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**ENVIRONMENTAL MANAGEMENT PROGRAMME
REPORT FOR THE APPLICATION FOR
ENVIRONMENTAL AUTHORISATION & A WATER USE
LICENSE FOR THE MOROKA MAIN PIMVILLE 11KV
POWERLINE CONSTRUCTION IN THE CITY OF
JOHANNESBURG METROPOLITAN MUNICIPALITY**



May 2019

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1 INTRODUCTION

The Bill of Rights – Chapter 2 of the Constitution Act No. 108 of 1996, includes an environmental right (Section 24) according to which, “*everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation and the sustainable use of natural resources while promoting justifiable economic and social development*”. In addition, Section 28 of the National Environmental Management Act No 107 of 1998 (NEMA), requires, “*every person causing significant pollution or degradation of the environment, to take reasonable measures to prevent it from occurring, continuing or recurring*”. Therefore, in order to promote effective environmental management throughout the life-cycle of a project, it is important that management actions arising from Environmental Impact Assessments (EIAs) are clearly defined and translated into an Environmental Management Programme (EMPr) for the design, construction, operation and/or decommissioning phases of a project.

According to the Western Cape Department of Environmental Affairs and Development Planning (2005), an Environmental Management Programme (EMPr) can be defined as, “*an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the project are enhanced*”.

1.1 Purpose of the EMPr

The purpose of an EMPr is therefore to:-

- a) Encourage good management practices through planning and commitment to environmental issues;
- b) Define how the management of the environment is reported and performance evaluated;
- c) Provide rational and practical environmental guidelines to:
 - Minimise the extent of environmental impacts and to manage environmental impacts and where possible, to improve the condition of the environment;
 - Prevent long-term or permanent environmental degradation.
 - Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment;
 - Provide guidance regarding method statements which are required to be implemented to achieve environmental specifications;
 - Define the corrective actions which must be taken in the event of non-compliance with the specifications of the EMPr;
 - Describe all monitoring procedures required to identify impacts on the environment, and;

- Train employees and contractors with regard to environmental obligations.

1.2 Project Location

The project is located in Pimvill, Soweto. The servitude of the powerline traverse two wards namely Ward 33 and Ward 37 and is between Elias Motsoaledi Road and Klipspruit Valley Road as illustrated in Figure 1.



