior to the commencement of work.</li> <li>All Contractors must be made aware of the audit and monitoring requirements as stipulated in this EMPr.</li> <li>The Authorisation Holder must appoint an Environmental Control Officer (ECO) who will be responsible to monitor compliance to the EMPr and EA as well as other permits and license requirements; and</li> <li>Inform the Competent Authority of the appointment of the ECO and provide the candidate's contact details.</li> </ul>	<ul style="list-style-type: none"> <li>Signed Declaration by contractor.</li> <li>Appointment Letter</li> <li>Proof of submission to DEA.</li> </ul>	<ul style="list-style-type: none"> <li>DLM</li> <li>Contractor</li> </ul>	Prior commencement of construction activities

### 10.2 SEARCH AND RESCUE OF SPECIES OF CONCERN

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>To conserve protected and other species.</li> </ul>	<ul style="list-style-type: none"> <li>The development fall within a CBA and the loss of habitat in CBAs may impact the ecological functioning of the CBAs and reduce biodiversity within the affected areas site.</li> <li>Application for all the necessary plant removal</li> </ul>	<ul style="list-style-type: none"> <li>Permits</li> <li>Agreements with safe receiving placing and associated receipts.</li> </ul>	<ul style="list-style-type: none"> <li>DLM</li> <li>Contractor</li> </ul>	Prior commencement of construction activities

	<p>/relocation permits form the responsible authorities must be undertaken accordingly.</p> <ul style="list-style-type: none"> <li>• Suitable safe receiving areas should be identified prior to search and rescue commencing.</li> <li>• Search and rescue of all identified species of conservation concern that will be disturbed should be undertaken.</li> <li>•</li> </ul>			
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## 11 CONSTRUCTION MANAGEMENT PROGRAMME

### 11.1 SITE ESTABLISHMENT

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
To ensure minimal disturbance of the environment during the site establishment.	<p>Construction camps on the site must be established on least sensitive locations preferably within already disturbed areas. After completion of the construction activities, these areas must be rehabilitated.</p> <p><b>11.1.1 Site Plan:</b></p> <p>Documentation for the proposed camp site must be prepared by the Contractor prior to the commencement of construction activities and must be submitted to DLM for approval. This documentation must include, but not limited to the following:</p> <ul style="list-style-type: none"> <li>• Site access (including entry and exit points).</li> <li>• All material and equipment storage areas including storage areas for hazardous substances.</li> <li>• Construction offices and other structures.</li> <li>• Security requirements including temporary and</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Site Plan</li> <li>• Landowner agreements</li> </ul>	<ul style="list-style-type: none"> <li>• ECO</li> <li>• Contractor</li> <li>• CEO</li> </ul>	Prior to site establishment

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	<p>permanent fencing, and lighting.</p> <ul style="list-style-type: none"> <li>• Solid waste management facilities.</li> <li>• Storm water control measures.</li> <li>• Provision of potable water and mobile chemical ablution facilities.</li> </ul> <p>Throughout the period of construction, the Contractor shall restrict all activities to within the designated areas as per the construction layout plan. Any relaxation or modification of the construction layout plan shall be approved by the ECO.</p> <p><b>11.1.2 Site Camps:</b></p> <p>The following restrictions shall be placed on the site camp for the construction staff in general:</p> <ul style="list-style-type: none"> <li>• The use of water courses for washing of clothes.</li> <li>• The use of welding equipment, oxy-acetylene torches and other bare flames where veld fires can be a hazard.</li> <li>• Collection of firewood.</li> <li>• Poaching of any form.</li> <li>• Use of surrounding veld as toilets.</li> </ul> <p><b>11.1.3 Vegetation clearing:</b></p> <ul style="list-style-type: none"> <li>• The natural vegetation encountered on site must be conserved and left intact as much as possible.</li> <li>• Only flora within the construction footprint must be cleared. Clearance must be as per the approved Method statement in line with DLM policies.</li> <li>• Search and rescue should be done by a suitable</li> </ul>			

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	<p>Specialist in accordance with the permit requirements from the responsible authorities and in consultation with the ECO.</p> <p><b>11.1.4 Water for human consumption:</b> Water for human consumption must be available at all times.</p> <p><b>11.1.5 Sewage Treatment:</b></p> <ul style="list-style-type: none"> <li>• Chemical toilets must be supplied at a ratio of 1 toilet per 15 persons and must be regularly cleaned and maintained by the Contractor.</li> <li>• The Contractor must arrange for regular emptying of toilets and shall be entirely responsible for enforcing their use and for maintenance.</li> <li>• The ablution facilities must be at least 100m away from the identified watercourses and associated buffers.</li> <li>• All ablution facilities must be anchored to prevent them from being toppled by the wind. Only rigid material such as steel wires and droppers will be used for anchoring of toilets. No conductors or rope may be used for this purpose.</li> </ul>			

## 11.2 SENSITIVE ECOLOGY

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>• To ensure that the sensitive area is not disturbed.</li> <li>• To ensure minimal or if all</li> </ul>	<p>The proposed development will encroach on sensitive environments including Critical Biodiversity Areas (CBA).</p> <ul style="list-style-type: none"> <li>• It is recommended that search and rescue be done and</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• ECO to monitor</li> </ul>	<ul style="list-style-type: none"> <li>• DLM</li> <li>• Contractor</li> </ul>	Prior to construction

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<p>possible no disturbance to the vegetation on and around the site.</p>	<p>biodiversity permit applications made to the relevant authority for removal and relocation.</p> <ul style="list-style-type: none"> <li>• Where possible construction in high sensitive areas must take place during the dry season to minimise impacts on bulbs and annuals.</li> <li>• No laydown areas may be located within identified areas of high ecological sensitivity.</li> <li>• Creation of new access tracks should be minimised in all areas of natural vegetation.</li> <li>• Point out and/or demarcate all ecologically “sensitive” areas to the contractors (e.g. red data habitats &amp; species, water courses, sensitive soils, steep slopes and areas susceptible to erosion).</li> <li>• Demarcate and create a DWS approved buffer for the area near the wetlands and consider it a no-go area.</li> <li>• Ensure that ‘No-Go’ areas are clearly demarcated and/or fenced before construction starts. Barriers must be maintained in good order throughout the course of the construction.</li> <li>• Avoid construction in sensitive vegetation types and wetland areas. The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.</li> <li>• Construction activities must be restricted to the immediate footprint of the infrastructure to avoid any additional disturbance impacts on bird species residing in the broader area.</li> <li>• Access to the remainder of the site must be strictly controlled to prevent unnecessary disturbance of Red</li> </ul>	<ul style="list-style-type: none"> <li>• Site plan</li> </ul>		

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	<p>Data species.</p> <ul style="list-style-type: none"> <li>Maximum use must be made of existing access roads and the construction of new roads should be kept to a minimum.</li> <li>Measures to control noise must be applied according to current best practice in the industry.</li> </ul> <p><b>WETLAND AND STREAM</b></p> <p>No streams or wetlands will be crossed by the substation; however, there is an artificial wetland approximately 240m to the south-east of the proposed site. Undue disturbance of the wetland must be prohibited.</p> <ul style="list-style-type: none"> <li>Should there be a need to disturb the wetland a water use license must be obtained from the Department of Water and Sanitation prior to commencement of work.</li> <li>Rehabilitate disturbances close to wetland as a matter of urgency.</li> <li>Rehabilitated areas must be monitored to ensure the establishment of re-vegetated areas.</li> <li>Remove and control all alien plant species that may appear during construction phase.</li> </ul>			

### 11.3 MATERIALS HANDLING, USE AND STORAGE

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>To ensure safe handling, storage use and disposal of hazardous</li> </ul>	<p>The Contractor's management and maintenance of plant and machinery will be strictly monitored according to the criteria given below:</p>	<ul style="list-style-type: none"> <li>Observation</li> <li>Incident Report</li> </ul>	<p>ECO &amp; Contractor CEO</p>	<p>Continuous throughout the construction phase</p>



Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<p>substances.</p> <ul style="list-style-type: none"> <li>To ensure full compliance with the requirements of the applicable legislation.</li> </ul>	<p><b>11.3.1 Safety:</b></p> <ul style="list-style-type: none"> <li>All the necessary handling and safety equipment required for the safe use of hydrocarbons shall be provided by the Contractor to be used and/or worn by the staff.</li> <li>The Contractor must comply with the Occupational Health and Safety Act, 1993 (Act 85 of 1993) and Construction Regulations, 2003 as this governs what the Contractor must do and provide for his staff.</li> </ul> <p><b>11.3.2 Hazardous Material Storage:</b></p> <ul style="list-style-type: none"> <li>Hydrocarbons and hazardous substances must only be stored under controlled conditions.</li> <li>All hazardous materials must be stored in a secured, designated area with restricted entry.</li> <li>Storage of hazardous products must only be in suitable containers. The containers must indicate the nature of the stored materials and Material Safety Data Sheets (MSDS) must be available on site.</li> </ul> <p><b>11.3.3 Fuels and Gas Storage:</b></p> <ul style="list-style-type: none"> <li>Should fuel be stored on site, it must be stored in a steel tank supplied and maintained by the Contractor according to safety procedures.</li> <li>The tanks/ bowsers shall be situated on a smooth impermeable surface (concrete) with a permanent bund. The</li> </ul>			

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	<p>impermeable lining shall extend to the crest of the bund and the volume inside the bund shall be 110% of the total capacity of all the storage tanks/ bowers.</p> <ul style="list-style-type: none"> <li>Gas welding cylinders and LPG cylinders must be stored in a secure, well-ventilated area. The Contractor must supply sufficient fire fighting equipment;</li> <li>No smoking is allowed where fuel is stored and used. Smoking must only be at a designated smoking area.</li> </ul>			

#### 11.4 CONSTRUCTION AND OPERATION EMPR TRAINING

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
To ensure that all site personnel have basic level of environmental awareness training.	<ul style="list-style-type: none"> <li>The CEO shall arrange for Environmental Awareness Training programs for all personnel on site.</li> <li>The training must include the content of the EMPr and the CEO must sensitise the team on the importance of compliance.</li> <li>Daily toolbox talks must be undertaken by the CEO and an attendance register kept on site.</li> </ul>	<ul style="list-style-type: none"> <li>Signed training attendance Register</li> <li>Declaration of good conduct signed by all site personnel</li> </ul>	<ul style="list-style-type: none"> <li>CEO</li> </ul>	Prior construction commencement and to continue throughout construction phase.

#### 11.5 WATER SUPPLY

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>To ensure availability of water for various uses as and when required.</li> <li>To ensure that water usage is minimised.</li> <li>To conserve water resources at all times.</li> <li>To encourage a 3R (Reduce, Reuse, Recycle) system.</li> </ul>	<ul style="list-style-type: none"> <li>The Contractor must ensure that all water sources are authorised and proof of such must be presented to the ECO.</li> <li>Contractor must ensure absolute conservation of water throughout construction.</li> <li>Contractor must supply potable water for human consumption at all times.</li> </ul>	Water consumption record	<ul style="list-style-type: none"> <li>ECO</li> <li>Contractor</li> </ul>	Ongoing during the construction phase

#### 11.6 VEHICULAR ACCESS AND MOVEMENT OF CONSTRUCTION VEHICLES

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Damage to protected /endangered vegetation.</li> <li>Damage to sensitive areas.</li> </ul>	<ul style="list-style-type: none"> <li>To prevent ecological damage.</li> <li>Minimise damage to the identified watercourse</li> </ul>	<ul style="list-style-type: none"> <li>CARA</li> <li>NEMBA</li> <li>NWA</li> </ul>	<ul style="list-style-type: none"> <li>A physical access Method Statement along the servitude shall be compiled by the Contractor and accepted by the ECO and DLM Representative.</li> <li>Access roads must be maintained by the Contractor. The Contractor shall erect and maintain marker pegs along</li> </ul>	<ul style="list-style-type: none"> <li>Access plan approved by the ECO</li> <li>No complaints from landowners.</li> <li>No access</li> </ul>	<ul style="list-style-type: none"> <li>Photographic record of private roads prior to the Contractor using the roads. Site</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> <li>Contractor</li> <li>CEO</li> </ul>	Continuous during the construction phase

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Erosion and loss of topsoil.</li> </ul>	<p>s.</p> <ul style="list-style-type: none"> <li>Minimise erosion of embankments and subsequent siltation of watercourses.</li> </ul>		<p>the boundaries of the working areas, access roads, haul roads or paths before commencing any other work. If proved insufficient for control, these will be replaced. Ensure that access roads to the site are of a suitable quality to eliminate soil erosion and channel storm water.</p> <ul style="list-style-type: none"> <li>No illegal use of private roads during construction.</li> <li>Where it is necessary for access roads to traverse drainage lines, rocky drift crossings should be used as these have little impact on flow pattern, but limit erosion and other impacts.</li> <li>Upon completion of the project all roads required for operational phase shall be maintained and repaired as required.</li> <li>Roads not required for maintenance activities during the operational phase must be fully rehabilitated.</li> </ul>	<p>roads through Wetlands.</p> <ul style="list-style-type: none"> <li>No visible erosion scars once construction is completed</li> <li>Erosion is not evident on slopes.</li> <li>Use of designated access roads</li> <li>No complaints from the landowners</li> <li>No destruction of or damage to known archaeological sites.</li> </ul>	<p>plan</p> <ul style="list-style-type: none"> <li>Regular monitoring of access roads conditions</li> <li>Monitoring of impacts into the surrounding areas</li> </ul>		

## 11.7 MOVEMENT OF CONSTRUCTION PERSONNEL AND EQUIPMENT

Possible Impact	Objective	Applicable Legislation / Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Impact on sensitive environments.</li> <li>Trespassing</li> <li>Safety and security.</li> </ul>	<ul style="list-style-type: none"> <li>To ensure controlled and manageable movement of personnel and equipment.</li> </ul>	<ul style="list-style-type: none"> <li>TRMPV ACV2 REV1</li> </ul>	<ul style="list-style-type: none"> <li>The Contractor must ensure that all construction personnel, labourers and equipment remain within the demarcated construction sites at all times.</li> <li>Where construction personnel move outside the boundaries of the site, the Contractor/ labourers must obtain permission from the CEO.</li> <li>All equipment moved onto site or off site is subject to the legal requirements as well as DLM specifications for the transport of such equipment. The Contractor shall meet these safety requirements under all circumstances.</li> <li>All equipment transported shall be clearly labelled as to their potential hazards according to specifications.</li> <li>All the required safety labelling on the containers and trucks used shall be in</li> </ul>	<ul style="list-style-type: none"> <li>No trespassing of contractor's workforce.</li> <li>No complaints from landowners.</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Security registers.</li> <li>Complaints register</li> </ul>	<ul style="list-style-type: none"> <li>ECO &amp;</li> <li>Contractor</li> </ul>	Continuous throughout the construction phase.

