HUMBA ENVIRONMENTAL CONSULTANCY

Environmental Management Programme Report - The proposed construction of the Ararat- Bafokeng 88kv Powerline within the Rustenburg Local Municipality, Northwest Province

DOCUMENT CONTROL

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ABBREVIATIONS

BA	Basic Assessment
BAR	Basic Assessment Report
BPDM	Bojanala Platinum District Municipality
CA	Competent Authority
EMPr	Environmental Management Programme
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
GDP	Gross Domestic Product
I&APs	Interested and Affected Party's
IDP	Integrated Development Plan
PPP	Public Participation Process

KEY DEFINITIONS

Auditing: A systematic process of objectively obtaining and evaluating evidence regarding the effectiveness and performance of the Environmental Management Programme.

Corrective Measures: A response required to eliminate the occurrence of a non-compliance with the requirements of the EMPr.

Environmental Impact Assessment (EIA): A systematic process of identifying, assessing and reporting environmental impacts associated with an activity.

Environmental Impact Report: A report describing the process of examining the environment effects of a development proposal, the expected impacts and the proposed mitigating measures.

Environmental Method Statement: A statement that indicates how compliance with environmental specifications will be achieved, providing a framework for the setting of objectives and targets.

Impact: A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.

Mitigation Measures: These are the management measures that are used to mitigate negative impacts or enhance positive impacts associated with a proposed project.

Non-conformance: Non-compliance is issued when a transgression of the underlying management measures outlined in this document, relating to the construction, operation or decommissioning of the power lines occurs. A Non-conformance report must be completed setting out corrective actions, responsibilities and timeframes.

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1. INTRODUCTION

Eskom Holdings SOC Limited (ESKOM) is mandated by the South African Government to ensure the provision of reliable and affordable power to South Africa. ESKOM currently generates approximately 95% of the electricity used in South Africa. Therefore, electricity must be generated in accordance with supply demand requirements. ESKOM's core business is the generation, transmission and distribution of electricity.

The reliable provision of electricity by ESKOM is critical for industrial development and related employment and sustainable development in South Africa. As electricity cannot be stored, power is generated and delivered over long distances at the very instant that it is required. In South Africa, thousands of kilometres of high voltage Transmission lines (i.e., 765 kV, 400 kV and 275 kV transmission lines) transmit this power to ESKOM's major substations. At these major substations, the voltage is downrated and distributed to smaller substations all over the country via Distribution lines (e.g., 132 kV, 88 kV and 66 kV power lines). Here the voltage is down-rated further for distribution to industry, businesses, farms and homes. In order to maintain a reliable power supply within the entire network, the voltages at all substations are required to be within certain desired limits.

Eskom's Bafokeng 7 substation currently has two (2) transformers that supply electricity to Impala platinum mine. Eskom proposes to add a 3rd transformer at Eskom Bafokeng 7 substation for Impala Platinum mine by reducing electricity load at Millennium Substation which feeds Millennium mine and increasing/taking it to Bafokeng 7 substation which will supply more electricity load for Impala Platinum mine.

The scope of work for this project entails then,

1. the installation of a new 40MVA 88/33kV transformer at Eskom Bafokeng 7 substation; and
2. the splitting of the 2xSycamore 88kV lines that are entering the Bafokeng 7 88/33kV substation and the 2xSycamore 88kV lines that are also leaving the Eskom Ararat Main Transmission Substation (MTS), so as to increase a load for Impala Platinum mine while maintaining a firm supply at Eskom's Millennium 88/33/6.6kV substation by shifting load from the Millennium point of supply to Eskom's Bafokeng 7 substation.

In addition, Eskom Bafokeng 7 substation supplies the local townships of Mogono and Ga-Luka. The Ararat MTS supplies local substations like Minpro, SA Chrome, Millennium, Impala Platinum, Phokeng, Wildeplats and Bafokeng 7. As such, some activities in Listing Notice 1 are triggered. In light of this, ESKOM has appointed Humba Environmental Consultancy (Humba) through Trans Africa Projects (TAP) to act as an

independent EAP and subsequently conduct all the activities related to formulating a Basic Assessment Report (BAR) and submit it to the Competent Authority (CA). The CA then uses the information in the BAR and associated appendices to decide whether the activity can be positively authorised (given the go-ahead) and what conditions are necessary to protect the socio-economic and natural environments, or if the proposed project will be too detrimental to the environment and must be stopped from being implemented.

This EMPr is designed to assist in this objective and to ensure that proper planning is undertaken. This EMPr has also been compiled to provide recommendations and guidelines to which compliance monitoring can be done during the construction of the powerline as well as to ensure that all relevant factors are considered to ensure for environmentally responsible development. The EMPr will be strictly implemented during the construction of the 88Kv powerline and will be reviewed regularly during the lifespan of the project until decommissioning for updating where necessary. It is important to note that this EMPr is a "living" document and must be reviewed on a regular basis.

2. LOCALITY OF THE PROJECT

The proposed project will be in the Rustenburg Local Municipality (RLM) under the magisterial municipal district of Bojanala Platinum (BPDM). Ararat MTS is approximately 4km due north-east of Phokeng town, capital of the Royal Bafokeng Nation. Bafokeng 7 substation is located between the Ga-Luka and Magono townships, Rustenburg. Ararat MTS is approximately 7.5km due south of Bafokeng 7 substation (see Figure 1 below)

Table 1: Project Location Details

Property description/ Physical address and Farm Names	
Province	Northwest Province
District Municipality	Bojanala Platinum District Municipality
Local Municipality	Rustenburg Local Municipality
Farm Names	Doornspruit 106 JQ and Kookfontein 265 JQ

The proposed line route at Ararat Option A is 244.32m whilst at Ararat Option B, the length is 574.83m. The proposed Bafokeng 7 Line is 394.76m.

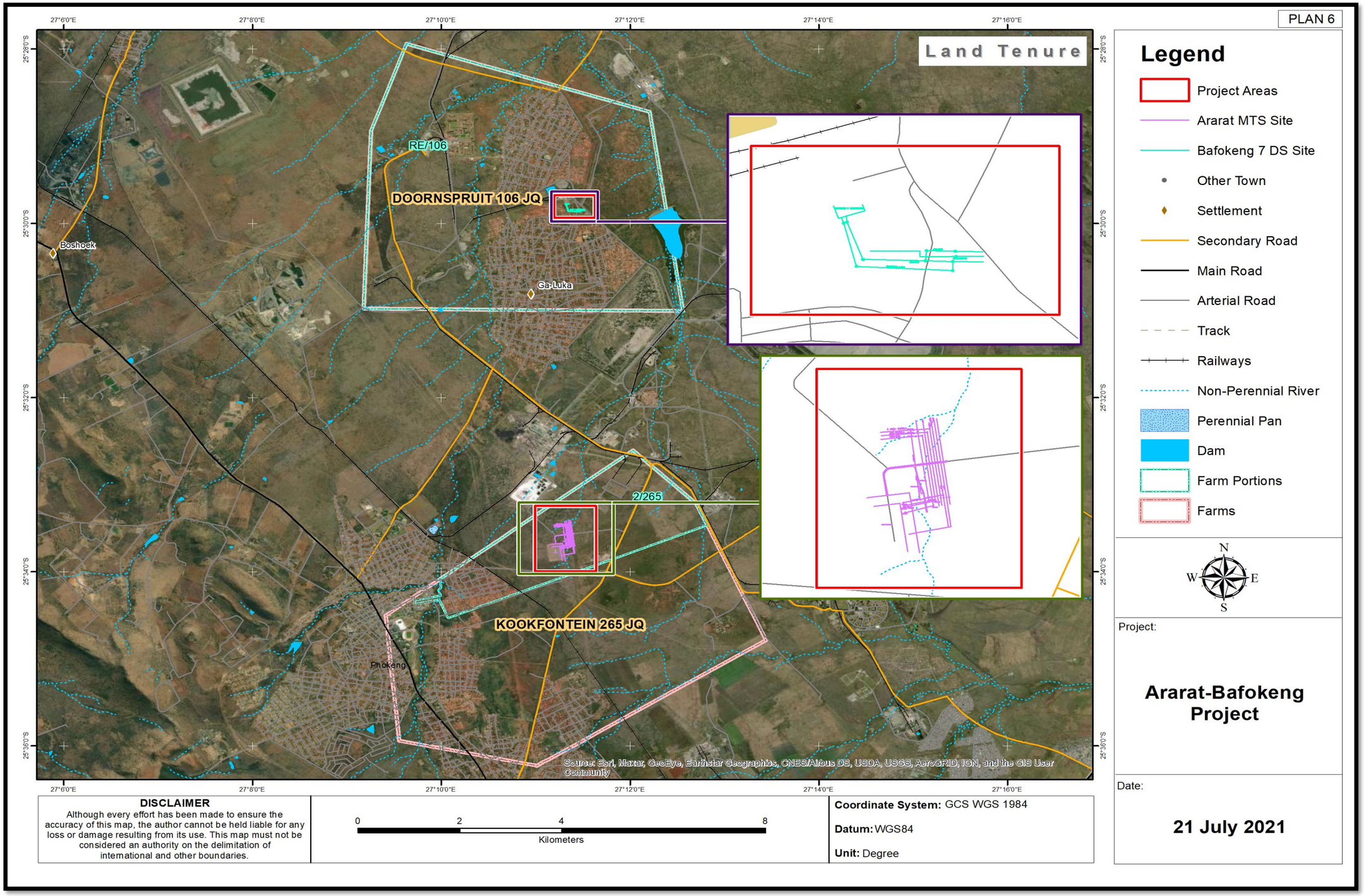


Figure 1: Figure showing the relative locations of Ararat MTS and the Bafokeng 7 Substation

3. ACTIVITIES OF THE PROJECT

3.1. Activity to be undertaken

ESKOM is proposing to build two separate sections of 88kV distribution powerline by splitting the 2xSycamore 88kV lines entering Bafokeng 88/33kV substation and leaving Ararat MTS.