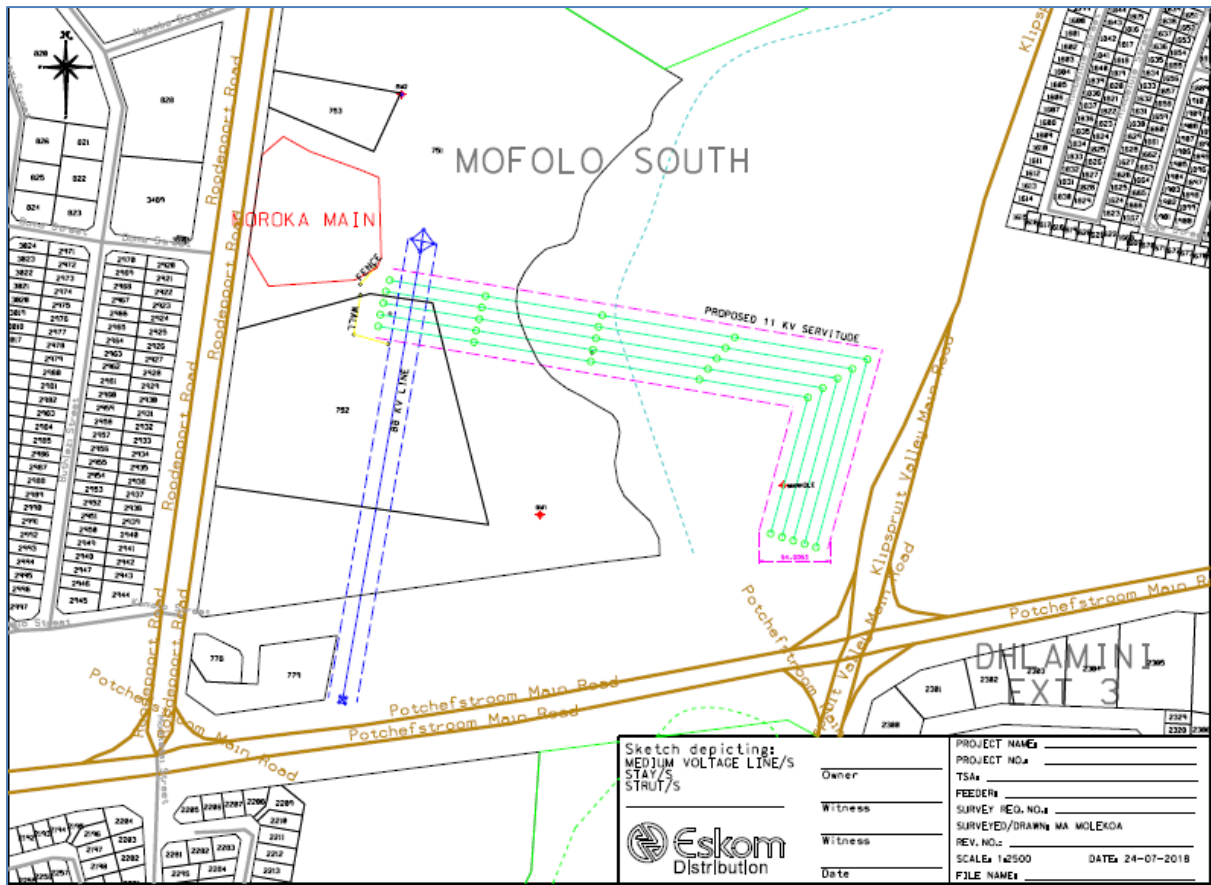


Figure 1: Site Location

2 Project Description

The development will comprise the decommissioning of existing 11kV cables and replace them with 10 x 11kV overhead powerlines on a 55m wide servitude on an approximately 600metres length running from Moroka main substation. Structure D-DT-1963a is proposed for construction on the project as illustrated in Figure 2.

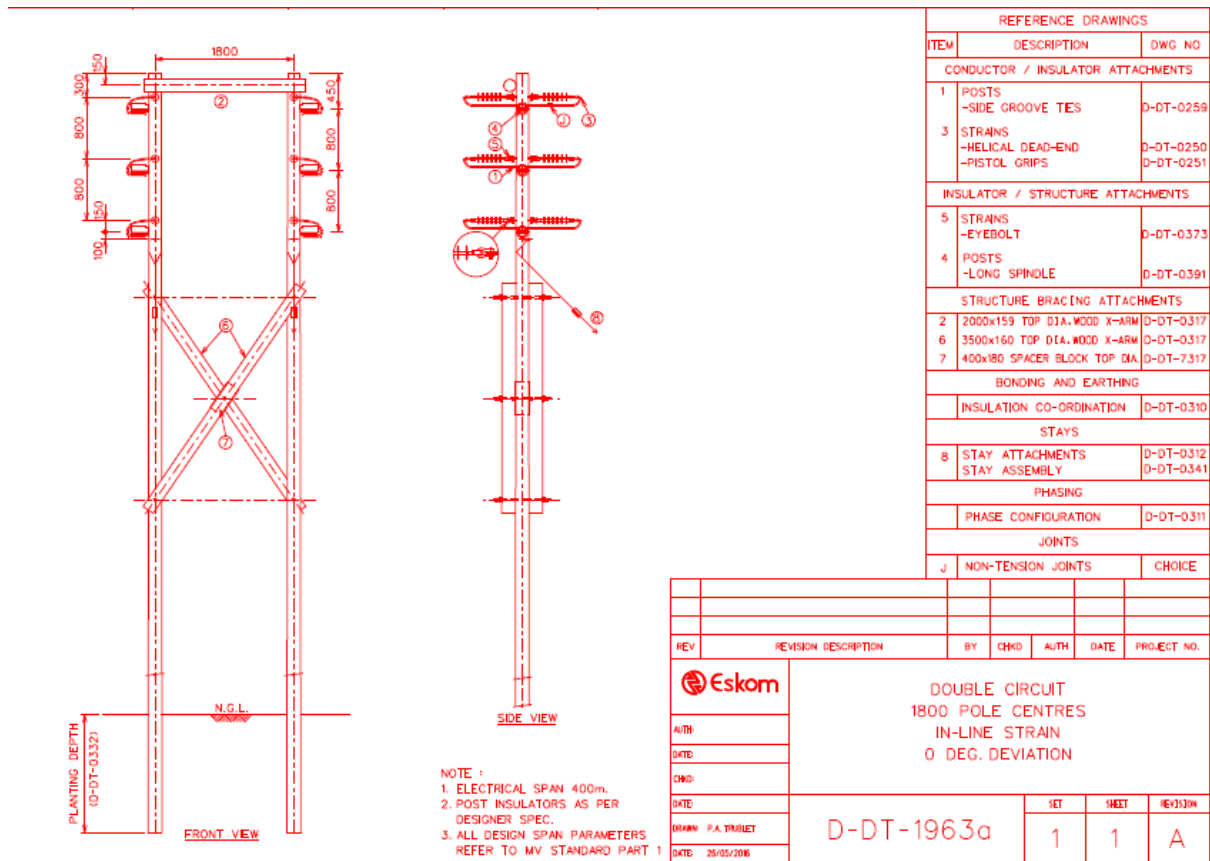


Figure 2: D-DT-1963a design structure

2.1 Decommissioning of Underground Cables

2.1.1 Excavations

- Excavate the trenches to a width sufficient for satisfactory and safe working conditions and shall comply with all relevant Acts, Regulations and requirements of public or statutory authorities.
- Excavate as necessary to provide the specified minimum cover, including joints, but so as to avoid damage or loss of support to, obstacles such as pipes, drains, cables and other utilities and services.
- Restore the area to be excavated to its original condition when the excavation is complete. All excavations shall be completed in a timely manner to minimise disruption to all parties.
- Provide all materials required for the excavation including, but not limited to pumping equipment, shoring, backfill, etc. The equipment must be provided for the entirety of the project