Possible Impact	Objective	Applicable Legislation / Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p>place.</p> <ul style="list-style-type: none"> <li>The Contractor shall ensure that all the necessary precautions against damage to the environment and injury to persons are taken in the event of an accident and shall provide a Method Statement to that effect.</li> <li>The Contractor is to ensure that no machinery, personnel, material, or equipment enters 'No-Go' areas during the course of the project.</li> </ul>				

## 11.8 VEGETATION

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Damage to protected/en dangered vegetation</li> <li>Damage to topsoil</li> </ul>	<ul style="list-style-type: none"> <li>To conserve flora.</li> <li>To ensure the control of alien invasive species and to</li> </ul>	<ul style="list-style-type: none"> <li>NEMBA</li> <li>CARA</li> </ul>	<p>The alignment may traverse sensitive vegetation therefore the following is recommended:</p> <ul style="list-style-type: none"> <li>Existing roads and access routes should be used wherever possible.</li> <li>Ensure that lay-down and other</li> </ul>	<ul style="list-style-type: none"> <li>No alien species</li> <li>No disturbance of protected flora</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Complaints register</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> <li>Contractor</li> <li>CEO</li> </ul>	On-going during the construction phase.

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	ensure that rehabilitation is as close as possible to the original state		<p>temporary infrastructure is within low sensitivity areas, preferably previously transformed areas if possible.</p> <ul style="list-style-type: none"> <li>Minimise the development footprint as far as possible and rehabilitate disturbed areas that are no longer required by the operational phase of the development.</li> <li>Demarcate all areas to be cleared with construction tape or other appropriate and effective means. However, caution should be exercised to avoid using material that might entangle fauna.</li> <li>Demarcate the construction footprint.</li> <li>The natural vegetation encountered on the site is to be conserved and left intact as much as possible.</li> <li>Only vegetation directly affected by the works may be felled or cleared.</li> <li>The clearing of vegetation must be</li> </ul>	<ul style="list-style-type: none"> <li>Minimal disturbance of vegetation including crops</li> </ul>			

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p>kept to a minimum and remain within the footprint of the pylon;</p> <ul style="list-style-type: none"> <li>Disturbed areas must be rehabilitated immediately after construction has been completed in that area by using appropriate measures such as sowing appropriate indigenous grass species;</li> <li>During the construction phase workers must be limited to areas under construction and access to the undeveloped areas must be strictly controlled;</li> <li>Rehabilitated areas must be monitored to ensure the establishment of re-vegetated areas.</li> <li>No open fires are permitted within naturally vegetated areas.</li> <li>Formalise access roads and make use of existing roads and tracks where feasible, rather than creating</li> </ul>				



Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p>new routes through naturally vegetated areas.</p> <ul style="list-style-type: none"> <li>• Retain vegetation and soil in position for as long as possible in that area (DWAF, 2005).</li> <li>• No bush clearing is to be undertaken without the knowledge of the property owner. It is recommended that the owner is informed of the basic construction process during initial interaction so that they are aware of the vegetation clearing that will occur.</li> <li>• Only manual removal of weeds will be permitted on site. Chemical and mechanical (e.g. TLB, bulldozer) control is not allowed on site.</li> <li>• Implement an alien invasive plant monitoring and management plan whereby the spread of alien and invasive plant species into the areas disturbed by the construction of the substation are regularly</li> </ul>				

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			removed and re-infestation monitored.				

### 11.9 PROTECTION OF FAUNA AND AVIFAUNA

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>• Damage to habitat</li> <li>• Negative impact on bird due to electrocution and faulting</li> <li>• Negative impact on animal life.</li> </ul>	<ul style="list-style-type: none"> <li>• To conserve animal life.</li> <li>• To ensure that impact on natural vegetation is kept to the minimum in order to conserve suitable habitats as much as possible.</li> </ul>	<ul style="list-style-type: none"> <li>• NEMBA</li> </ul>	<p>Considering the loss of natural habitat in the area and the fragmentation of the remaining areas the following measures must be implemented:</p> <ul style="list-style-type: none"> <li>• Avoid unnecessary disturbance of faunal habitats.</li> <li>• Any bird nests that are found must be left intact/undisturbed.</li> <li>• The movement of vehicles and heavy machinery around sensitive fauna habitats (wetland crossings must be limited.</li> <li>• Under no circumstances shall any animals (livestock or game) be</li> </ul>	<ul style="list-style-type: none"> <li>• No reported faunal injuries</li> <li>• No complaints from landowners</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Complaints register that records complaints from landowners</li> <li>• Daily inspection</li> </ul>	<ul style="list-style-type: none"> <li>• ECO</li> <li>• CEO</li> </ul>	On-going during the construction phase.

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	<ul style="list-style-type: none"> <li>To prevent degradation of suitable sensitive fauna habitats.</li> <li>To prevent contamination of water within the nearby watercourse thereby preserving several amphibian species.</li> <li>To ensure that impact on sensitive fauna species is kept to a minimum</li> </ul>		<ul style="list-style-type: none"> <li>hunted, handled, killed or be interfered with by the construction team.</li> <li>No construction personnel are allowed to bring any animals on site.</li> <li>The Contractor shall keep the site clean and tidy from waste material that can attract animals.</li> <li>Fauna rescue and relocation programme must be implemented.</li> <li>Any open excavations must be barricaded and regularly inspected to prevent fauna from falling in.</li> <li>Records of any injury or deaths of fauna within the construction servitude must be kept by the CEO and ECO.</li> <li>Construction must be restricted to daylight hours to prevent any disturbance such as floodlights.</li> <li>Avoid construction in sensitive</li> </ul>				

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	<ul style="list-style-type: none"> <li>To ensure that ecological linkages are maintained.</li> <li>To prevent injury or death of fauna species as a result of falling into open excavations</li> <li>To prevent electrical faulting</li> </ul>		<ul style="list-style-type: none"> <li>vegetation types and wetland areas.</li> <li>Construction activities should be restricted to the immediate footprint of the infrastructure to avoid any additional disturbance impacts on bird species residing in the broader area.</li> <li>Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of Red Data species.</li> <li>Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum.</li> <li>Measures to control noise should be applied according to current best practice in the industry.</li> <li>While it is not illegal to remove an unoccupied nest that is posing a quality of supply risk, the removal</li> </ul>				

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			of nests that contain eggs or chicks will require a permit to do so. Nest management strategies to be identified and implemented reactively, if required.				

#### 11.10 HERITAGE AND/OR ARCHAEOLOGICAL SITES

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>• Destruction of sites of archaeological and heritage significance.</li> <li>• Loss of historic cultural landscape.</li> <li>• Loss of intangible heritage value due to change in</li> </ul>	<ul style="list-style-type: none"> <li>• To preserve any heritage, cultural or archaeological sites that might be encountered during the construction phase.</li> <li>• Protection of known sites against destruction, vandalism</li> </ul>	<ul style="list-style-type: none"> <li>• NHRA</li> </ul>	<p>No obvious sites of heritage significance were noted on site, however in the event of chance finds, the following mitigations must be implemented:</p> <ul style="list-style-type: none"> <li>• To protect graves, an educational programme to construction workers is essential to avoid accidental damage.</li> <li>• Should isolated stone tools be encountered, no stone robbing or</li> </ul>	<ul style="list-style-type: none"> <li>• Detailed record of chance finds.</li> <li>• No destruction of or damage to known archaeological sites</li> <li>• Management of existing sites and new discoveries in accordance with the recommendat</li> </ul>	<ul style="list-style-type: none"> <li>• Intermittent observation.</li> </ul>	<ul style="list-style-type: none"> <li>• ECO &amp;</li> <li>• Contractor</li> <li>• CEO</li> <li>• Archaeologist</li> </ul>	On-going during all excavations