- **Line clearances**

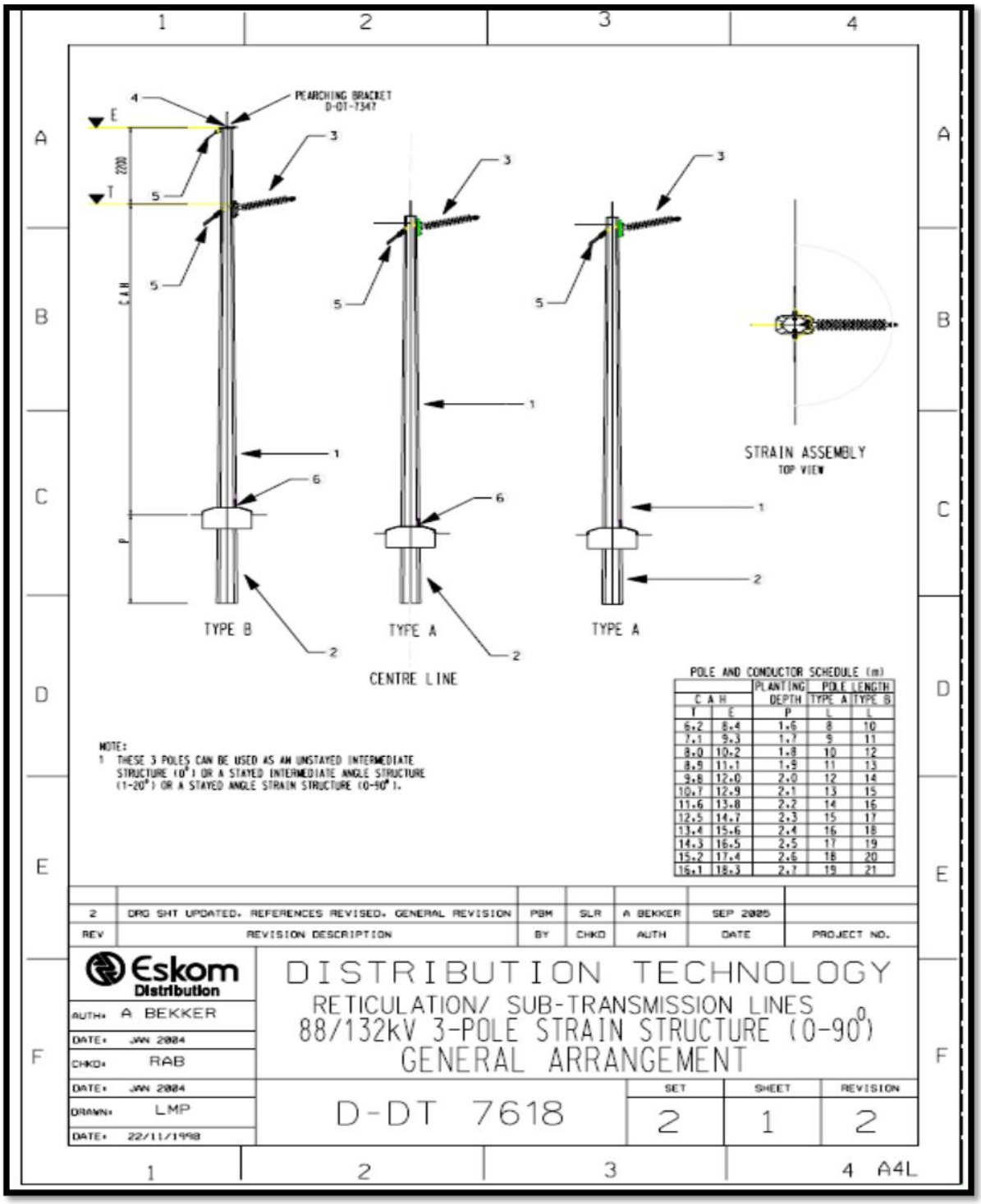
Low voltage power lines require a fair amount of clearance area for safety precautions. The Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) provides for statutory clearances.

- **Servitude requirements for the proposed power line**

The proposed 88kV power line will require specialists to study a corridor 100m wide in order to accommodate a servitude width of 31m (15.5m either side of the centre line of the power line). Any extra area required outside the servitude shall be negotiated with the relevant land occupiers and approved by ESKOM. All areas marked as no-go areas, identified by means of the environmental assessment process, located inside the servitude shall be treated with the utmost care and responsibility. If any environmental and/or socio-economic concerns within the servitude width are found within the proposed power line, the 50m width shall provide ESKOM with ample wiggle room to avoid any environmental and/or socio-economic concerns. The ESKOM Standard and specifications for vegetation clearance and invasive alien plant management for new power line construction specifications have been incorporated into the Environmental Management Programme (EMPr), which will guide the construction, operational and maintenance phases of the project.

- **Towers installation**

The proposed tower technology to be employed will be the D-DT 7618 (Strain) which is a 3-pole strain structure (see Figure 2 below) and the D-DT 7645 (Strain) which is a guyed strain structure (see Figure 3 below).



C	A	H	PLANTING DEPTH	POLE LENGTH TYPE A	POLE LENGTH TYPE B
T	E		P	L	L
6.2	8.4		1.6	8	10
7.1	9.3		1.7	9	11
8.0	10.2		1.8	10	12
8.9	11.1		1.9	11	13
9.8	12.0		2.0	12	14
10.7	12.9		2.1	13	15
11.6	13.8		2.2	14	16
12.5	14.7		2.3	15	17
13.4	15.6		2.4	16	18
14.3	16.5		2.5	17	19
15.2	17.4		2.6	18	20
16.1	18.3		2.7	19	21

REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.
2	DRG SHT UPDATED. REFERENCES REVISED. GENERAL REVISION	PBM	SLR	A BEKKER	SEP 2005	

AUTH:	A BEKKER
DATE:	JAN 2004
CHKD:	RAB
DATE:	JAN 2004
DRAWN:	LMP
DATE:	22/11/1998

SET	SHEET	REVISION
2	1	2

Figure 2: D-DT 7618 type tower technology

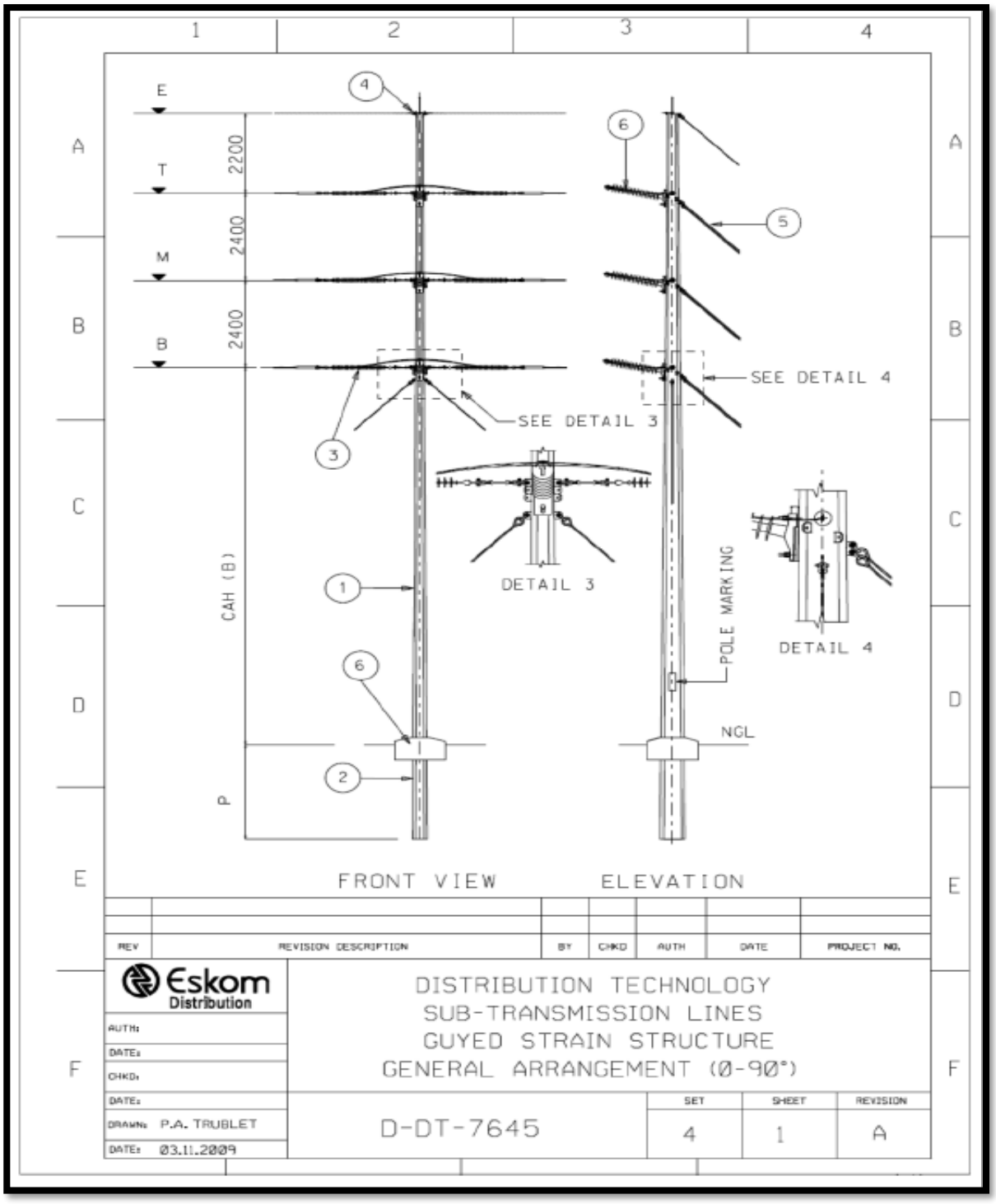


Figure 3: D-DT 7645 (Strain) type tower technology

- **Road Access for Construction and Maintenance of the 88kV power lines**

Road access will be required as part of the servitude along the distribution line for easy access during the construction, and maintenance of the distribution line. There is existing access at the Ararat MTS as shown by Figure 4 below. Access will need to be negotiated at the Bafokeng 7 substation site.