2.1.2 Compaction

Spoil or other approved filling shall be carefully placed in the trench. Stones, rocks and paving material shall be removed. Backfilling shall be carried out so as to avoid future subsidence. In all

other cases the backfilled material shall be compacted to the same density as the surrounding soil (Omodei, 2017)

3 LEGISLATIVE FRAMEWORK

3.1 Environmental Policy

The Contractor is required to compile an environmental management policy, which must consider the following:

- a) The Contractor's mission, vision and core values;
- b) Guiding principles;
- c) Requirements of, and communication with interested and affected parties (I&APs);
- d) The need to work towards continual improvement;
- e) The obligation to prevent pollution and ecological degradation;
- f) The importance of coordination with other organisational policies (e.g. quality, occupational health and safety, etc.);
- g) Reference to specific local and/or regional conditions; and
- h) A commitment to compliance with relevant environmental laws, regulations, by-laws and other criteria to which the Contractor subscribes.

3.2 Legislative Framework

Construction must be according to the best industry practices, as identified in the project documents. This EMPr, which forms an integral part of the contract documents, informs the contractor as to his duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of environmental impacts caused by construction activities associated with the project. The Contractor should note that obligations imposed by the EMPr are legally binding in terms of environmental statutory legislation and in terms of the additional conditions to the general conditions of contract that pertain to this project. In the event that any rights and obligations contained in this document contradict those specified in the standard or project specifications then the latter shall prevail.

3.2.1 Statutory and Other Applicable Legislation and Standards

The Contractor shall identify and comply with all South African national and provincial environmental legislation, including associated regulations and all local by-laws relevant to the project. Key legislation currently applicable to the design, construction and implementation phases of the project must be complied with. The list of applicable legislation provided below is intended to serve as a guideline only and is not exhaustive:-

- a) The Constitution of the Republic of South Africa Act 108 of 1996

- b) National Environmental Management Act 107 of 1998
- c) National Environmental Management: Protected Areas Act 57 of 2003
- d) National Environmental Management: Biodiversity Act 10 of 2004
- e) National Water Act 36 of 1998
- f) Hazardous Substances Act 15 of 1973
- g) National Heritage Resources Act 25 of 1999
- h) Atmospheric Pollution Prevention Act 45 of 1965
- i) National Environmental Management: Air Quality Act 39 of 2004
- j) National Environmental Management: Waste Management Act 59 of 2008
- k) Occupational Health and Safety Act 85 of 1993
- l) South African National Roads Agency Limited Act 7 of 1998
- m) All relevant provincial legislation, Municipal by-laws and ordinances.

4 ADMINISTRATION AND REGULATION OF ENVIRONMENTAL OBLIGATIONS

4.1 Management Structure

The Contractor must compile an organogram illustrating the management structure for inclusion within the final EMPr. This organogram should depict the organisation structure of the Contractor, and must contain supporting documentation to demonstrate the environmental responsibilities, accountability and liability of the Contractor's employees. The Contractor should assign responsibilities for the following:

- a) Reporting structures.
- b) Actions to be taken to ensure compliance.
- c) Overall design, development and implementation of the EMPr.
- d) Documenting the environmental policy and strategy.
- e) Implementing the EMPr in all stages/phases of the project.
- f) All the aspects which require action under the other core elements and sub-elements of the EMPr.

All official communication and reporting lines including instructions, directives and information shall be channelled according to the organisation structure.

4.2 Roles and Responsibilities

4.2.1 Eskom

Eskom is the client and will therefore be the entity monitoring the implementation of the EMPr. However, if Eskom appoints a Contractor to implement the project and hence implement the proposed mitigation measures documented in this EMPr on their behalf, then the successful contractor's responsibilities are outlined in Section 4.2.2 that follows.

4.2.2 Contractor

The successful Contractor shall:

- a) Be responsible for the overall implementation of the EMPr in accordance with the requirements of Eskom;
- b) Ensure that all third parties who carry out all or part of the Contractor's obligations under the Contract comply with the requirements of this EMPr

4.2.3 Designated Environmental Officer

The Contractor shall appoint a nominated representative of the contractor as the Designated Environmental Officer (DEO) for the contract. The DEO will be site-based and shall be the responsible person for implementing the environmental provisions of the construction contract. There shall be an approved DEO on the site at all times.

The DEO's duties will include, *inter alia*, the following:

- a) Ensuring that all the permits required in terms of the applicable legislation have been obtained prior to construction commencing.
- b) Reviewing and approving construction method statements with input from the ECO and Engineer, where necessary, in order to ensure that the environmental specifications contained within the construction contract are adhered to.
- c) Assisting the Contractor in finding environmentally responsible solutions to problems.
- d) Keeping accurate and detailed records of all activities on site.
- e) Keeping a register of complaints on site and recording community comments and issues, and the actions taken in response to these complaints.
- f) Ensuring that the required actions are undertaken to mitigate the impacts resulting from non-compliance.
- g) Reporting all incidences of non-compliance to the ECO and Contractor.