<p>land use.</p>	<p>and theft.</p> <ul style="list-style-type: none"> <li>• Preservation and appropriate management of any new archaeological sites should this be discovered during construction.</li> </ul>		<p>removal of any material is allowed.</p> <ul style="list-style-type: none"> <li>• There are no burial sites or graves identified on site, however, should graves and burial sites be discovered during construction activities, all activities should cease and the site must be barricaded. Further, SAHRA / MPHRA or a professional archaeologist must be informed.</li> <li>• Should any unmarked burials exposed during construction, affected families must be consulted, relevant rescue / relocation permits must be obtained from SAHRA/MPHRA before any grave relocation can take place. Furthermore, a professional archaeologist must be retained to oversee the relocation process in accordance with the National Heritage Resources Act, 1999 (25) of 1999;</li> <li>• Should archaeological materials (e.g. fossils, bones, artefacts etc.)</li> </ul>	<p>ions of the Archaeologist</p> <ul style="list-style-type: none"> <li>• No litigation due to destruction of sites.</li> </ul>			
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			<p>or human burials remains be exposed during construction, work should cease on the affected area and the discovery must be reported to the heritage authorities immediately. The Contractor shall not recommence working in that area until written permission has been received from the SAHRA.</p> <ul style="list-style-type: none"> <li>Where burial sites are accidentally disturbed during construction, the affected area should be demarcated as no go areas.</li> </ul>				
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#### 11.11 SERVICING AND RE-FUELLING OF CONSTRUCTION EQUIPMENT

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Impact on soil and water resources due to accidental spillages.</li> </ul>	<ul style="list-style-type: none"> <li>To conserve soils, surface and ground water.</li> <li>To prevent spillages of hazardous substances</li> </ul>	<ul style="list-style-type: none"> <li>NEMWA</li> <li>NWA</li> <li>OHSA</li> </ul>	<ul style="list-style-type: none"> <li>All maintenance and repair work will be carried out within an area designated for this purpose, equipped with necessary pollution containment measures.</li> <li>Refuelling, greasing or oiling of vehicle and construction machinery</li> </ul>	<ul style="list-style-type: none"> <li>No evidence of hazardous substances polluting the site.</li> </ul>	<ul style="list-style-type: none"> <li>On-going monitoring with regular inspections; and</li> <li>Service Records.</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> <li>Contractor</li> <li>CEO</li> </ul>	On-going during the construction phase

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p>must be done on a drip tray or bunded surface.</p> <ul style="list-style-type: none"> <li>• Drip trays must be placed under stationary construction vehicles and machinery at all times.</li> <li>• Construction vehicles are to be maintained in an acceptable state of repair. No vehicles or equipment with leaks or causing spills will be permitted on site.</li> <li>• Fuel must be stored at a central depot that must be located on an impermeable surface (concrete slab) and be contained within a bund capable of containing at least 110% of the total volume in the containers.</li> <li>• Temporary fuel storage tanks and transfer areas also need to be located on an adequately bunded surface to contain accidental spillages.</li> </ul>				



## 11.12 WASTE MANAGEMENT

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Visual Impact</li> <li>Water resources</li> <li>Land pollution</li> </ul>	<ul style="list-style-type: none"> <li>To ensure the efficient management of waste on site</li> <li>To ensure minimal impact on the surrounding environment</li> <li>Minimise waste material being strewn in the environment</li> </ul>	<ul style="list-style-type: none"> <li>NEMWA</li> </ul>	<p><b>11.12.1 SOLID WASTE MANAGEMENT</b></p> <ul style="list-style-type: none"> <li>Waste must be separated at source (e.g. containers for glass, paper, metals, plastic, organic waste and hazardous waste).</li> <li>An adequate number of scavenger proof refuse bins must be provided at the construction site and must be clearly labelled (general or hazardous) according to waste streams.</li> <li>All waste must be transported in an appropriate manner (e.g. plastic rubbish bags) and disposed of at a licensed waste disposal facility. Proof of safe disposal must be kept on site.</li> <li>No waste including construction rubble may be disposed of by</li> </ul>	<ul style="list-style-type: none"> <li>Presence of proper storage facilities that are properly labelled.</li> <li>Post-construction work areas are clear of all waste materials.</li> </ul>	<ul style="list-style-type: none"> <li>Intermittent Observation</li> <li>Waste Disposal Records</li> </ul>	<ul style="list-style-type: none"> <li>ECO &amp;</li> <li>Contractor</li> <li>CEO</li> </ul>	Daily

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p>burning or burying.</p> <ul style="list-style-type: none"> <li>Waste bins must be emptied regularly (minimum weekly) such that they do not overflow.</li> <li>The Contractor shall maintain 'good housekeeping' practices and ensure that all work sites and the construction camp is kept tidy and litter free.</li> </ul> <p><b>11.12.2 LIQUID WASTE MANAGEMENT</b></p> <ul style="list-style-type: none"> <li>An adequate number of suitable containers with lids must be provided at the construction site.</li> <li>The Contractor will ensure that waste water is discharged in the drums provided.</li> <li>All waste must be transported in an appropriate manner and disposed of at a licensed waste disposal site.</li> </ul>				

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p><b>11.12.3 HAZARDOUS WASTE</b></p> <ul style="list-style-type: none"> <li>• The Contractor must comply with all national, regional and local legislation with regard to the storage, transport, use and disposal of petroleum, chemical, harmful and hazardous substances and materials.</li> <li>• The Contractor will furthermore be responsible for the training and education of all personnel on site who will be handling the material about its proper use, handling and disposing.</li> <li>• The Contractor will be responsible for establishing an emergency procedure for dealing with spills or toxic substances.</li> <li>• Storage of all hazardous material is to be safe, tamper proof and under strict control.</li> <li>• Petroleum, chemical, harmful</li> </ul>				

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p>and hazardous waste throughout the site must be stored in appropriate, well maintained containers.</p> <ul style="list-style-type: none"> <li>Exercise extreme care with the handling of diesel and other toxic solvents to ensure that spillage is minimised.</li> <li>Any accidental chemical / fuel spills have to be corrected immediately.</li> </ul>				

### 11.13 SURFACE AND GROUND WATER MANAGEMENT

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Possible contamination of water resources.</li> </ul>	<ul style="list-style-type: none"> <li>To conserve all-natural water resources</li> <li>To avoid illegal diversion and destruction of water resources.</li> </ul>	NWA	<ul style="list-style-type: none"> <li>The Contractor must take reasonable precautions to prevent the pollution of ground and surface water resources as a result of construction activities.</li> <li>No natural watercourse is to be used for the cleaning of</li> </ul>	<ul style="list-style-type: none"> <li>Unpolluted watercourses</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Design Plans</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>ECO</li> <li>CEO</li> </ul>	Continuous through the construction phase.

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	<ul style="list-style-type: none"> <li>To ensure proper management of storm water run-off that causes erosion and siltation/sedimentation</li> <li>To ensure that the rivers and streams are protected and incur minimal negative impact from the development.</li> <li>To ensure compliance with the requirements of the Act.</li> </ul>		<p>tools. This includes for purposes of bathing, or washing of clothes etc.</p> <ul style="list-style-type: none"> <li>No spills may be hosed into the surrounding natural environment.</li> <li>All soil contaminated must be excavated to the depth of contaminant penetration, placed in suitable drums/containers and removed to a hazardous waste facility.</li> <li>No extraction of water from any natural resources without the relevant authorisation.</li> <li>Erosion control measure must be put in place to control storm water runoff.</li> <li>Storm water management measures must be as per the Method Statement prepared by the Contractor for ECO approval.</li> </ul>				

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<ul style="list-style-type: none"> <li>Erosion control on all access roads must be undertaken.</li> <li>Minimise the extent of damage to flood plains that is necessary to complete the works, and will not pollute any water course as a result of construction.</li> </ul>				

#### 11.14 SENSITIVE AREAS (WATER COURSES AND BUFFERS)

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Changing the quantity and fluctuation properties of the watercourse.</li> <li>Changing the amount of sediment entering water resource and</li> </ul>	<ul style="list-style-type: none"> <li>To preserve and conserve the sensitive environment.</li> </ul>	NWA	<p>No streams or wetlands will be crossed by the power lines; however, there is an artificial wetland approximately 135m and a non-perennial river 220m to the south of the proposed study area respectively.</p> <ul style="list-style-type: none"> <li>Vehicular access through watercourses must be prohibited (unless a GA/WUL is in place). If inevitable access must be managed and limited to only one access.</li> </ul>	<ul style="list-style-type: none"> <li>Undisturbed sensitive environments and/or properly rehabilitated.</li> <li>Compliance with the WUL conditions</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>WUL</li> </ul>	<ul style="list-style-type: none"> <li>CEO</li> <li>ECO</li> <li>Contractor</li> </ul>	Throughout the construction and post construction to ensure proper rehabilitation.