Figure 4: Access road identified at Ararat MTS

- **Specialist studies**

Several specialist studies were conducted to provide more detailed information on the environment aspects that may be affected by the proposed project. These studies addressed Ecological (Flora, Fauna and Avi-fauna), Watercourse (Hydrology), Palaeontology and Heritage aspects. The specialist reports are attached as an appendix to this BAR.

- **Construction Site Camps**

The contactor appointed for the construction of the power line may set up site camps. Alternatively, the contractor may however prefer to use a fully serviced site in another location.

3.2. Listed Activities

The proposed construction of the 88kV Ararat-Bafokeng distribution power lines triggers listed activities in terms of the National Environmental Management Act (NEMA), 1998 (Act No 107 of 1998). The activities triggered by the proposed 88kV distribution power line are listed in Table 2 below. The table

gives the Government Notice Number under which the activity is triggered, activity number, activity description in terms of NEMA, and the description of the activity itself in relation to that of the description of the activity being triggered.

Table 2: Listed Activities Triggered

Listed activity as described in R327	Description of project activity
No. 11(i): The development of facilities or infrastructure for the transmission and distribution of electricity outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts	The proposed project entails the development of facilities and infrastructure for the distribution of electricity. The proposed line has an 88kV capacity.

4. BACKGROUND INFORMATION

It is widely accepted that any development can pose various risks to the environment as well as the inhabitants in the surrounding areas. These possible risks must be taken into account during both the construction and operational phase of the development. The purpose of this document is to provide management responses that will ensure impacts resulting from the development are minimised. This EMPr is, therefore, a stand-alone document, which must be used onsite during each phase of the development (planning (pre-construction), construction, operation and decommission).

This document is flexible and will allow the contractor and ESKOM to conform to the management commitments provided in this document. The management commitments will ensure that the anticipated risks on the environment will be minimised. The responsibility to undertake the requirements set out in the EMPr rests with ESKOM, the main contractors and subcontractors. Any party responsible for transgression of the underlying management measures outlined in this document, will be held liable for non-compliances and will be remedied accordingly.

The process that was followed in compiling the EMPr is in compliance with Section 19 (4) of Chapter 4 of the National Environmental Management Act (Act 107 of 1998) of the new Environmental Impact Assessment Regulation, promulgated on the 07th of April 2017. The purpose of this EMPr is to formulate mitigation measures that are legally binding to all developers, contractors and environmental personnel during the construction phase as well as measures that must be implemented during the operational phase.

4.1 APPLICABLE DOCUMENTATION:

The following documentation is applicable for the project, and must be read in conjunction with this EMPr:

- Basic Assessment (BA) Report for the proposed Construction of the 88Kv Ararat-Bafokeng distribution powerline;
- Environmental Authorisation issued by the Competent Authority (CA), (once issued);and the
- The Final Walkdown Construction EMPr (once commissioned)

5. PROJECT RESPONSIBILITIES

5.1. ESKOM (Developer)

The ESKOM Team is responsible for ensuring that the development is implemented according to the requirements of the EMPr. Although the ESKOM Team appoints specific role players to perform functions on their behalf, this responsibility is delegated. The ESKOM Team is responsible for ensuring that sufficient resources (time, financial, human, equipment, etc.) are available to the other role players (e.g., the ECO, CELO and contractor) to efficiently perform their tasks in terms of the EMPr. The ESKOM Team is liable for restoring the environment in the event of negligence leading to damage to the environment.

The ESKOM Team must ensure that the EMPr is included in the tender documentation so that the contractor who is appointed is bound to the conditions of the EMPr. The ESKOM Team must appoint an independent Environmental Control Officer (ECO) during the construction phase to oversee all the environmental aspects relating to the development.

5.2. Contractor

The Contractor, as the ESKOM's agent on site, is bound to the EMPr conditions through its contract with the ESKOM Holdings SOC Limited and is responsible for ensuring that it adheres to all the conditions of the EMPr. The contractor must be thoroughly familiarised with the EMPr requirements before coming onto site and must request clarification on any aspect of these documents, should they be unclear. The contractor must ensure they have provided sufficient budget for complying with all EMPr conditions at the tender stage.

The contractor must comply with all orders (whether verbal or written) given by the ECO, project manager or site engineer in terms of the EMPr.

5.3. Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) is appointed by the ESKOM Holdings SOC Limited as to monitor the implementation of the EMPr and monitor project compliance. The ECO must form part of the project team and be involved in all aspects of project planning that can influence environmental conditions on the site. The ECO must attend relevant project meetings, conduct inspections to assess compliance with the EMPr and be responsible for providing feedback on potential environmental problems associated with the development. In addition, the ECO is responsible for:

- Liaison with relevant authorities;
- Liaison with contractors regarding environmental management;
- Undertaking routine monitoring and identifying a competent person/institution to be responsible

for specialist monitoring, if necessary; and

- The ECO has the right to enter the site and undertake monitoring and auditing at any time, subject to compliance with health and safety requirements applicable to the site (e.g., wearing of safety boots and protective head gear).

The ECO will also be responsible for conducting the environmental induction-training course in order to provide the site Employees with an understanding of ESKOM's policies regarding safety, health and environmental issues. This will include the overall objective of the EMPr and of their roles and responsibilities. The typical environmental induction-training course must include:

- A site induction;
- Emergency incident and response training;
- Familiarisation with site environmental controls;
- Specific environmental training for relevant Employees; and
- Convey areas of environmental sensitivity to the attention of Employees and also procedure with regard to these areas.

5.3.1. Liaison with Authorities

The ECO will be responsible for liaising with the CA. The ECO must submit monthly environmental reports and quarterly audit reports to the authorities. These environmental and audit reports must contain information on the contractor and ESKOM's levels of compliance with the EMPr.

The audit report must also include a description of the general state of the site, with specific reference to non-compliance. The ECO is to recommend corrective action measures to eliminate the occurrence of the non-compliance incidents. In order to keep a record of any impacts, an Environmental Log Sheet (refer to **Appendix A**) must be kept on a continual basis.

5.3.2. Liaison with Contractors

The ESKOM EO is responsible for informing the contractors of any decisions that are taken concerning environmental management during the construction phase. This would also include informing the contractors with the necessary corrective action to be taken.

5.4. Contractor Environmental Liaison Officer (CELO)

The contractor must appoint an Environmental Liaison Officer (CELO) to assist with day-to-day monitoring of the construction activities. Any issues raised by the ECO will be routed to the CELO for the contractors' attention and subsequently, CELO liaise with the main contractor for his or her attention. The CELO must be permanently on site during the construction phase to ensure daily environmental compliance with the EMPr and must ideally be a senior and respected member of the construction crew.

6. THE PROJECT PROCESS AND PHASES

The detailed and overall process that is undertaken for the planning, construction and operation of the proposed project is as follows:

(a) Basic Assessment: This EMPr is submitted together with the Basic Assessment Report to the CA for authorisation of the proposed project.

(b) Environmental Impact Assessment: The EMPr is further submitted together with the Final BAR to the CA. After approval and the issuing of an EA, the EMPr will be refined through development of a site-specific construction EMPr.

(c) Preliminary placement of the route alignment profile: Once the agreements to register the servitude with the respective landowners are successful, the Surveyors will prepare a preliminary route alignment profile.

(d) Walk down Process: The walk down process is a pre- requisite activity for the design and negotiation process, whereby specialists are appointed to undertake detailed surveys of the proposed 88 kV power line corridor. The Specialist team will comprise of an ecologist, watercourse and heritage practitioner The three main objectives of the walk down process is to;

   a. Identify sensitive areas, with regards to the respective fields of specialisation,

   b. To recommend local deviations and site position modifications to avoid these areas and appropriate mitigation measures where deviations are not possible; and

   c. To present a preferred route in accordance with the specialists' fields of expertise.

(e) Final profiles for construction: The information generated from the walk down process will be issued to the design engineers to generate a final profile of the power line equipment.

(f) Erection of campsites for the Contractors' workforce: The appointed Contractor will have to negotiate with respective landowners in order to acquire land for the establishment of the campsite. The campsite will be used for duration of the construction phase and thereafter it has to be cleaned and rehabilitated and the land evacuated.

(g) Negotiations for access roads to the servitude: ESKOM and the respective landowners will agree on the access road including the access points to be used by ESKOM to gain entry to the servitude through the landowner's properties.

(h) Servitude gate installation to facilitate access to the servitude: Gates will be installed at the agreed upon points of entry at each property.

(i) Bush clearing: to facilitate access, construction and the safe operation of the 88 kV power line: A specific strip of vegetation cover has to be removed to facilitate access, construction and the safe operation of the 88 kV power line.

(j) Establishment of access roads on the servitude

(k) Transportation of equipment, materials and personnel

(l) Installation of tower equipment: Soil types and trial pits at each foundation point will be carried to determine foundation requirements. Thereafter, the foundations will be excavated to the required depth and steel reinforcement and concrete used to reinforce and stabilise them.

(m) Final inspection of power line: Once the construction of the power line is completed it will be tested to ensure it functions correctly.

(n) Rehabilitation of disturbed areas: Excess material and equipment is removed from the project area and the campsite. The disturbed environment is returned to a condition close to its original state.

(o) Signing off Landowners: ESKOM's internal procedures prescribe that landowners sign off a release forms confirming that the land was rehabilitated accordingly. There is a one-year guarantee on contractors' work during which all rehabilitation work must be completed.

(p) Handing and taking over of the servitude: The ESKOM Distribution head offices will check if the structures are operating correctly and all rehabilitation works implemented correctly, hand over the Power line to regional division for operation and maintenance.

(q) Operation and maintenance of the Power lines: On-going maintenance will be performed periodically throughout the operational life span of the 88 kV power line. This typically includes annual visits to inspect the 88 kV power line and at least one visit for servitude maintenance per year.

The point of departure for this EMPr is to take a practical approach, through addressing potential problems before they occur, thereby providing corrective measures that will be required during the construction and operational phases of the development. In particular, this EMPr deals with the following phases, as detailed below:

(a) Construction Phase

The final outcome of this EMPr, after the acceptance of the FBAR (and EMPr) and the issuing of an EA, is a site-specific construction Environmental Management Plan (CEMPr), therefore, details of the planning stage is not necessary. The bulk of the impacts during this phase will have immediate effect (e.g., noise, dust and water pollution). If the site is monitored on a continual basis during this phase, it is possible to identify these impacts as they occur. These impacts will then be mitigated accordingly in conjunction with a commitment to sound environmental management from the ESKOM Team.