The DEO shall submit regular written reports to the ECO, but not less frequently than once a month.

The DEO must have:

- a) The ability to manage public communication and complaints;

- b) The ability to think holistically about the structure, functioning and performance of environmental systems; and
- c) The DEO must be fully conversant with the Environmental Management Programme and all relevant environmental legislation.

The ECO shall have the authority to instruct the contractor to replace the DEO if, in the ECO's opinion, the appointed officer is not fulfilling his/her duties in terms of the requirements of the construction contract. Such instruction will be in writing and shall clearly set out the reasons why a replacement is required and within what timeframe.

4.2.4 Environmental Control Officer

For the purposes of implementing the conditions contained herein, Eskom shall appoint an Environmental Control Officer (ECO) for the contract. The ECO shall be the responsible person for ensuring that the provisions of the EMPr are complied with. The ECO will be responsible for issuing instructions to the contractor and where environmental considerations call for action to be taken. The ECO shall submit regular written reports to ESKOM, but not less frequently than once a month. The ECO will be responsible for the monitoring, reviewing and verifying of compliance with the EMPr by the Contractor. The ECO's duties in this regard will include, *inter alia*, the following:

- a) Confirming that all the environmental permits required in terms of the applicable legislation have been obtained prior to construction commencing.
- b) Monitoring and verifying that the EMPr and Contract are adhered to at all times and taking action if specifications are not followed.
- c) Monitoring and verifying that environmental impacts are kept to a minimum.
- d) Reviewing and approving construction method statements with input from the DEO and Engineer, where necessary, in order to ensure that the environmental specifications contained within this EMPr are adhered to.
- e) Inspecting the site and surrounding areas on a regular basis regarding compliance with the EMPr and Contract.
- f) Monitoring the undertaking by the Contractor of environmental awareness training for all new personnel on site.
- g) Ensuring that activities on site comply with all relevant environmental legislation.
- h) Ordering the removal of, or issuing spot fines for person/s and/or equipment not complying with the specifications of the EMPr.
- i) Undertaking a continual internal review of the EMPr and submitting any changes to ESKOM for review and approval.

- j) Checking the register of complaints kept on site and maintained by the DEO and ensuring that the correct actions are/were taken in response to these complaints.
- k) Checking that the required actions are/were undertaken to mitigate the impacts resulting from non-compliance.
- l) Reporting all incidences of non-compliance to the ESKOM.
- m) Conducting annual environmental performance audits in respect of the activities undertaken relating to the project.
- n) Keeping a photographic record of progress on site from an environmental perspective.
- o) Recommending additional environmental protection measures, should this be necessary.
- p) Providing report back on any environmental issues at site meetings

The ECO must have:

- a) A good working knowledge of all relevant environmental policies, legislation, guidelines and standards;
- b) The ability to conduct inspections and audits and to produce thorough, readable and informative reports;
- c) The ability to manage public communication and complaints;
- d) The ability to think holistically about the structure, functioning and performance of environmental systems; and
- e) Proven competence in the application of the following integrated environmental management tools:
 - Environmental Impact Assessment.
 - Environmental management plans/programmes.
 - Environmental auditing.
 - Mitigation and optimisation of impacts.
 - Monitoring and evaluation of impacts.
 - Environmental Management Systems.

The ECO must be fully conversant with the Environmental Management Programme and all relevant environmental legislation. ESKOM shall have the authority to replace the ECO if, in their opinion, the appointed officer is not fulfilling his/her duties in terms of the requirements of the EMPR or this specification. Such instruction will be in writing and shall clearly set out the reasons why a replacement is required and within what timeframe.

4.2.5 Traffic Safety Officer

The Contractor shall nominate knowledgeable members of staff on site who shall be the responsible persons for the arrangement and maintenance of all traffic accommodation measures

required for the duration of the contract. The Traffic Safety Officer shall liaise with the DEO and/or ECO in order to ensure adequate and appropriate traffic arrangements.

4.3 Emergency Preparedness

The Contractor shall compile and maintain environmental emergency procedures to ensure that there will be an appropriate response to unexpected or accidental actions or incidents that will cause environmental impacts, throughout the life cycle of the project. Such activities may include, *inter alia*:

- a) Accidental discharges to water and land.
- b) Accidental exposure of employees to hazardous substances.
- c) Accidental veld or forest fires.
- d) Accidental spillage of hazardous substances.
- e) Accidental toxic emissions into the air (e.g. at asphalt plants if there will be any).
- f) Specific environmental and ecosystem effects from accidental releases or incidents.

These plans should include:

- a) Emergency organisation (manpower) and responsibilities, accountability and liability.
- b) A list of key personnel.
- c) Details of emergency services applicable to the various areas along the route (e.g. the fire department, spill clean-up services, etc.).
- d) Internal and external communication plans, including prescribed reporting procedures where required by legislation.
- e) Actions to be taken in the event of different types of emergencies.
- f) Incident recording, progress reporting and remediation measures required to be implemented.
- g) Information on hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release.
- h) Training plans, testing exercises and schedules for effectiveness.