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<p>associated change in turbidity (increasing or decreasing the amount)</p> <ul style="list-style-type: none"> <li>Alteration of water quality toxic contaminants (including toxic metal ions (e.g. copper, lead, zinc) and hydrocarbons.</li> <li>Changing the physical structure within a water resource.</li> </ul>			<ul style="list-style-type: none"> <li>Cordon-off areas that are under rehabilitation as no-go areas. If necessary, these areas should be cordoned off to prevent vehicular, pedestrian and livestock access.</li> <li>Runoff from roads must be managed to avoid erosion and pollution problems.</li> <li>Demarcate the watercourses and buffer zones to limit disturbance and clearly mark these areas as no-go areas.</li> <li>No vehicles must be allowed to drive through and within watercourses.</li> <li>Erosion control measures must be implemented in areas sensitive to erosion, particularly in areas prone to wind erosion and where erosion has already occurred such as edges of slopes, exposed soil etc.</li> <li>Recommendation from Department of Water and Sanitation as part of the licencing process must be taken into consideration throughout the</li> </ul>				

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			construction phase.				

### 11.15 HAZARDOUS MATERIALS

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Impact on soils and water resources</li> </ul>	<ul style="list-style-type: none"> <li>To ensure safe and proper handling of hazardous material</li> </ul>	<ul style="list-style-type: none"> <li>HSA</li> </ul>	<ul style="list-style-type: none"> <li>The Contractor must comply with all National, Regional and Local legislation with regard to the storage, transport, use and disposal of petroleum, chemical, harmful and hazardous substances and materials.</li> <li>The CEO will furthermore be responsible for the training and education of all personnel on site who will be handling the material about its proper use, handling and disposal.</li> <li>Exercise extreme care with the handling of diesel and other toxic solvents to ensure that spillage is avoided.</li> <li>Any accidental chemical / fuel spills</li> </ul>	<ul style="list-style-type: none"> <li>No incidents reported</li> </ul>	<ul style="list-style-type: none"> <li>Hazardous material data sheet</li> <li>Incident reports</li> <li>Observation of spillages and leakages</li> </ul>	<ul style="list-style-type: none"> <li>ECO &amp;</li> <li>Contractor</li> <li>CEO</li> </ul>	<ul style="list-style-type: none"> <li>Continuous throughout the construction phase</li> </ul>



Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			must be remediated immediately.				

### 11.16 OIL SPILL MANAGEMENT

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Impact on soils and water resources</li> </ul>	<ul style="list-style-type: none"> <li>To avoid ground and surface water contamination</li> <li>To ensure proper and safe handling of oil spillages.</li> </ul>	<ul style="list-style-type: none"> <li>HSA</li> </ul>	<ul style="list-style-type: none"> <li>The Contractor must prevent potential hydrocarbon spills during construction.</li> <li>Hydrocarbon must be stored in properly contained areas so as to minimise accidental spillage.</li> <li>All spills must be reported to the ECO within 24 hours of occurrence and DLM procedures must be followed thereafter.</li> <li>The Contractor must be in possession of a mobile oil spill kit at all times.</li> <li>The oil spill clean-up and rehabilitation standards must be implemented.</li> </ul>	<ul style="list-style-type: none"> <li>No incident reported</li> <li>Proper use of drip trays</li> <li>Presence of oil spill kit</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Incident report</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> <li>Contractor</li> <li>CEO</li> </ul>	On-going during the construction phase.

### 11.17 STORM WATER MANAGEMENT

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Possible negative impact on water resources</li> </ul>	<ul style="list-style-type: none"> <li>To reduce the potential impact from runoff on sensitive areas.</li> </ul>	<ul style="list-style-type: none"> <li>NWA</li> </ul>	<ul style="list-style-type: none"> <li>The Contractor must ensure that rainwater pollutants from construction activities does not run-off into natural areas and thus result in a pollution threat.</li> <li>Storm water shall be diverted from the construction works.</li> <li>Storm water management measures must be as per the Storm Water Management Method Statement prepared by the Contractor for ECO approval.</li> <li>Increased runoff due to vegetation clearance and/or soil compaction must be managed and steps must be taken to ensure that storm water does not lead to excessive levels of silt entering the watercourses.</li> <li>Necessary storm water control mechanisms shall be employed to ensure the sustainability of all the structures.</li> </ul>	<ul style="list-style-type: none"> <li>No evidence of erosion</li> <li>No evidence of increased siltation</li> <li>No evidence of contaminated water courses.</li> </ul>	<ul style="list-style-type: none"> <li>Site Plan</li> <li>Observation</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> <li>Contractor</li> <li>CEO</li> </ul>	Continuous during the construction

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<ul style="list-style-type: none"> <li>Effort shall be made to ensure that storm water leaving the construction site is not contaminated by any substance, whether solid, liquid or gas.</li> </ul>				

### 11.18 FIRE

Possible Impact	Objective	Applicable Legislation /Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Destruction of property</li> <li>Loss of life</li> <li>Destruction of crops and livestock</li> </ul>	<ul style="list-style-type: none"> <li>To prevent open fires.</li> <li>To ensure that the workforce is aware of emergency procedures should an incident occur</li> </ul>	<ul style="list-style-type: none"> <li>NEMA</li> </ul>	<ul style="list-style-type: none"> <li>A fire Management Method Statement must be put in place by the Contractor.</li> <li>The Method Statement must be approved by the ECO and DLM Representatives.</li> <li>All the necessary precautions must be implemented to ensure that fires are not started as a result of activities on site.</li> <li>Fuels or chemicals must be stored at the designated storage area.</li> <li>Gas and liquid fuels must not be stored in the same storage area.</li> <li>All fire control mechanisms (fire fighting</li> </ul>	<ul style="list-style-type: none"> <li>No reported fire incidents</li> <li>No loss of life</li> <li>No traces of cigarettes butts outside the designated smoking area.</li> </ul>	<ul style="list-style-type: none"> <li>Fire Management Plan</li> <li>Daily checks</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> <li>Contractor</li> <li>CEO</li> </ul>	On-going during the construction phase

Possible Impact	Objective	Applicable Legislation /Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p>equipment) will be made available and accessible at all times and routinely inspected.</p> <ul style="list-style-type: none"> <li>No open fires for heating or cooking will be permitted on site, unless agreed and then only on designated areas.</li> <li>Designated smoking areas must be provided, with special bins for discarding of cigarette stump.</li> <li>Fire must be reported immediately.</li> </ul>				

### 11.19 AIR POLLUTION

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Dust nuisance from excavations, vegetation clearing and dirt roads.</li> <li>Exhaust fumes from construction vehicles.</li> </ul>	<ul style="list-style-type: none"> <li>To ensure proper mitigation of air pollution</li> <li>To avoid dust nuisance from</li> </ul>	<ul style="list-style-type: none"> <li>NEMAQA</li> </ul>	<p>The potential air pollutants would be dust emanating from excavation activities and access roads; emissions or exhaust fumes from faulty plant or equipment. The following measures must be put in place:</p> <ul style="list-style-type: none"> <li>Appropriate dust suppression measures or temporary stabilising mechanisms (e.g. adherence to speed limit, chemical</li> </ul>	<ul style="list-style-type: none"> <li>No complaints from surrounding land owners recorded.</li> <li>No evidence of dust pollution plumes on site.</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Complaints register</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> <li>Contractor</li> <li>CEO</li> </ul>	On-going throughout the construction phase