(b) Operational Phase

By taking pro-active measures during the construction phases, potential environmental impacts emanating during the operational phase will be minimised. This, in turn, will minimise the risk and reduce the monitoring effort, but it does not make monitoring obsolete.

7. LEGAL FRAMEWORK

Depending on the type of development that is being proposed, certain legislation applies, either as a framework to guide the development process or as permit or approval requirements. In this case a construction of an 88kV distribution power is being proposed and this EMPr has been undertaken in accordance with provisions of the Constitution and principles of Integrated Environmental Management.

All legislation applicable to the development must be strictly enforced both during the construction and operational phases. The contractor must be acquainted with the relevant environmental legislation, including provincial and local government regulations, which are in place to ensure protection of the environment. The environmental legislation applicable to the project includes, but is not limited to, the following:

- The Constitution of the Republic of South Africa, 1996;
- National Environmental management Act, 1998 (Act No. 107 of 1998) (NEMA);
- National Environmental Management: Air Quality Management Act (Act No. 39 of 2004);
- National Water Act, 1998 (Act No. 36 of 1998);
- Occupational Health and Safety Amendment Act (Act No. 181 of 1998);
- Hazardous Substances Act, 1973 (Act No. 15 of 1973);
- National Environmental Management: Waste Act (Act No. 59 of 2008);
- The National Heritage Resources Act;
- Conservation of Agricultural Resources Act;

(a) The Constitution of the Republic of South Africa

The Constitution of South Africa states that everyone has the right to an environment that is not harmful to his or her health or well-being and to have the environment protected for the benefit of present and future generations. The Act implies that measures must be implemented to:

- Prevent pollution and ecological degradation;
- Promote conservation, and
- Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

(b) The National Environmental Management Act (Act 107 of 1998)

There are various elements within the National Environmental Management Act that are relevant to the construction and operational phases of the project. The 'polluter pays' concept is enforced to ensure that any party or parties, which undertakes any activity that may cause, causes or caused any pollution, must prevent, mitigate or remedy the effects.

Section 2 of Chapter 1 of the National Environmental Management Act provides details of the environmental management principles that must be adhered to during both the construction and operational phase of the development. The consideration of various factors must be brought into focus:

- Avoidance/minimisation of the loss of biodiversity,
- Avoidance/minimisation of the disturbance of ecosystems,
- Avoidance/minimisation of pollution,
- Avoidance/minimisation of cultural and heritage sites,
- Avoidance/minimisation/recycling of waste,
- Responsible and equitable use of renewable and non-renewable resources, and
- Avoidance/minimisation/mitigation of adverse impacts.

(c) The National Environmental Management: Air Quality Act (Act 39 of 2004

The National Environmental Management: Air Quality Act (NEMAQA) is the main legislative piece that controls air pollution within South Africa. The main objective of the NEMAQA is to restore, protect and enhance the quality of air in South Africa, through sustainable development. The NEMAQA aims to achieve these objectives through the establishment of norms and standards and provide a regulatory framework for air quality management planning and reporting.

(d) National Environmental Management: Biodiversity Act (Act 10 of 2004)

The Biodiversity Act provides for the management and conservation of South Africa's biodiversity within the framework of NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was established. The Biodiversity Act further requires landowners to manage and conserve South Africa's biodiversity for current and future generations. The National Spatial Biodiversity Assessment classifies areas as worthy of protection based on their biophysical characteristics, which are ranked according to priority levels.

(e) Occupational Health and Safety Amendment Act (Act 85 of 1993)

The Act makes provision for the health and safety of persons at work and persons that are not employees against any hazards that may arise out of or in connection with the work-related activities. The act has provisions regarding the maintenance and operation of plant and machinery, working conditions to the use of protective clothing and equipment. The Act therefore informs the EMPr on measures and procedures to be incorporated regarding the safety and health of the persons on site.

(f) Hazardous Substances Act (Act 15 of 1973)

The main objectives of the Hazardous Substances Act are to provide measures, norms and standards for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure. The Hazardous Substances Act also aims to provide for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products.

(g) The National Environmental Management: Waste Act (Act 59 of 2008)

The National Environmental Management: Waste Act is the main legislative piece that aims to consolidate waste management within South Africa. Part 2 of the Waste Act details the general duty in respect to the management of waste by the holder of the waste. In accordance with Section 16(1) of the Waste act, 'a holder of waste must, within the holder's power, take all reasonable measures to:

A. avoid the generation of waste and where such generation cannot be avoided to minimise the toxicity and amounts of waste that are generated;
B. reduce, re-use, recycle and recover waste;
C. where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;
D. manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour or visual impacts;
E. prevent any employee or any person under his or her supervision from contravening this Act; and
F. Prevent the waste from being used for an unauthorised purpose.

(h) The National Heritage Resources Act (Act 25 of 1999)

The Act aims to promote an integrated system for the identification, assessment, and management of the heritage resources of South Africa. Section 35(4) of this above-mentioned Act states that no person may, without a permit issued by the responsible heritage resources authority; destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site or any meteorite.

This Act is concerned with the protection of the archaeological or paleontological sites or meteorites. Furthermore, Section 36(3) of the National Heritage Resources Act states that no person may, without a permit issued by the relevant heritage resources authority handle any human remains. Human remains can only be handled by a registered undertaker or an institution given the authority to do so under the Human Tissues Act (Act 65 of 1983 as amended).

7.1. POSSIBLE PERMITS

Heritage permit

In the event that any heritage artefacts are found on site, it would be necessary to apply for a Heritage Permit under the National Heritage Resource Act, 1999 (Act No. 25 of 1999).

Removal of protected trees permit

In the event whereby Red Data plants are affected by construction activities, measures must be taken to avoid or rescue these plants. The following species require permits to remove or destroy these species in terms of National Forest Act No 84 of 1998.

8. PURPOSE OF THE EMPr

The main driving force behind the compilation of this EMPr is to outline measures that are to be implemented in order to minimise undesirable direct, indirect or cumulative environmental impacts associated with the development of the proposed project. This is done by encouraging good management practices through planning and commitment of environmental issues and complying with all applicable laws, regulations, standards and guidelines for the protection of the environment.

The EMPr serves as a guide for contractors and employees on their roles and responsibilities concerning environmental management on site. Furthermore, it provides a framework for environmental monitoring throughout the development's life cycle.

8.1. Objectives of the EMPr

The objective of this EMPr is to ensure that:

- Environmental management conditions and requirements are implemented from the start of the project,
- The contractor is able to and must include any costs of compliance with this EMPr into the tender price;
- Precautions against environmental damage and claims arising from such damage are taken timeously;
- The completion date of the contract is not delayed due to environmental problems with the landowner, communities or regulatory authorities arising during the course of the project execution;
- The asset created conforms to environmental standard required by ISO 14001 and Transmission Policy;
- ESKOM Project manager and Contractor must take into consideration any landowner special conditions,
- Environmental conditions stipulated in the Environmental Authorisation (EA), which is still to be issued, are implemented;
- Resolve problems arising immediately to ensure a smooth flow of operations;
- Implementation of this EMPr for the benefit of all involved;
- And Preservation of the natural environment by limiting destructive activities on site.

9. THE PROJECT PROCESS AND PHASES

The point of departure for this EMPr is to take a practical approach, through addressing potential problems before they occur, thereby providing corrective measures that will be required during the construction and operational phases of the development. In particular, this EMPr deals with the following phases, as detailed below:

- **Pre-construction phase:** This section usually provides guidelines on pre-construction activities including site establishment and clearance; environmental induction and training and awareness. site access and health and safety;
- **Construction phase:** This section usually provides guidelines on construction methods and considerations. The bulk of the impacts during this phase will have immediate effects (e.g., noise, dust and water pollution). If the site is monitored on a continual basis during this phase, it is possible to identify these impacts as they occur. These impacts will then be mitigated accordingly in conjunction with a commitment to sound environmental management from the ESKOM Team.
- **Operational phase:** The section of the EMPr usually provides guidelines on the operational phase of the development. By taking pro-active measures during the construction phases, potential environmental impacts emanating during the operational phase will be minimised. This, in turn, will minimise the risk and reduce the monitoring effort, but it does not make monitoring obsolete.
- **Decommissioning phase:** This section is included in this EMPr as the proposed activity requires decommissioning of a distribution power line, and as such provides management.

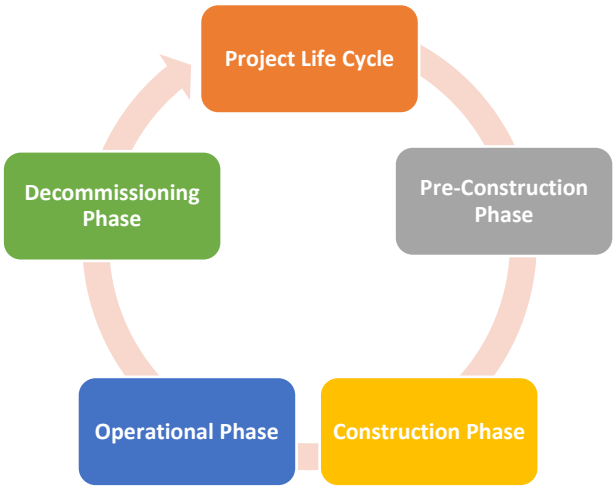


Figure 5: Project Life Cycle

10. ENVIRONMENTAL MONITORING AND AUDITING

A monitoring programme must be in place to not only ensure compliance with the EMPr through the contract / work instruction specifications, but also to monitor any environmental issues and impacts, which have not been accounted for in the EMPr that are or could result in significant environmental impacts for which corrective action is required.

As part of the contract or work instruction before the developer will stipulate the period and the frequency of monitoring required. This will be determined from applicable permits and authorisations from authorities. The Project Manager (PM) will ensure that the monitoring is carried out. The monitoring programme will include:

- Once off audit to be conducted by the Environmental Consultant or Representative during the decommissioning of the proposed 88kV distribution power line.
- Compilation of an audit report with a rating of the compliance with the EMPr. This report will be submitted to the relevant environmental authority. The Environmental Consultant or Representative must keep a photographic record of the proposed 88kV distribution power line before and after construction on site.