The Contractor shall comply with the emergency preparedness and incident and accident-reporting requirements, as required by the Occupational Health and Safety Act, 1993 (Act No 85 of 1993), the National Environmental Management Act, 1998 (Act No 107 of 1998), the National Water Act, 1998 (Act No 36 of 1998) and the National Veld and Forest Fire Act, 1998 (Act No 101 of 1998) as amended and/or any other relevant legislation.

4.4 Checking and Corrective Action

4.4.1 Non-Compliance

Non-compliance with the specifications of the EMPr and/or conditions of any environmental permits, both of which will be present on-site at all times, constitutes a breach of Contract for which the Contractor may be liable to pay penalties. The Contractor is deemed not to have complied with the EMPr if:

- a) There is evidence of contravention of the EMPr specifications within the boundaries of the construction site, site extensions and haul/access roads;
- b) There is contravention of the EMPr specifications which relate to activities outside the boundaries of the construction site.
- c) Environmental damage ensues due to negligence;
- d) Construction activities take place outside the defined boundaries of the site; and/or
- e) The Contractor fails to comply with corrective or other instructions issued by the Engineer and/or ECO within a specific time period.

The contractor shall act immediately when a notice of non-compliance is received and correct whatever was the cause for the issuing of the notice.

Any non-compliance with the agreed procedures of the EMPr is a transgression of the various statutes and laws that define the manner by which the environment is managed therefore any avoidable non-compliance, dependant on severity, shall be considered sufficient grounds for contact to be made with relevant provincial or national authorities.

The engineer's decision with regard to what is considered a violation, its seriousness and the action to be taken against the contractor shall be final. Failure to redress the cause shall be reported to the relevant authority. The responsible provincial or national authorities shall ensure compliance and impose penalties relevant to the transgression as allowed for within its statutory powers.

4.4.2 Monitoring

A monitoring programme will be implemented for the duration of the construction phase of the project. This programme will include:

- **Performance Audits:** Monthly inspection reports which are performance based compiled by the ECO. This must also incorporate monitoring of compliance issues as well as permits, licenses, the EMPr and all contract documentation's conditions. These audits can be conducted randomly and do not require prior arrangement with the project manager.

- **Compliance Audits:** The auditor will initially undertake compliance audits every month. Compilation of an audit report with a rating of the compliance with the EMP. This report will be submitted to the relevant authorities as and when required

The following will also assist with monitoring:-

Complaints Register

The Contractor will ensure that a dedicated Complaints Register is kept on site at all times. The register will contain the details of the person who made the complaint, the nature of the complaint received, the date on which the complaint was made and the response noted with the date and action taken. The Complaints register will be kept in accordance with the requirements of the ECO. This record shall be submitted with the monthly reports and an oral report given at the monthly site meetings.

Inspections

On-going visual inspections will be conducted daily by the DEO. The DEO will spend the bulk of his/her time on site on the lookout for any unsafe acts and activities that transgress the requirements as specified in the EMP. The DEO compiles the site register and the ECO maintains the complaints register and any other records required (the DEO would also have input into this as well, as he/she would be site-based).

Incident Reporting and Remedy

If a leakage or spillage of hazardous substances occurs on site, the local emergency services must be immediately notified of the incident (within 24 hours). The following information must be provided:

- a) The location;
- b) The nature of the load; and
- c) The status at the site of the accident itself (i.e. whether further leakage is still taking place, whether the vehicle or the load is on fire).

Written records must be kept on the corrective and remedial measures decided upon and the progress achieved therewith over time. Such progress reporting is important for monitoring and auditing purposes. The written reports may be used for training purposes in an effort to prevent similar future occurrences.

Public Communication and Liaison with Interested and Affected Parties

The Contractor shall comply with the requirements for public consultation as required by the Constitution Act, 1996 (Act No 108 of 1996) and the National Environmental Management Act, 1998 (Act No 107 of 1998). During the construction phase of the project, the Contractor shall be

responsible for erecting information boards, in the position, quantity, design and dimensions approved by the Engineer.

The information boards shall contain relevant information regarding the construction activity and the relevant contact details to assist persons who wish to submit complaints regarding construction activities.

Information distribution

Copies of the EMPr will be made available to I&APs at appropriate locations. Copies will also be distributed to all senior contract personnel. All senior personnel on the construction site will be required to familiarize themselves with the contents of the document.

4.5 Management Review

A formal management review needs to be conducted on a regular basis in which the monthly internal audit reports written by the ECO and based on frequent inspections and interactions with the DEO based on the latter's daily reports, audit reports by the independent external auditor will be reviewed. The purpose of the review is to critically examine the effectiveness of the EMPr and its implementation and to decide on potential modifications to the EMPr as and when necessary. The process of management review is in keeping with the principle of continual improvement. Management review will take place monthly for the duration of the project.