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	excavation activities and vehicles on dirt roads		<p>soil binders, straw, brush packs chipping) must be put in place throughout construction, particularly during prolonged periods of dry weather.</p> <ul style="list-style-type: none"> <li>Removal of vegetation must be avoided until such time as soil stripping is required.</li> <li>A maximum speed of 40km/hr on the access road must be adhered to in order to minimise or avoid dust pollution.</li> <li>Construction vehicles and equipment must be in good working order and serviced regularly.</li> </ul>				

## 11.20 NOISE

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Noise during excavation/ drilling of foundations and</li> </ul>	<ul style="list-style-type: none"> <li>To ensure minimal noise disturbance</li> </ul>	<ul style="list-style-type: none"> <li>ECA</li> </ul>	<ul style="list-style-type: none"> <li>Machinery and vehicles are to be maintained in good working order.</li> <li>Offending machinery and vehicles will be banned from use on site until they have</li> </ul>	<ul style="list-style-type: none"> <li>No complaints from surrounding land owners recorded.</li> </ul>	<ul style="list-style-type: none"> <li>Noise monitoring</li> <li>A register of complaints to be kept on site at all times and</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>ECO</li> <li>CEO</li> </ul>	On-going during the construction phase

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
associated activities	<ul style="list-style-type: none"> <li>To ensure proper mitigation of noise.</li> <li>To avoid noise nuisance from operating construction equipment.</li> </ul>		<p>been repaired.</p> <ul style="list-style-type: none"> <li>The project team must endeavour to keep noise generating activities associated with construction to a minimum and within working hours.</li> <li>Any complaints pertaining to noise must be recorded and reported to the ECO and addressed accordingly.</li> <li>Labourers to be provided with hearing protection as and when required.</li> </ul>		kept up to date.		

### 11.21 VISUAL

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Loss of sense of place.</li> </ul>	<ul style="list-style-type: none"> <li>To ensure proper mitigation of potential visual impacts.</li> <li>To maintain the site's</li> </ul>	<ul style="list-style-type: none"> <li>NEMA</li> </ul>	<p><b>11.21.1 ACCESS ROUTES</b></p> <ul style="list-style-type: none"> <li>Make use of existing access roads where possible;</li> <li>Where new access roads are required, the disturbance area should be kept to a minimum. A two-track dirt road will be</li> </ul>	<ul style="list-style-type: none"> <li>Clean and tidy site.</li> <li>No complaints from the landowners and affected</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Complaints register</li> </ul>	ECO & Contractor CEO	On-going during the construction phase.

Possible Impact	Objective	Applicable Legislation/P olicy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	aesthetics.		<p>the most preferred option;</p> <ul style="list-style-type: none"> <li>• Locate access routes so as to limit modification to the topography and to avoid the removal of established vegetation;</li> <li>• Maintain no or minimum cleared road verges;</li> <li>• Access routes should be located on the perimeter of disturbed areas such as cultivated/fallow lands as not to fragment intact vegetated areas; and</li> <li>• If it is necessary to clear vegetation for a road, avoid doing so in a continuous straight line. Alternatively, curve the road in order to reduce the visible extent of the cleared corridor.</li> </ul> <p><b>11.21.2 CLEARED SERVITUDES</b></p> <ul style="list-style-type: none"> <li>• Locate the alignment and the associated cleared servitude so as to avoid the removal of established vegetation; and</li> <li>• Avoid a continuous linear path of</li> </ul>	parties.			

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p>cleared vegetation that would strongly contrast with the surrounding landscape character. Feather the edges of the cleared corridor to avoid a clearly defined line through the landscape.</p> <p><b>11.21.3 CONSTRUCTION CAMPS AND LAY DOWN YARDS</b></p> <ul style="list-style-type: none"> <li>• If practically possible, locate construction camps in areas that are already disturbed or where it isn't necessary to remove established vegetation like for example naturally bare areas.</li> <li>• Utilise existing screening features such as dense vegetation stands or topographical features to place the construction camps and lay-down yards out of the view of sensitivity visual receptors.</li> <li>• Keep the construction sites and camps neat, clean and organised in order to</li> </ul>				



Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p>portray a tidy appearance.</p> <ul style="list-style-type: none"> <li>Screen the construction camp and lay-down yards by enclosing the entire area with a dark green or black shade cloth of no less than 2m height.</li> <li>Where possible, keep the construction camps away from existing residents and especially lodges and tourist venues.</li> </ul> <p><b>11.21.4 GENERAL</b></p> <ul style="list-style-type: none"> <li>Demarcate sensitive areas and no-go areas with danger tape to prevent disturbance during construction.</li> <li>Plan construction times in such a manner to have the least impact on surrounding properties.</li> <li>Keep disturbed areas to a minimum.</li> <li>No clearing of land to take place outside the demarcated footprints.</li> <li>The steel components should not be painted but be galvanised and allowed to oxidise naturally over time. The grey</li> </ul>				

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p>colour produced in this process will help to reduce the visual impact.</p> <ul style="list-style-type: none"> <li>• New road construction must be kept to a minimum. Utilise existing roads and tracks to the extent possible.</li> <li>• Reduce and control dust through the use of approved dust suspension techniques as and when required.</li> <li>• Construction to occur only during daytime. Should the DLM and ECO authorize night work, low flux and frequency lighting shall be used.</li> <li>• Rehabilitate all disturbed areas in accordance with the Method Statement.</li> <li>• Maintain access roads to prevent scouring and erosion, especially after rains.</li> <li>• Storage facilities and other temporary structures on site must be located such that they have as little visual impact on local residents as possible.</li> <li>• All temporary structures erected on site for the purposes of the project's</li> </ul>				

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p>construction phase will be removed from site upon completion of the project.</p> <ul style="list-style-type: none"> <li>Lighting will be sufficient to ensure security but will not constitute 'light pollution' to the surrounding areas.</li> <li>The site must be clean and tidy at all times.</li> </ul>				

#### 11.22 EXCAVATION, BACKFILLING AND TRENCHING

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Possible erosion</li> <li>Injury of animal life</li> </ul>	<ul style="list-style-type: none"> <li>To prevent erosion.</li> <li>To ensure safety for both human and animals.</li> </ul>	<ul style="list-style-type: none"> <li>OHSA</li> </ul>	<p>While working at areas prone to erosion the following must be adhered to:</p> <ul style="list-style-type: none"> <li>Excavations must not be left open for longer than 30 days.</li> <li>Excavations must be adequately barricaded/ fenced off at all times.</li> </ul>	<ul style="list-style-type: none"> <li>No incidence of animals trapped in trenches reported</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Incident report</li> </ul>	<ul style="list-style-type: none"> <li>Contractor /</li> <li>ECO</li> <li>CEO</li> </ul>	On-going excavations

#### 11.23 AGRICULTURAL ACTIVITIES

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Negative Impacts on agricultural activities.</li> </ul>	<ul style="list-style-type: none"> <li>To limit the impact on agricultural activities.</li> <li>To avoid undue loss of livestock and crops.</li> </ul>	CARA	<ul style="list-style-type: none"> <li>If vegetation cover is disturbed or removed especially on steeper slopes, then erosion can occur. Therefore, clear mitigation measures should be implemented, namely. <ul style="list-style-type: none"> <li>Roads should avoid steep slopes wherever possible;</li> <li>Where steep slopes are used, road stabilization measures (culverts, run-off trenches, banking of bends etc.) should be implemented; and</li> <li>Restrict areas cleared of vegetation to road surfaces only.</li> </ul> </li> <li>Special care should be given to areas with steeper topography.</li> <li>Maintain good relations with landowners.</li> <li>Consult landowners prior to any clearing activities.</li> </ul>	<ul style="list-style-type: none"> <li>No encroachment into agricultural crops</li> <li>No negative feedback from landowners</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Complaints register</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> <li>CEO</li> <li>Contractor</li> </ul>	During and after maintenance procedures