10.1. Compliance with the EMPr

- A copy of the EMPr must be kept on site during the construction period at all times. The EMPr will be made binding on all construction and must be included as Contractual Clauses in any contractual agreement between the proponent and Contractor. It must be noted that in terms of the National Environmental Act 1998 (Act No. 107 of 1998), (Section 28) those responsible for Environmental Damage must make provision for any costs associated with remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health (“polluter pays principle”).
- All persons employed by the contractor will abide by the requirements of the EMPr.
- Contract conditions to include measures to be taken in the event of a construction workforce found to be in breach of any of the specifications contained within the EMPr.
- The Contractor will not direct a person to undertake any activity which would place them in contravention of the specifications contained within the EMPr.
- In the event where the Contractor be in breach of any of the specifications contained in the EMPr, the proponents PM will, in writing, instruct the Contractor responsible for the incident of non-compliance regarding corrective and/or remedial action required, specify a timeframe for implementation of these

actions, implement a penalty and/or indicate that work must be suspended in the event where non-compliance continues.

- In the event where non-compliance continues, further written notification will be forwarded to the Contractor responsible for the incident of non-compliance outlining the required corrective and/or remedial action, the timeframe for implementation, penalties and/or work could be suspended as specified previously.
- The proponents PM or Environmental Representative must notify the DFFE in writing, within 24 hours (or as the EA may specify) thereof if any condition of the EA is not adhered to.

10.2. Non-Conformance and Corrective Action

The Contractor is deemed not to have complied with the EMPr if:

- Within the boundaries of the site, site extensions and haul/ access roads there is evidence of contravention of clauses.
- If environmental damage ensues due to negligence.
- The contractor fails to comply with corrective or other instructions issued by the proponents Environmental Consultant or Representative within a specified time.
- The Contractor fails to respond adequately to complaints from the public, and or stakeholders.

The Developer is deemed not to have complied with the EMPr if:

- Within the boundaries of the site there is evidence of contravention of clauses.
- If environmental damage ensues due to negligence.
- They fail to respond adequately to complaints from the public.

10.3. Penalties for Non-Compliance

The penalty imposed will be per incident Unless stated otherwise in the project specification, the penalties imposed per incident or violation will be determined in consultation with DFFE and depending on the severity and/or regularity of the incidence occurring. The following incidents will be finable:

- Failure to demarcate working servitudes.
- Working outside of the demarcated servitude.
- Failure to stockpile materials in designated areas.
- Pollution of water bodies (including. increased suspended solid loads).

- Failure to control Stormwater runoff.
- Failure to provide adequate sanitation.
- Failure to remove waste off site to a registered waste disposal facility and retain Waste Manifests for the same.
- Failure to reinstate disturbed areas within the specified timeframe.
- Any other contravention of project specific specification.
- Poor housekeeping including water wastage, untidy site.

10.4. Training and Environmental Awareness

It is important to ensure that the contractor has the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimisation of environmental harm.

Training needs must be identified based on the available and existing capacity of site personnel (including the contractors) to undertake the required EMPr management actions and monitoring activities. It is vital that all personnel are adequately trained to perform their designated tasks to an acceptable standard

The environmental training is aimed at:

- Promoting environmental awareness;
- Informing the contractor of all environmental procedures, policies and programmes applicable;
- Providing generic training on the implementation of environmental management specifications; and
- Providing job-specific environmental training in order to understand the key environmental features of the construction site and the surrounding environment.

Training must be done in a verbally with slide presentations. The training will be a once- off event; however, the contractor must make provision for weekly training or Toolbox Talks. In addition to training, general environmental awareness must be fostered among the project's workforce to encourage the implementation of environmentally sound practices throughout its duration. This ensures that environmental accidents are minimised and environmental compliance maximized.

11. REPORTING PROCEDURES

11.1. Documentation

The following documentation must be kept on site in order to record compliance with the EMPr. An Environmental File which includes:

- Copy of the EMPr;
- Copy of the Environmental Authorisation;
- Copy of relevant legislation;
- Environmental Policy of the contractor
- Environmental Method statements compiled by the contractor
- Non- conformance Reports;
- Environmental register, which must include:
  - Communications Register- including records of complaints, and minutes and, attendance registers of all environmental meetings.
  - Monitoring Results- including environmental monitoring reports, register of audits, Non-Conformance Reports (NCR)
  - Incident book- including copies of notification of emergencies and incidents, this must be accompanied by a photographic record.
  - Waste manifests.
- Material Safety Data Sheets for all hazardous substances;
- Notification of Emergencies and Incidents.

11.2. Complaints Register

The proponent must put in place an Environmental Register; the contractor will ensure that the following information is recorded for all complaints/ incidents:

- Nature of complaint/ incident.
- Causes of complaint/incident.
- Party/parties responsible for causing complaint/incident.
- Immediate actions undertaken to stop/reduce/contain the causes of the complaint/incident.
- Additional corrective or remedial action taken and /or to be taken to address and to prevent re-occurrence the complaint/incident.
- Procedures to be undertaken and/ or penalties to be applied if corrective or remedial actions are not implemented.
- Copies of all correspondence received regarding complaints/incidents.

The above-mentioned records will form part of integral part of the contractor's records. These records will be kept with the EMPr and will be made available for security requested by the proponent.

11.3. Environmental Emergency Response

The Contactor's environmental emergency procedures must ensure appropriate responses to unexpected/ accidental actions/ incidents that could cause environmental impacts. Such incidents must include:

- Accidental discharges to water (i.e., into the water course) and land
- Accidental spillage of hazardous substances (typically petrol, oil, and diesel)
- Specific environmental and ecosystem effects from accidental releases or incidents.

The Environmental Emergency Response Plan is separate to the Health and Safety Plan as it is aimed at responding specifically to environmental incidents and must ensure and include the following:

- Construction employees must be adequately trained in terms of incidents and emergency situations;
- Details of the organisation (i.e., manpower) and responsibilities, accountability and liability of personnel;
- A list of key personnel and contact numbers;
- Details of emergency services (e.g., the fire department / on-site fire detail, spill clean-up services) must be listed;
- Internal and external communication plans, including prescribed reporting procedures;
- Actions to be taken in the event of different types of emergencies;
- Incident recording, progress reporting and remediation measures to be implemented; and
- Information on hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release.

The contractor must comply with the environmental emergency preparedness and incident and accident-reporting requirements as per the relevant legal requirements.

11.4. Method Statements

It is a statutory requirement to ensure the wellbeing of employees and the environment. To allow the mitigation measures in this document to be implemented, task-specific method statements must be developed for each set of tasks.

A Method Statement details how and when a process will be carried out, detailing possible dangers/risks, and the methods of control required:

- Type of construction activity;
- Timing and location of the activity;

- Construction procedures;
- Materials and equipment to be used;
- Transportation of the equipment to / from site;
- How equipment/material will be moved while on site;
- Location and extent of construction site office and storage areas;
- Identification of impacts that might result from the construction activity;
- Methodology and/ or specifications for impact prevention / containment;
- Methodology for environmental monitoring
- Emergency/ disaster incident and reaction procedures (required to be demonstrated); and
- Rehabilitation procedures and continued maintenance of the impacted environment.

The Contractor will be accountable for all actions taken in non-compliance of the approved Method Statements. The contractor must keep all the Method Statements and subsequent revisions on file, copies of which must be distributed to all relevant personnel for implementation.

As a minimum the following Method Statements will be required to be generated:

- Dust;
- Bush Clearing;
- Environmental monitoring;
- Erosion control;
- Personnel and public safety;
- Solid and liquid waste management;
- Rehabilitation of modified environment(s)

11.5. Responsibility of the Role Players

(a) Developer

The Developer is responsible for ensuring that the development is implemented according to the requirements of the EMPr. Although the ESKOM Team appoints specific role players to perform functions on their behalf, this responsibility is delegated. The Team is responsible for ensuring that sufficient resources (time, financial, human, equipment, etc.) are available to the other role players (e.g., the contractor) to efficiently perform their tasks in terms of the EMPr. The Team is liable for restoring the environment in the event of negligence leading to damage to the environment.

(b) Contractor

The contractor is ESKOM's agent on site, and therefore is bound to the EMPr conditions through its contract and is responsible for ensuring that it adheres to all the conditions of the EMPr. The contractor must be

thoroughly familiarised with the EMPr requirements before coming onto site and must request clarification on any aspect of these documents, should they be unclear. The contractor must ensure they have provided sufficient budget for complying with all EMPr conditions at the tender stage. The contractor must comply with all orders (whether verbal or written) given by the ECO, project manager or site engineer in terms of the EMPr.

(c) Environmental Consultant or Representative

The Environmental Consultant or representative's duties must include, inter alia, the following:

- Reviewing Method Statements;
- Advising the Contractor and / or supervisor on environmental issues within defined areas;
- Undertaking periodic site visits to ensure compliance with the EMPr and verifying that environmental impacts are kept to a minimum throughout the activity;
- Completing environmental checklists during site visits;
- Keeping a photographic record of progress on site from an environmental perspective;
- Assisting the Contractor in finding environmentally acceptable solutions to problems;
- Recommending additional environmental protection measures should this be necessary;
- Assisting the Engineer or Supervisor in ensuring that the necessary environmental authorisations and permits have been obtained;
- Ensuring that DFFE is informed of work progress on site;
- Reporting any incidents that may or have caused damage to the environment or breaches of the EMPr to DFFE;
- Recommending the issuing of fines for transgressions of site rules and penalties for contraventions of the EMPr;
- Advising on the removal of person(s) and/or equipment not complying with the specifications ; and

The Environmental Consultant or Representative must visit the site before and after proposed activities. Thus, to ensure an adequate evaluation and or audit is done to reflect the contractor's performance towards compliance of the EMPr.

12. ENVIRONMENTAL MANAGEMENT PROGRAMME

The following tables form the core of this EMPr for the construction and operational phases of the development. These tables must be used as checklists on site, especially during the construction phase. Compliance with this EMPr must be audited weekly or monthly depending on duration during the construction phase and once immediately following completion of construction. This must be followed up with annual audits for a period of two years during the operational phase.