5 DETAILED ENVIRONMENTAL MANAGEMENT PROGRAMME

The EMPr forms part of the Contract Documentation and is thus a legally binding document. It is also necessary for the Contractor to make provisions as part of their budgets for the implementation of the EMPr. In terms of the NEMA an individual responsible for environmental damage must pay costs both to the environment and human health and the preventative measures to reduce or prevent additional pollution and/or environmental damage from occurring. This is referred to as the Polluter Pays Principle. Section 28 of the NEMA embodies the Polluter Pays Principle. The Contractor is deemed not to have complied with the Environmental Specifications/EMPr if:

- a) There is evidence of contravention of clauses within the boundaries of the site, site extensions and haul /access roads;
- b) Environmental damage ensues due to negligence;
- c) The Contractor ignores or fails to comply with corrective or other instructions issued by ESKOM, the Engineer or ECO within a specified time; and
- d) The Contractor fails to respond adequately to complaints from the public.

5.1 Pre-Construction Phase

5.1.1 Permits and Licenses

All necessary permits and licences must be obtained by ESKOM prior to the commencement of construction

5.1.2 Appointment of Contractor

- a) ESKOM must ensure that this EMPr forms part of any Contractual agreements with the Contractor(s) and sub-Contractors for the execution of the proposed project. The Contractor must make adequate provision in their budgets for the implementation of the EMPr.
- b) The Principal Contractor (including sub-Contractors and suppliers) must comply with the relevant provisions of the EMPr, applicable environmental legislation, by-laws and associated regulations promulgated in terms of these laws.
- c) Tender documents should include statements to include the use of local communities or local community organisation where possible in supplying services and labour to the construction activities.
- d) Local labourers should be used for such methods

5.1.3 Preparation of Method Statements

- a) Method Statements must be submitted by the Contractor to the ECO and must be adhered to by the Contractor and Project Engineer for the duration of the Project. These relate to water and storm water management requirements, traffic requirements, solid waste management requirements, fuel storage and filling and dispensing of fuel (diesel and petrol), hydrocarbon spills, contaminated water treatment, the storage of hazardous materials, standard emergency procedures, and biohazard control, and any further activities which the ECO and Project Engineer deem necessary.
- b) The ECO will monitor the implementation of the Method Statements. All copies of the statements and plans must be submitted to the appointed ECO.

5.1.4 Project Required Method Statements

a) Working within watercourses

As part of the finalisation of the EMPr, detailed Method Statements must be compiled for all construction activities confirmed to occur within the watercourses. The Method Statements must provide detail on the following, where applicable:

- a) Working area extent and demarcation;
- b) Vegetation and soil clearing / grubbing / stripping and stockpiling;
- c) Access and running track establishment and decommissioning;

- d) Method of excavation;
- e) Temporary flow diversion measures;
- f) Infrastructure placement measures; and
- g) Rehabilitation – reshaping, soil preparation, stabilisation / erosion control and revegetation

5.2 Construction Phase

5.2.1 Site Establishment

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	The Contractor shall make all efforts to establish their construction camps, offices, workshops and any other infrastructure in previously impacted areas and in a manner that does not adversely affect the environment.	Contractor; ESKOM
2	Prior to the establishment of the site camp/office, the Contractor will produce a site layout plan showing the positions of all equipment storage, waste stockpiling, fuel storage areas and other infrastructure for approval of the ECO and Project Engineer.	
3	The construction area must be clearly demarcated on the layout plan, and all other areas (in particular the wetland and associated buffer) must be considered no-go areas for the construction personnel.	
4	Adequate signage must be placed in the area where construction will take place informing the public of the activities taking place	
5	The site must be secured and manned on a 24 hour basis	
6	The Contractor must take responsibility for the site to conform to all Contractual aspects and environmental standards applicable.	
7	The Contractor must provide adequate refuse bins that must be cleaned / emptied and the waste removed from site on a regular basis	
8	The construction camp must be kept in an orderly state at all times	

9	Vegetation removed for the site establishment is to be kept to a minimum. No trees are to be removed, if possible, with the exception of alien weeds and invader plants.	
10	The construction camp is to be located a minimum horizontal distance of 100 m from any wetlands and rivers identified onsite and its associated buffer and above the 1:100 year flood line	
11	The Contractor must ensure that drainage on the camp site is such to prevent standing water and/or sheet erosion from taking place	
12	It is recommended that a Contractor should comply with the following parameters: a) The Contractor or DEO appointed by the Contractor must have the necessary knowledge to be able to identify protected species as well as species not interfering with the operation. b) The Contractor must also be able to identify declared weeds and alien species that can be totally eradicated. c) Only vegetation that could potentially threaten the development in terms of clearance and fire risk must be cleared, provided the necessary permits are available if any protected species are affected	
13	No equipment laydown or storage areas must be located within 50m of any watercourse and/or within the 1:100 year flood line.	Contractor