## 11.24 EROSION AND CONTROL

Possible Impact	Objective	Applicable Legislation /Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Impact on soils and habitats and sensitive environs.</li> </ul>	<ul style="list-style-type: none"> <li>To prevent erosion and sedimentation.</li> </ul>	<ul style="list-style-type: none"> <li>NWA</li> </ul>	<p>To prevent any form of erosion the following must be adhered to:</p> <ul style="list-style-type: none"> <li>During construction, the Contractor will protect areas susceptible to erosion by installing necessary temporary and / or permanent drainage system and by taking suitable measures to prevent surface water concentration into nearby roadways.</li> <li>Prior to construction, all topsoil must be stripped and stockpiled separately from subsoil and rocky material. Soil must be stripped in a phased manner so as to retain vegetation cover for as long as possible.</li> <li>Stockpiled topsoil must not be compacted and must be replaced as the final soil layer.</li> <li>Stockpiled soil must be protected by erosion-control berms if exposed for a period of greater than 14 days during the</li> </ul>	<ul style="list-style-type: none"> <li>No visible signs of erosion.</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Complaints register</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>ECO</li> <li>CEO</li> </ul>	<p>On-going particularly during excavations</p>

Possible Impact	Objective	Applicable Legislation /Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p>wet/windy season.</p> <ul style="list-style-type: none"> <li>• Topsoil stockpiles must not be contaminated with oil, diesel, petrol, waste or any other foreign matter, which may inhibit the later growth of vegetation and micro-organisms in the soil.</li> <li>• Soil must not be stockpiled on drainage lines or near watercourses.</li> <li>• The timing of clearing and grubbing must be co-ordinated as much as possible to avoid prolonged exposure of soils to wind and water erosion.</li> <li>• If topsoil will be stockpiled for a longer period, it must be either vegetated with indigenous grasses or covered with a suitable material to prevent erosion and invasion by weeds.</li> <li>• To limit the introduction of alien species into the area, no soil may be imported onto site.</li> <li>• Where required, cut-off trenches can be installed to divert substantial run-off and prevent erosion as and when necessary.</li> </ul>				

Possible Impact	Objective	Applicable Legislation /Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<ul style="list-style-type: none"> <li>Where new roads are constructed, water diversion berms should be constructed to prevent erosion.</li> <li>Sensitive areas such as watercourses (wetlands) must be cordoned off to control vehicles and construction personnel access.</li> </ul>				

#### 11.25 USE OF CEMENT AND CONCRETE

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Soil, surface and ground water pollution.</li> </ul>	<ul style="list-style-type: none"> <li>To conserve soils, surface and groundwater.</li> <li>To minimise waste concrete from polluting the</li> </ul>	<ul style="list-style-type: none"> <li>NEMA</li> <li>NEMWA</li> <li>HSA</li> </ul>	<p>Cement and concrete are regarded as highly hazardous to the natural environment due to their high pH and the chemicals contained therein. To avoid ground pollution the following must be implemented:</p> <ul style="list-style-type: none"> <li>Pre-mix concrete shall be the preferred option where possible.</li> </ul> <p>If concrete mixing is undertaken on site, the following measures must be put in place:</p> <ul style="list-style-type: none"> <li>The batching / mixing area must be</li> </ul>	<ul style="list-style-type: none"> <li>Areas of construction are clear of all concrete residue/waste following construction.</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Site Plan</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>ECO</li> <li>CEO</li> </ul>	Throughout the construction phase

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	environment		<p>properly designated, indicated on the site plan and kept neat and tidy at all times.</p> <ul style="list-style-type: none"> <li>No batching / mixing activities will occur on a permeable surface.</li> <li>Used and empty cement bags shall be dipped and soaked in water for 24 hours where after it can be removed and disposed of as general waste.</li> <li>The visible remains of the batch plant and concrete, either solid, or from washing shall be physically removed and disposed of appropriately at a licensed landfill site if not reused.</li> </ul>				

## 11.26 SITE CLEAN-UP AND REHABILITATION

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Erosion</li> <li>Spread of alien invasive plant</li> </ul>	<ul style="list-style-type: none"> <li>Minimise damage to topsoil and environment at tower</li> </ul>	<ul style="list-style-type: none"> <li>NEMBA</li> <li>NEMA</li> </ul>	<ul style="list-style-type: none"> <li>The Contractor must ensure that all temporary structures, materials, waste and facilities used for construction activities are removed</li> </ul>	<ul style="list-style-type: none"> <li>No loss of topsoil due to construction activities</li> </ul>	<ul style="list-style-type: none"> <li>Rehabilitation Plan</li> <li>Observation</li> </ul>	ECO CEO Contractor	<p>On completion of construction</p> <p>Random surveys by</p>



Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
species	<p>positions</p> <ul style="list-style-type: none"> <li>• Successful rehabilitation of all damaged areas</li> <li>• Prevention of erosion.</li> <li>• To ensure that the site is fully rehabilitated to its original state.</li> <li>• To ensure that the site is clean and neat.</li> <li>• Minimize claims and litigation from landowners</li> </ul>		<p>upon completion of the project.</p> <ul style="list-style-type: none"> <li>• Fully rehabilitate (e.g. clear and clean area, rake, pack branches etc.) all disturbed areas and protect them from erosion.</li> <li>• All replaced equipment and excess gravel, stone, concrete, bricks, temporary fencing and the like shall be removed from the site upon completion of the work.</li> <li>• No discarded materials of any nature shall be buried on the site or on any other land within the site.</li> <li>• Re-seeding shall be done on disturbed areas as per the rehabilitation Method Statement and as directed by the CEO and ECO.</li> <li>• Slopes in excess of 2% must be contoured and slopes in excess of 12% must be terraced.</li> <li>• The Contractor shall dispose of all excess material from site at a registered disposal facility.</li> </ul>	<ul style="list-style-type: none"> <li>• No loss of topsoil due to construction activities</li> <li>• All disturbed areas successfully rehabilitated within three months of completion of the contract</li> <li>• No visible erosion scars three months after completion of the contract</li> <li>• No open fires shall be allowed on site under any</li> </ul>			landowner

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<ul style="list-style-type: none"> <li>Reusable material will be taken off site and reused elsewhere.</li> </ul>	<p>circumstance</p> <ul style="list-style-type: none"> <li>No evidence of rubble or litter left on site.</li> <li>Successful completion of the contract with all landowners signing the release form six months after completion of the project.</li> </ul>			

## 11.27 GEOLOGY AND TOPOGRAPHY

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Loss of aesthetic value</li> </ul>	<ul style="list-style-type: none"> <li>To conserve the natural</li> </ul>	NEMA	The proposed project will be on a relatively flat area, however, should	<ul style="list-style-type: none"> <li>No loss of life due to</li> </ul>	<ul style="list-style-type: none"> <li>Signed off foundations by engineers.</li> </ul>	<ul style="list-style-type: none"> <li>Engineers</li> <li>ECO</li> <li>CEO</li> </ul>	Throughout construction.