Table 3: Environmental Management Programme for the Proposed Construction of an 88kV Ararat-Bafokeng distribution power line (Construction Phase)

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	FREQUENCY
Appointment and Duties of ECO	• The Developer must appoint an independent Environmental Control Officer (ECO) who must monitor the contractor's compliance with the EMPr.	• Developer	• Monitor monthly
	• The Developer must provide the contractor and sub-contractors with a copy of the EMPr.	• Developer	• Once-off
	• The priority of the ECO is to maintain the integrity of the development conditions outlined in the EMPr.	• ECO	• Continuous
	• The ECO must form part of the project management team and where possible attend all relevant project meetings.	• ECO	• Continuous
	• The contractor must ensure that the contractors and sub-contractors attend an environmental briefing and training session presented by the ECO prior to commencing activities on site.	• Contractor, ECO	• Once-off
EMPR	• This EMPr must be made binding to the main contractor as well as individual sub-contractors and must be included in tender documentation for the construction contract.	• Developer	• Once-off
Environmental Awareness Training	• The Contractor must ensure that the construction team and all sub-contractor/s are familiar with the EMPr requirements and have a basic level of Environmental Awareness Training. • The Contractor must undertake Environmental Awareness. • Induction Training prior to the start of any construction activities on site. • Topics to be covered by the training must include: • Explanation of what is meant by "environment" and why the environment needs to be protected and conserved • Awareness of emergency and hazardous spills response provisions; • Prevention of pollution and litter control and the minimization of disturbance to sensitive areas; • Social responsibility during construction. This entails being considerate of local landowners;	• Developer, Contractor, • ECO	• Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	FREQUENCY
	• Construction Workers need to be made aware that they are not to make excessive noise (e.g., shouting/hooting); • The need for a "clean site" policy also needs to be conveyed to construction workers; • Workers conduct on site which encompasses a general regard for the social and ecological wellbeing of the site and adjacent areas. • No alcohol / drugs to be present on site and no firearms permitted on site or in vehicles transporting staff to / from site, (unless used by security personnel); • Prevention of noise and unsocial behaviour; • Bringing pets on site is forbidden; • No harvesting of fruit or firewood from the site or from areas adjacent to it; • Workers are to make use of facilities provided for them, as opposed to ad-hoc alternatives (e.g., the use of surrounding bush as a toilet facility is forbidden; fires for warmth or cooking are for bidden); • Trespassing on private / commercial properties bordering the • site is forbidden; and • Other than pre-approved security staff, no workers must be • permitted to live on site unless deemed necessary due to the • specific project		
Sanitation	• The Contractor must install mobile chemical toilets on the site. • Staff must be sensitised to the fact that they must use these facilities at all times. No indiscriminate sanitary activities on site must be allowed. • Pollution of ground and surface water must be avoided • Project workers are not to use rivers for washing or bathing • Ablution facilities must be within 100m from workplaces but not closer than 50m from any natural water bodies or boreholes. There must be enough toilets available to accommodate the workforce. • The ablution facilities must be clearly marked to distinguish between males and females and toilet paper must be provided thereto.	• Developer, Contractor	• Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	FREQUENCY
	• Mobile toilets must be emptied at regular intervals by suitably qualified contractors, according to appropriate health and safety standards. • Mobile toilets must be secured to prevent them blowing over during periods of high winds		
Environmental incidents	• The contractor must take corrective action to mitigate an incident appropriate to the nature and scale of the incident and must also rehabilitate any residual environmental damage caused by the incident or by the mitigation measures themselves.	• ECO, Contractor	• Continuous
Emergency Preparedness	• If chemicals in sufficient quantity and toxicity have the potential to be released on the construction sites, emergency contingency plans must be prepared as safety measures (Bunded areas). These safety measures must be communicated to the relevant personnel on the construction site. All hazardous installations require a Risk Assessment in terms of the Occupational Health and Safety Act, (Act No.85 of 1993) for construction sites.	• Engineer, Developer, ECO	• Once off
Permits and Permissions	• The Developer must ensure that all pertinent permits, certificates and permissions have been obtained prior to any activities commencing on site and ensure that they are strictly enforced /adhered to. • The Contractor must maintain a database of all pertinent permits • and permissions required for the contract as a whole and for critical activities for the duration of the contract.	• Contractor, Developer	• Continuous
Waste	• Waste bins onsite must be labelled and waste be disposed as per the labelling thereof. • Waste must be disposed at the licensed municipal waste disposal site.	• Contractor	• Continuous
General	• Prior to establishment of the site camp(s), the Contractor must produce a plan showing the positions of all buildings, laydown yards, and other infrastructure for approval by the ECO/EO.	• Contractor, ECO,EO	• Once-off
	• On completion of Works, the Contractor must clear away and remove from the site all construction paint, surplus materials, foundations, plumbing and other fixtures, rubbish and temporary works of every kind.	• Contractor, ECO/EO	• Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	FREQUENCY
	• All persons employed by the Contractor or his or her subcontractors must abide by the requirements of these General Environmental Protection Specifications. Any employees of the Contractor or his or her subcontractors found to be in breach of any of the General Environmental Protection Specifications must be ordered by the ECO to leave the site forthwith. The order must be given orally or in writing. Confirmation of an oral order will be given as soon as practicable but lack of confirmation in writing must not be a cause for the offender to remain on site. No extension of time will be granted for any delay or impediment to the Contractor brought about by a person ordered to leave the site.	• Contractor, ECO,EO	• Continuous
	• No uncontrolled discharges from the site/working area. All discharge points will require approval from the ECO. Discharges include concrete mixing, vehicle washing etc.	• Contractor, ECO	• Continuous
	• Construction equipment must not move outside the area defined as the site.	• Contractor, ECO	• Continuous
	• The site must be responsibly managed to reduce risks to groundwater.	• Contractor	• Continuous
Erosion, sedimentation and flooding	• Construction equipment and machinery must be kept in a demarcated area. The loss of oils and fuel onto the ground must be limited and contained. Where oils have leaked onto the soil, this soil must be removed and either; • Disposed of at an approved dumping site at the end of the construction phase or as required by the ECO. Drip trays must be used to collect oil leaks.; or • Rehabilitated on-site with appropriate rehabilitation chemicals and mixes	• Contractor, ECO	• Continuous
Work area	• The gravel access roads to various points along the proposed route must be no more than 6m wide. • Soil and vegetation to be stripped only from project footprint area. No-go areas (if any) to be clearly fenced off. • Construction camp to be clearly demarcated including all Contractor's buildings lay down areas, etc. • All identified protected tree species must be marked within the project footprint. • All employees must be educated on identifying protected tree species.	• Contractor, Engineer, ECO	• As necessary

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	FREQUENCY
Effects of construction camp	• The contactor appointed for the construction of the power line must set up one site camps. Alternatively, the contractor must however prefer to use a fully serviced site in another location.	• Contractor, ECO	• Once-off
Crime, safety and security	• Security fence is to be inspected daily to ensure no illegal entry points are created.	• Developer, Contractor	• Daily
	• Do not allow the movement of public within the development site by posting notices at the entrance gates, and where necessary on the boundary fence.	• Developer, Contractor	• Continuous
	• The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act, 1993 (Act No.85 of 1993)	• Contractor	• Daily
	• Ensure that the handling of equipment and materials is supervised and adequately instructed.	• Contractor	• Continuous
	• Appropriate notification signs must be erected, warning the residents and visitors about the hazards around the construction site and presence of heavy vehicles • Vehicular traffic during construction activities must be limited to a maximum speed limit of 30 km/hr.	• Contractor	• Continuous
Noise pollution	• The development must comply with the local by-laws regarding health and noise.	• Contractor	• Daily
	• Institute noise control measures during construction for all applicable activities and maintain machinery in good working order.	• Contractor	• Daily
	• Construction equipment must only operate between the hours of 07H00 and 17H00 weekdays and Saturdays. Operation is permissible on Sundays and public holidays as per the Contractor's schedule. • Inform residents of nearby residential areas of planned noisy activities outside the timeframes stated above.	• Developer, Contractor	• Once off
Atmospheric pollution	• Dust production must be controlled by regular watering of roads and works area, should the need arise.	• Contractor	• As necessary
	• No refuse wastes are burnt on the premises or on surrounding premises.	• Contractor	• Daily

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	FREQUENCY
	• All vehicles transporting material that can be blown off (e.g., soil, rubble etc.) must be covered with a tarpaulin, and speed limits of 30 km/h must be adhered to.	• Contractor	• Spot checks: daily-weekly, as necessary
	• Vehicles to be used during the construction phase are to be kept in good working condition so as not to be the source of excessive fumes and nuisance.	• Contractor	• Daily
Visual impact	• Rubble and litter must be removed on a weekly basis and be disposed of at a suitably registered landfill	• Construction crew	• Weekly
	• Advertising on site must be in accordance with South African Manual for Outdoor Advertising Control (SAMOAC).	• Developer	• Continuous
	• The construction camp must be contained to prevent any visual intrusion and be kept in a clean and orderly state at all times.	• Contractors	• Continuous
Waste	• Rubble must be removed from the construction site and disposed of at a registered Municipal dumping site	• Contractor	• Continuous
	• Sufficient and covered containers must be on the construction site to handle the amount of litter, wastes, and rubbish, debris and builders' wastes generated on the site. • All waste skips must be clearly marked. (For example, paper, glass and plastic).	• Contractor	• Continuous
	• Containers must be emptied frequently to avoid rodents, insects or any other organisms accumulating on the site and becoming a health hazard to adjacent properties.	• Contractor	• Continuous
	• No waste must remain on the construction site for more than a month; however, if the waste is in minimal amounts, it must be permissible for the waste to be onsite for longer.	• Contractor	• Continuous
Waste (Liquid)	• All liquid effluent must be disposed of in a manner approved by the Local Authority • Ablution facilities must be available to all workers	• Contractor	• Continuous
Adequacy of waste disposal facilities	• All contracts with subcontractors must contain a clause to the effect that the disposal of all construction-generated refuse/waste to an officially approved	• Developer, sub-contractors	• Once-off, monitor weekly