5.2.2 Ablution /Sanitation Facilities

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	A minimum of one chemical toilet must be provided per 10 persons.	Contractor and ESKOM
2	The chemical toilets must be strategically placed (easily accessible to workers, preferably no more than a 300 m from the work face) and will not be situated within any watercourse, or within the wetland or associated buffer	
3	Chemical toilets must be secure, clean and functional throughout the project life cycle.	
4	All ablution activities must take place in these facilities, and waste material must be stored and disposed of at the registered waste disposal site or collected by a suitable waste Contractor on a regular basis. A waste disposal certificate must be kept in the Environmental file on Site	
5	The Contractor must ensure that toilets are cleaned or emptied regularly and that no spillage occurs during routine maintenance	
6	All temporary/portable toilets must be secured to the ground to prevent them from toppling due to wind or any other cause	
7	Unauthorised dumping / spilling of waste from toilets into the environment and burying of waste are strictly prohibited	

5.2.3 Demarcations and No-go Areas

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	At watercourse crossing, the outer edge of the construction servitude/working area/corridor as defined above must be clearly demarcated for the entire construction phase using plastic orange bonnox fencing. All areas outside of this demarcated corridor must be considered 'No-go areas'.	Contractor and ESKOM
2	Under no circumstances must any watercourse be impacted by temporary access roads. In this regard, all temporary access routes to construction site camps/equipment lay-down areas must be agreed upon by the Environmental Control Officer (ECO) and the outer edge of the access route must be staked out by the Contractor using brightly coloured stakes prior to the access route being used by machinery	
3	All demarcation work must be signed off by the ECO before any work commences.	
4	Any Contractors found working inside the 'no-go' areas (areas outside the working servitude) should be fined as per fining schedule/system setup for the project.	

5.2.4 Plant Maintenance

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	Heavy machinery and construction vehicles are to be stored in a vehicle maintenance yard which must be illustrated on the construction camp layout map.	Contractor and ESKOM
2	A dedicated maintenance area must be demarcated with an impermeable surface leading to an oil-water separator. No vehicle may be extensively repaired in any place other than in the dedicated maintenance yard.	
3	Washing of vehicles is prohibited on site or at the Construction Camp and Vehicle Maintenance Yard.	
4	Access of all maintenance and material delivery vehicles must be strictly controlled.	
5	Vehicles and equipment must be serviced regularly to avoid the contamination of the area from oil and hydraulic fluid leaks etc.	
6	Servicing of vehicles must be done off-site or in a dedicated service bay which is impermeable, bund and is equipped with spill kit material.	
7	Machinery or equipment used on site must not constitute a pollution hazard in respect of the above substances	
8	The Contractor must order such equipment to be repaired or withdraw from use if they consider the equipment or machinery to be polluting and irreparable.	

9	Suitably covered receptacles must be available at all times and conveniently placed for the disposal of waste. All used oils, grease or hydraulic fluids must be placed therein and these receptacles will be removed from the site on a regular basis for disposal at a registered or licensed disposal facility	
10	All speed limits must be adhered to	

5.2.5 Hazardous and General Substances and Materials

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	Storage areas must not be within 100m of the edge of the buffer around the wetland or within 100m of a watercourse	Contractor and ESKOM
2	No refuelling, servicing or chemical storage should occur within 50m of the delineated wetland/aquatic habitat or within the 100-year flood line, whichever is applicable	
3	Storage areas must be designated, demarcated and fenced	
4	Hazardous Substance Storage areas should be secured, under lock and key, so as to minimise the risk of crime	
5	Fire prevention facilities must be present at all storage facilities	
6	Appropriate storage facilities for the storage of oils, paints, grease, fuels, chemicals and any hazardous materials to be used must be provided to prevent the migration of spillage into the ground and groundwater, around the storage area(s). These pollution prevention measures for storage should include a bund wall high enough to contain at least 110% of any stored volume. Such a facility must be on an impervious surface. The storage area must be securely fenced and all hazardous substances such as fuel, oils, chemicals, etc., must be stored therein. Drip trays, a thin concrete slab or a facility with PVC lining, must be installed in such storage areas with a view to prevent soil and water pollution	
7	Any water that collects in the bund must not be allowed to stand and must be removed immediately	

8	All fuel storage tanks and associated facilities must be designed and installed in accordance with the relevant oil industry standards, SANS codes and other relevant requirements.	
9	Symbolic safety signs depicting No Smoking, No Naked Flames and Danger are to be prominently displayed in and around the fuel storage area.	
10	The capacity of the tank must be clearly displayed and the product contained within the tank clearly identified	
11	Only empty and externally clean tanks may be stored on the bare ground. All empty and externally dirty tanks must be sealed and stored in an area where the ground has been protected.	
12	If fuel is dispensed from 200 litre drums, the proper dispensing equipment must be used and accompanied by a drip tray.	
13	The drum must not be tipped in order to dispense fuel. The dispensing mechanism of the fuel storage tank must be stored in a waterproof container when not in use	
14	All waste fuel and chemical contaminated rags must be stored in leak-proof containers and disposed of at an approved hazardous waste site. Safe disposal certificates (SDCs) must be obtained for any hazardous wastes which are disposed of and such documentation must be maintained for record-keeping purposes on site.	
15	Storage sites will be provided with bunds to contain any spilled liquids and materials. These storage facilities (including any tanks) must be on an impermeable surface that is protected from the ingress of Storm water from surrounding areas	