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Habitat destruction</li> <li>Geological fragmentation</li> </ul>	geology on site. <ul style="list-style-type: none"> <li>To ensure the structural integrity of pylons.</li> </ul>		blasting be required the following must be implemented: <ul style="list-style-type: none"> <li>Blasting Method Statement must be prepared, signed by the engineer and approved by the ECO.</li> <li>Blasting permit must be obtained from the relevant authority prior to blasting.</li> <li>Land owners must be notified prior to blasting.</li> <li>Construction team must be made aware of the planned blasting activities.</li> <li>Proper PPE must be worn at all times.</li> <li>Blasting activities must be supervised by qualified personnel.</li> </ul>	blasting activities. <ul style="list-style-type: none"> <li>Stable pylons</li> <li>Intact geological structure</li> </ul>	<ul style="list-style-type: none"> <li>Blasting Certificate</li> </ul>		

**11.28 MONITORING OF EMPR COMPLIANCE**

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
To implement an on-going	<ul style="list-style-type: none"> <li>The correct and successful implementation of</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> </ul>	<ul style="list-style-type: none"> <li>ECO &amp;</li> </ul>	On-going post

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
monitoring and performance audit programme.	<p>impact mitigation measures in order to reduce adverse impacts on environmental aspects need to be ensured by a proper monitoring program.</p> <ul style="list-style-type: none"> <li>Monitoring of the general implementation of/adherence to the EMPr shall be the responsibility of the ECO.</li> <li>Reporting on adherence/compliance to stipulations as communicated to Contractors, shall take place during scheduled site meetings.</li> <li>Regular site Meetings by the project team.</li> <li>Continuous induction of staff and visitors on the EMPr conditions and requirements.</li> <li>Put in place non-conformance, prevention and corrective procedures.</li> </ul>	<ul style="list-style-type: none"> <li>Checklist</li> <li>Daily Register</li> <li>Attendance Registers</li> <li>Photographic evidence</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>CEO</li> </ul>	rehabilitation.

#### 11.29 DOCUMENT CONTROL

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>To ensure compliance with the requirements of the</li> </ul>	<ul style="list-style-type: none"> <li>Copies of the EMPr and the EA will be made available on site at all times.</li> </ul>	<ul style="list-style-type: none"> <li>Availability of an Construction and Operation EMPr copy on</li> </ul>	<ul style="list-style-type: none"> <li>ECO &amp;</li> <li>Contractor</li> <li>CEO</li> </ul>	On-going during the construction phase.

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
regulatory authority <ul style="list-style-type: none"> <li>To assign roles and responsibilities to ensure compliance</li> <li>To implement and comply with the requirements of the EMPr.</li> </ul>	<ul style="list-style-type: none"> <li>The EMPr as well as the EA will be used for referral as the project progresses. The EA will also be presented on request to I&amp;APs and stakeholders who may visit the site.</li> <li>Monitoring and Audit Reports must be submitted to DEA as and when required.</li> </ul>	site <ul style="list-style-type: none"> <li>Report submission Transmittal</li> </ul>		

## 12 OPERATION MANAGEMENT PROGRAMME

This section provides the description of the possible impacts and its mitigation measures associated with the operational phase.

Possible Impact	Objectives	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Waste generation during the operation phase will have a negative impact on the</li> </ul>	<ul style="list-style-type: none"> <li>To prevent ecological damage.</li> <li>Minimise damage to the identified watercourses.</li> <li>Reduce the deaths of</li> </ul>	NEMA NWA NEMWA NEMBA OHSA	<b>12.1.1 Waste Management</b> <ul style="list-style-type: none"> <li>Disposal of waste must be in accordance with relevant legislative requirements.</li> </ul> <b>12.1.2 Health and Safety</b> <ul style="list-style-type: none"> <li>Safety and security issues must be addressed as a priority in</li> </ul>	No complaints from the land owners.	<ul style="list-style-type: none"> <li>Complaints register</li> <li>Observation</li> </ul>	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>SHEQ Officer</li> </ul>	Weekly

Possible Impact	Objectives	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
environment, if not controlled adequately.	birds caused by collision and electrocution. <ul style="list-style-type: none"> <li>To prevent littering on site by storing waste appropriately.</li> <li>Prevent loss of life of people and livestock due to electrocution.</li> </ul>		accordance with Eskom's policies.				

### 13 GENERIC CONDITIONS

In order to ensure compliance with DLM's environmental policy as well as environmental legislation requirements, the following generic conditions are applicable Site documentation/monitoring. The site documentation shall be used to keep records on site. All documents shall be kept on site and be available for monitoring and auditing purposes. Site inspections by an Environmental Audit Team may require access to this documentation for auditing purposes. The documentation shall be signed by all parties to ensure that such documents are legitimate. Regular monitoring of all site works by the ECO is imperative to ensure that all problems encountered are solved punctually and amicably. When the ECO is not available, the Contract Manager/Site Supervisor shall keep abreast of all works to ensure no problems arise.

Monthly reports shall be submitted to the appointed Land Development Environmental Advisor with all information relating to environmental matters. The following Key Performance Indicators must be reported on a monthly basis:

- Complaints received from Landowners and actions taken;
- Environmental incidents, such as oil spills, concrete spills, etc. and actions taken (litigation excluded);
- Incidents possibly leading to litigation and legal contraventions; and
- Environmental damage that needs rehabilitation measures to be taken.

The following documentation shall be kept on site:

- Access negotiations and physical access plan;
- Complaints register;
- Daily site dairy;
- Records of all remediation / rehabilitation activities;
- Copies of monthly reports;
- Tree removal permits and other permits;
- Copy of the EMPr; and
- Copy of EA.

### **13.1 AUDITS**

All audits shall be undertaken in accordance with the requirement of Appendix 7 of the EIA Regulations of December 2014 as amended. During the construction period at least Quarterly Environmental Audits shall be conducted by the ECO to determine compliance with the recommendations of the EMPr and conditions of the EA.

The appointed ECO, as well as the Contractors on site, are responsible for ensuring compliance with the EMPr. It is recommended that Quarterly EMPr compliance reports (audits) are compiled by the ECO and submitted to CEO for correction of non-compliance issues. It is the responsibility of the ECO to report any non-compliance, which is not correctly rectified to the DEA. Further an audit should be conducted by a qualified botanical or rehabilitation specialist once construction has been completed.

## 13.2 ACCESS TO DOCUMENTS

Interested and Affected Parties (Landowners) must be allowed access to the EMPr document should they so wish. They have the right to monitor specific aspects of the EMPr in conjunction with the ECO and Contractor in a reasonable and informal manner, without unreasonably disrupting construction activities.

## 13.3 SOCIO-CULTURAL ISSUES

- A plan of action must be drawn up in the case of an emergency (veld fire, damaged substation, vegetation problems etc.)
- Property owners or occupiers must be treated with respect and courtesy at all times;
- Removal of agricultural products is prohibited. Receipts must be obtained for any merchandise purchased or received from landowners;
- Vehicles must be driven carefully in hazardous road conditions (sharp bends, narrow roads, bad weather, children playing on or near the road, domestic animals on or near the road etc.). Vehicle movement must be kept to a minimum during rain to avoid damage to the access road;
- Environmental clauses (as referred to in this EMPr) must be included into contract documents for all Contractors;
- Graves, archaeological sites and sites of historical interest are to be treated with respect and protected.
- No firewood is to be collected except with the written consent of the landowner; and
- A register must be maintained of all complaints or queries received as well as action taken.

## 14 FAILURE TO COMPLY WITH THE ENVIRONMENTAL CONSIDERATIONS

The ECO will, acting reasonably, have the authority to order the Contractor to suspend part or all of the works if he causes unacceptable damage to the environment by not adhering to the specifications set out below. The suspension will be enforced until such time as the offending parties' actions, procedures and/or equipment are corrected and adequate mitigation measures implemented.



## **15 AMENDMENT OF CONSTRUCTION AND OPERATION EMPR**

Any issue that may arise during the construction or operational phase of the development and that is not provided for in this EMPr may be addressed as an addendum to this EMPr. An addendum will be submitted to the Client for approval prior to the implementation of the provisions contained and communicated to the Authorities.