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	FREQUENCY
	dumping site is the responsibility of the subcontractor in question and that the subcontractors are bound to the management activities stipulated in this EMPr.		
	• All solid and chemical wastes that are generated must be removed and disposed of at a licensed waste disposal site.	• Contractor	• Continuous
	• Chemical containers and packaging brought onto the site must be removed for disposal at a suitable site. Proof of service must be filed onsite.	• Contractor	• As necessary
	• Burning of waste is not permitted.	• Contractor	• Continuously
Storm Water Management	• Litter blocking storm water system must be removed. • Adequate Stormwater Management must be implemented as part of the proposed activity to prevent erosion and sedimentation of the surrounding wetlands, floodplains and rivers: ○ Sheet runoff from access roads must be curtailed; and ○ Runoff from exposed surfaces must be slowed down by strategic placement of berms. ○ The site must be managed in order to prevent pollution of drains, downstream watercourses or groundwater, due to suspended solids, silt or chemical pollutants. ○ Silt fences must be used to prevent any soil entering the storm water drains. ○ Promote water saving mind set with construction workers in order to ensure less water wastage. ○ New storm water infrastructure construction must be developed strictly according to specifications from ECO in order to ensure efficiency. • To prevent Stormwater damage, the increase in Stormwater runoff resulting from construction activities must be estimated and the drainage system assessed accordingly. • Hazardous substances must be stored at least 20m away from the buffer area surrounding any water bodies on site to avoid pollution. • The installation of the storm water system must take place, to attenuate storm water from the construction as well as the operational phase.	• Developer • Contractor	• Bi-weekly • Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	FREQUENCY
	• Earth, stone and rubble is to be properly disposed of so as not to obstruct natural water path ways over the site. (I.e., these materials must not be placed in storm water channels, drainage lines or rivers). • There must be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed.		
Storm Water Management	• If a batching plant is necessary, run-off must be managed effectively to avoid contamination of other areas of the site. Runoff from the batch plant must not be allowed to get into the storm water system or nearby streams, rivers or erosion channels or dongas. • Cement mixing and batching must be undertaken so not to impact the natural water resources on site. Appropriate measures to prevent runoff escaping from the mixing/batching area must therefore be taken. • Cement must be mixed on an appropriately lined surface. • Wastewater from batching operations or ready-mix trucks must be discharged into a lined pond or watertight container provided for this purpose. The pond is to be de-sludged regularly, and the cement residue removed from site and disposed of at an appropriately licensed disposal facility. • No water contaminated with cement must be allowed to enter any natural water course or drainage line. • Workers are not to use rivers for washing or bathing. • No human waste will be allowed to enter any water courses or natural drainage lines. • Earth, stone and rubble must not be placed in Stormwater channels, drainage lines or rivers, nor is such material to be excavated. • Further principles that must be followed in terms of temporary Stormwater management on site include: • The avoidance of the use of high velocity Stormwater pipelines in favour of open, high friction, semi-permeable channels wherever feasible;		

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	FREQUENCY
	• The construction of a number of smaller Stormwater outfall points instead of a few large outfall points; • The design of Stormwater outfalls must facilitate reduced flow velocity and minimize and avoid stream banks and soil erosion through design features such as Reno mattresses or splitter blocks.		
Storm Water Management Excavation	• Similarly, un-channelled flow must be controlled to avoid erosion (i.e., brush packing). • In situations where the surface run-off is concentrated, flow must be attenuated by contouring with hay bales/berms. These must channel concentrated flow into detention/attenuation ponds or areas protected with hay bales for flow minimisation and sediment trapping. • Furthermore, physical measures that must be taken to prevent Stormwater pollution include: o Where necessary, rock pitched diversion ditches or berms are to be used to divert water runoff away from exposed soil or construction areas. Silt fences must also be used; - Separate Stormwater collection areas and interceptors at fuel storage areas, batching plants and other potentially polluting activities must be constructed; o The use and storage of all materials, fuels and chemicals, which could leach into the ground, must be controlled. o Any residue from spillages must be removed from site by appropriate contractors. Handling, storage and disposal of excess or containers of potentially hazardous materials must be in accordance with the requirements of the adjudicating authority or any other relevant department. o Erosion gullies and rills within the construction site must be rehabilitated immediately and the root cause of the erosion dealt with immediately. • The topsoil cleared must be retained. The topsoil contains most of the inorganic matter, decomposed organisms and nutrients, thus the removal of the topsoil constitutes a major loss in terms of ecosystem function. In order to ensure that the minimal amount of soil is removed with vegetation clearance, it is strongly	• ECO, Contractor	• Once off, monitor weekly

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	FREQUENCY
	advised that vegetation be harvested as close to ground level as possible before earthworks machinery is utilised. Soil removed in this manner will contain the existing seed bank, stolons, rhizomes and runners as well as an additional supply of organic matter that will be beneficial during the early stages of vegetation reinstatement. Harvested grass must be retained and used as a mulch to combat erosion. • Topsoil and subsoil must be placed on opposite sides of the trench and must be kept separate throughout construction and rehabilitation. • Topsoil must not be stockpiled for an extensive period (> 3 months). This is to prevent the redundance of the existing seed bank as well as the alteration of the soil characteristics • Erect signs and/or danger tape around the exposed excavations to warn the public of the inherent dangers.		
Stockpiling soil	• Ensure that excavated and stockpiled soil material is stored and bermed on the higher lying areas of the site and not in any storm water run-off channels or any other areas where it is likely to cause erosion or where water would naturally accumulate. • The areas where excavated soil will be stockpiled must be bordered by berms to prevent soil loss caused by rain. • Soil stockpiles must not be higher than 2m	• ECO, Contractor • ECO, Contractor	• Once off, monitor weekly
Groundwater quality	• All areas where hazardous goods are stored must be lined with impermeable plastic sheets underneath to prevent percolation and seepage of the hazardous materials into the groundwater systems. • Drip trays must be used at all vehicle servicing points. • Portable ablutions must be well maintained regularly.	• Developer, Engineer	• As necessary
Hazardous Substances / Materials Management	• The selection of the site for the storage of materials needs to consider the prevailing winds, distance to water bodies and general on-site topography. These areas need to be designated in the Construction Camp layout plan and demarcated and fenced, if necessary.	• ECO, Contractor	• Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	FREQUENCY
	• Hazardous substance storage areas must be secured and safe from access from unauthorised personnel, children and animals. They must be located 100m from any watercourse / wetland and outside of the 1:100-year floodline. • A number of general requirements relating to the use of construction materials must be adhered to, these include: • The mixing of all concrete must occur on a designated, impermeable surface or mixing board; • Lime and other powders must not be mixed during very windy conditions; • Similarly, the spraying of herbicides or pesticides must not occur under windy conditions and must comply with OSHA regulations and other chemical handling laws; • All substances required for vehicle maintenance and repair must be stored in sealed containers until they can be disposed of/removed from the site; and • Hazardous substances / materials are to be transported in sealed containers or bags.		
Flow of information	• All communication with the public is to be handled by Councillor or Community Liaison Officer.	• Developer	• As necessary
	• Site inspections are to be conducted by the Developer and contractor as necessary during the course of the works or as agreed by the parties involved. • Operation inspections must occur annually.	• Developer, Contractor	• As necessary
	• The inspections must refer to the implementation of the above-mentioned actions as well as any other matters of concern. • Monthly audits, during the construction phase, must be undertaken to ensure that the EMPr is implemented and sound environmental management occurs in the operational phase. This must be done by the ECO.	• ECO, Representative • Developer • Any relevant party	• Monthly
	• Adjacent land users must be informed in advance of construction activities commencing in vicinity of their properties	• Developer	• As necessary

Table 4: Environmental Management Plan for the proposed construction of an 88kV Ararat-Bafokeng distribution power line (Operational Phase)

ACTIVITY/ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	FREQUENCY
Development Maintenance	• All maintenance work must be done in terms of the Occupational Health and Safety Act, (Act No.85 of 1993)	• Developer	• As Required
Dust Impact	• All forms of dust/air pollution must be managed in terms of the NEMA Air Quality Act (AQA) 2004, (Act 39 of 2004); this includes the control of noxious and offensive gases, smoke, dust and vehicular emissions. Under no circumstances must heavy smoke be released into the air • Dust production must be controlled by regular watering of roads and works area, should the need arise. • Wet all unprotected cleared areas and stockpiles with water to suppress dust pollution during dry and windy periods. • During the transfer of material to stockpiles, drop heights must be minimised to control dispersion of materials being transferred. Stockpiles must be maintained for as short a time as possible and a water spray system implemented to contain windblown particles. Wind breaks could also be used at stockpiles to reduce the erosive forces of the wind. • While being transported, by either road or rail the concentrates must be covered to prevent the spread of dust and particulate matter.	• Developer, Contractor, ECO	• Continuous
Fire Outbreaks	• No open fires must be permitted on site to prevent loss of habitat and risks to fauna. A fire action plan must be in place. All contractors will be informed on the firefighting strategy.	• Developer, Contractor, ECO	• Continuous
Soil Erosion and Contamination	• Restriction of movement of vehicles, workers or fauna on, or over stockpiles. • To prevent diesel and oil spills, all vehicles and equipment will be kept in good working condition and all leaks repaired immediately. • All generators and vehicles will be placed on drip trays to catch all spills and leaks, while all maintenance work on equipment, vehicles, machinery, etc. will be done over a plastic tarpaulin or steel drip trays. • Maintenance of machinery, vehicles and reticular system must be done regularly.	• Developer, Contractor, ECO	• Continuous

	• A drum for the collection of spilled oils and fuels, together with a plastic tarpaulin to catch spills and leaks before they can contaminate soil and underlying groundwater, must be available on-site at all times.		
Ground water contamination	• Ensure contaminated run-off does not come into contact with surface water or groundwater resources.	• Developer, Contractor, ECO	• Continuous
Noise impact	• All activities on the site must abide by the local noise by-laws. • Construction operations must be limited to daylight (working hours), 07h00 to 17h00. • Inform residents of nearby residential areas of planned noisy activities outside the timeframes stated above. • Prior to blasting (if required), the contractor must inform the adjacent landowners at least five days in advance.	• Developer, Contractor, ECO • Contractor	• Continuous • As required
Visual and aesthetic	• Maintain perimeter fencing in order to ensure that they do not deteriorate and result in an aesthetically unpleasing development. • Prevent unnecessary removal of vegetation outside the width of the working area by clearly demarcating the working area.	• Developer, Contractor	• Continuous
Solid Waste Management	• The proposed project must be kept clean through the removal of litter on a daily basis. This must be included in a maintenance plan for the development.	• Developer • Developer	• Weekly • Daily
	• Ensure that the garbage is collected on a regular basis.	• Developer	• Regularly

12.1. ECOLOGY

ACTIVITY/ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	FREQUENCY
Removal of vegetation	• Place construction camps in already transformed areas such as cultivated fields or revamping derelict homesteads or other abandoned infrastructure. • New borrow pits must be kept to the minimum; existing one must rather be used than new ones created, if existing borrow pits are not suitable, and new ones are required an application must be lodged with DMR for permitting of such borrow pit.	• Contractor and ECO	• As required
Harvesting of medicinal plants and wood	• Gas and electrical cooking facilities must be provided • Open fires must be discouraged and only used under controlled circumstance, as the area is prone to large fires on a regular basis • Medicinal plants rescued instead of being destroyed and rare or threatened species moved to nurseries for replanting after construction	• Contractor and ECO	• Daily
Alien vegetation	• Declared alien vegetation must be controlled and the spread thereof proactively managed	• Contractor and ECO	• Bi-Weekly, monitoring
Construction of access roads	• Where possible, existing routes into rugged terrain must be used and enhanced. • If the access roads are required to cross green fields (untransformed) areas, it is strongly recommended that the plants present be surveyed and collected for documentation. Medicinal plants rescued instead of being destroyed and rare or threatened species moved to nurseries for replanting after construction or used for rehabilitation in areas where construction activities had resulted in the significant loss of natural vegetation.	• Developer and Contractor	• Once-off, monitoring

12.2. FAUNA

ACTIVITY/ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	FREQUENCY
Loss of sensitive habitats units	• A sensitivity map must be used as a decision-making tool to guide the layout design of the proposed development - all wetland areas (including man-made areas), upland primary grassland, ridges and outcrops (irrespective of their surface area) are regarded as sensitive habitat units • Quartzite and dolerite grassland must be avoided to prevent unnecessary damage or disturbances • All recommendations and mitigation measures provided in the Ecological report must be adhered to.	• Contractor	• Weekly Monitoring
Disturbances caused during the construction phase	• Extent of the construction sites and access roads must be demarcated on site layout plans and must be restricted to disturbed areas or those identified with low conservation importance • The construction of "new" access roads must be limited, and existing roads must be used during the construction phase • Construction activities must be limited to daylight hours	• Contractor and ECO	• Once-off, monitoring
Increased hunting, poaching and removal of firewood	• Harvesting of firewood or any plant material (for medicinal or cultural purpose) during the construction phase is strictly prohibited • Open fires are strictly prohibited and only allowed at designated areas • Hunting/snaring is strictly prohibited • Intentional killing of any faunal species (in particular invertebrates and snakes) must be avoided by means of awareness programmes presented to the labour force • If any subterranean/fossorial reptile, scorpion or mammal species is recovered during the construction phase, this species must be relocated to the nearest area or natural open space with suitable habitat	• Contractor and ECO	• Daily
Loss of conservation important faunal species	• A sensitivity map must be used as a decision-making tool to guide the layout design of the proposed development - all wetland areas (including man-made	• Contractor and ECO	• Weekly, monitoring

ACTIVITY/ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	FREQUENCY
	areas), upland primary grassland, ridges and outcrops (irrespective of their surface area) are regarded as sensitive habitat units • Quartzite and dolerite grassland must be avoided to prevent unnecessary damage or disturbances • Hunting/snaring is strictly prohibited • Intentional killing of any faunal species (in particular invertebrates and snakes) must be avoided by means of awareness programmes presented to the labour force • If any subterranean/fossorial reptile, scorpion or mammal species is recovered during the construction phase, this species must be relocated to the nearest area or natural open space with suitable habitat		
Maintenance of the vegetation on the power line servitude	• Where possible, the servitude below the line must be left natural and is not allowed to be burned on an annual basis • Inspections must be carried out at regular intervals to identify areas where erosion is occurring. Appropriate remedial action, including the rehabilitation of eroded areas must be undertaken	• Developer	• As required
Disturbances associated with maintenance procedures	• Quartzite and dolerite grassland must be avoided to prevent unnecessary damage or disturbances • Where possible, the servitude below the line must be left natural and is not allowed to be burned on an annual basis • Inspections must be carried out at regular intervals to identify areas where erosion is occurring. Appropriate remedial action, including the rehabilitation of eroded areas must be undertaken	• ECO, Developer	• As required

12.3. AVI-FAUNA

ACTIVITY/ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	FREQUENCY
Loss of habitat and disturbances	• The construction sites must be confined to disturbed areas or those identified with low conservation importance • All road networks must be planned with care to minimize dissection or fragmentation of important avifaunal habitat type. Where possible, the use of existing roads is encouraged The construction sites must be confined to disturbed areas or those identified with low conservation importance • A natural buffer zone must be allowed between the line servitude and any wetland or other sensitive habitat type • All intact/primary grassland, wetland, river and drainage line crossings must by default be marked • Open fires are strictly prohibited and only allowed at designated areas	• Contractor and ECO	• Bi-Weekly, monitoring
Poaching and trade of birds	• Killing or poaching of any bird species (in particular cranes) must be avoided by means of awareness programmes presented to the labour force	• Contractor and ECO	• Daily, monitoring
Collisions	• Where the line crosses a wetland/river, the actual crossover span as well as one span on either side of the wetland/river/ must be marked • Anti-collision devices must be applied in a staggered fashion to the phase while alternating between black and white diverters. The maximum distance between the diverters must not exceed 5 m. • All devices must be applied in a staggered fashion to the phase while alternating between black and white diverters	• Developer and Contractor	• Once-off, as required and monitoring

ACTIVITY/ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	FREQUENCY
Electrocution	• It is recommended from an avifaunal perspective a "bird friendly" mono-pole design be used which poses little electrocution risk.	• Contractor, Developer	• Once-off, monitoring

12.4. VISUAL

ACTIVITY/ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	FREQUENCY
Impact on sense of place	• Avoid placing the proposed distribution line within nature reserves and conservation areas • Avoid tourism nodes where possible	• Developer	• Once-off
Visual Intrusion and reduction of open space	• Avoid placing the proposed distribution line within nature reserves and conservation areas • Careful consideration must be given to the type of towers to be used to ensure the least intrusive technology possible	• Developer and Contractor	• Once-off
Deposition of litter	• No litter, refuse, waste, rubble and builder's waste generated on the premises are to be placed, dumped or deposited on adjacent/surrounding properties including road verges, roads or public places and open spaces during or after the construction period of the proposed development. Refuse must be disposed of at a dumping site approved by the Council. Site cleaning and screening of storm water outlets is essential to prevent large debris from impacting on stream banks downstream of the site. Dustbins must be provided at strategic places within the construction area, and cleared at regular intervals as required to avoid overflow	• Contractor and ECO	• Weekly

ACTIVITY/ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	FREQUENCY
Night light	• Security lights in the construction camp are to be angled downwards and into the centre of the site to avoid disturbance to adjoining residents. No tall lighting masts are to be erected or operated during the construction or operational phases	• Contractor	• Continuous

12.5. HERITAGE

ACTIVITY/ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	FREQUENCY
Impact on heritage resources	• Impacts of power lines on heritage can easily be avoided through spanning the electrical cables or conductors over the identified heritage resources • The contractors and workers must be notified that heritage resources might be exposed during the construction work. • In the event where any heritage resources be exposed during excavation, work on the area where the heritage resources were discovered, must cease immediately and the Environmental Control Officer must be notified as soon as possible. • No construction camps, monopoles, access roads or borrow pits must be constructed on a heritage resources without the appropriate permits	• Developer, Contractor and ECO	• Monthly

13. CONCLUSION

This Environmental Management Programme must be used as an on-site reference document during all phases of this development, and auditing must take place in order to determine compliance with this EMPR. Parties responsible for transgression of this EMPR must be held responsible for any rehabilitation that must be undertaken. Parties responsible for environmental degradation through irresponsible behaviour / negligence must receive penalties.

The EIA process facilitated the identification of relevant and practical mitigation measures, which must be used by the construction team and ESKOM to draw up and respond to Tender documentation. It is thus key to this process that this document be included during tendering to allow all potential bidders for this work to seriously consider and cost for such mitigation. This will ensure that the document receives the necessary buy in that it requires from the outset of the project.

In order to have records of environmental incidences and the handling thereof, it is suggested that incidence logs (refer to **Appendix A**) be filled in by the Environmental Control Officer or Environmental Liaison Officer. The contract manager needs to be informed of such incidences and further actions need to be taken, must the need arise.

APPENDIX A: EMERGENCY INCIDENTS PLAN

ENVIRONMENTAL INCIDENT LOG				
Date	***Environmental Condition***	***Comments*** *(Include any possible explanations for current condition and possible responsible parties. Include photographs, records etc. if available)*	***Corrective Action Taken*** *(Give details and attach documentation as far as possible)*	***Signature***

APPENDIX B: REPORTING AND CORRECTING NON-CONFORMITY

COMPLAINTS RECORD SHEET	
DATE:	FILE REFERENCE NUMBER:
COMPLAINT RAISED BY:	
CAPACITY OF COMPLAINANT:	
COMPLAINT RECORDED BY:	
COMPLAINT:	
COMPLAINT RAISED BY:	
•	
ECO'S PROPOSED REMEDIAL ACTION	
•	
•	
ECO Signature: ……. Date:……..	SITE MANAGER Signature: ……. Date:……

APPENDIX C: DECLARATION OF UNDERSTANDING BY DEVELOPER, ENGINEER AND CONTRACTOR

DECLARATION OF UNDERSTANDING BY THE DEVELOPER

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Program for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2: _____