	in order to ensure that accidental spillage does not pollute local soil or water resources	
16	Material Safety Data Sheets (MSDSs) must be readily available on site for all chemicals and hazardous substances to be used on site. Where possible the available, MSDSs should additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases or spillages	
17	Staff dealing with these materials / substances must be aware of their potential impacts and follow the appropriate safety measures	
18	A suitable Waste Disposal Contractor must be employed to remove waste oil. These wastes must only be disposed of at licensed landfill sites designed to handle hazardous waste. Appropriate Safety Disposal Certificates must be provided for all hazardous waste being disposed of.	
19	The Contractor must ensure that his staff are made aware of the health risks associated with any hazardous substances used and has been provided with the appropriate protective clothing/equipment in case of spillages or accidents and have received the necessary training	
20	Cement / concrete must not be mixed directly on the ground. Mixing trays and/or impermeable sumps must be used at all mixing and supply points. Unused cement bags are to be stored so as not to be effected by rain or runoff events.	
21	The washing of concrete trucks on site is prohibited unless disposed of into a designated wash area approved by the ECO.	

22	Used cement bags must be stored in weather-proof containers to prevent windblown cement dust and water contamination. Used cement bags must be disposed of on a regular basis via the solid waste management system, and must not be used for any other purpose.	
23	All visible remains of excess concrete must be physically removed on completion of the plaster or concrete pour section and disposed of. Washing the remains into the ground is not acceptable as groundwater contamination could occur.	
24	No paint products may be disposed of on site	
25	Care should be taken of the storage thresholds contained in the EIA Regulations (2014) Listing Notices as well as the Waste Management Activities contained in Category A and B.	
26	The Contractor must maintain a record of the sourcing of all materials used during construction	

5.2.6 Spills, Incidents and Pollution Control

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	Any spillage, which may occur, must be investigated and immediate action must be taken according to the requirements of the Spill Contingency Plan. This must also be reported to the ECO and Site Manager	Contractor and ESKOM
2	In the case of a spill of hydrocarbons, chemicals or bituminous material in the Construction camp or on the construction site/ bunding area, the spill should be contained and cleaned up and the material together with any contaminated soil collected and disposed of as hazardous waste to minimize pollution risk and reduce bunding capacity	
3	Should a pollution incident occur on site the Contractor must: a) Implement reasonable measures immediately to contain and minimise the impacts of the incident; b) Notify all persons whose health may be affected by the incident; c) Undertake clean up procedures immediately; d) Notify the Contractor of the incident immediately who will advise the employee as to the measures that should be implemented; e) Record the incident in the Environmental Incident Register; and f) Implement measures to prevent similar incidents from occurring in the future.	
4	Concrete mixing must be confined to as few areas as possible and ad hoc mixing is to be avoided. Areas where concrete was mixed must be cleaned up after use. Concrete mixing is to be undertaken on an impervious surface.	

5	Soil and construction material stockpiles are to be bermed to prevent leachate and polluted runoff	
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5.2.7 Emergency Preparedness

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	A fire mitigation and prevention plan should be drafted before construction to ensure preparedness toward preventing fires starting from construction or elsewhere to limit or prevent damage to neighbouring grazing that the community depends on. The fire management plan must specify specifically how fires will be prevented from frequently breaking out and causing damage to the surrounding vegetation during construction. Excessive fires could have a negative effect on vegetation in the area	Contractor
2	Permits shall be obtained from the relevant Heritage Resources Agency for the removal of any Cultural or Heritage Artefacts.	
3	Cultural and Heritage Artefacts Local museums as well as the relevant Heritage Resource Agency should be informed if any artefacts are uncovered in the affected area and mitigation measures recommended by SAHRA should be followed.	
4	The Contractor must take reasonable precautions to prevent any person from removing or damaging any such article and must immediately, upon discovery thereof, inform the Site Manager of such discovery which in turn must contact a registered archaeologist	
5	Work may only resume once clearance is given in writing by the archaeologist	

5.2.8 Noise Control

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	Neighbouring landowners must be notified about construction activities	Contractor and ESKOM
2	All construction vehicles and equipment are to be kept in good repair and must be fitted with standard silencers prior to construction.	
3	Where possible, stationary noisy equipment (for example compressors, generators etc. must be encapsulated in acoustic covers, screens or sheds. Portable acoustic shields must be used in the case where noisy equipment is not stationary (for example drills, angle grinders, chipping hammers).	
4	Construction activities, and particularly the excessively noisy activities, are to be contained to reasonable hours during the day and early evening.	
5	Machines in intermittent use must be shut down in the intervening periods between work activities or throttled down to a minimum.	
6	In general, operations must meet the noise standard requirements of the Occupational Health and Safety Act (Act No 85 of 1993).	
7	Construction staff working in areas where the 8-hour ambient noise levels exceed 75dBA must wear ear protection equipment.	
8	Noise levels must be kept within acceptable limits. All noise and sounds generated must adhere to SANS	
9	SANS 10103 specifications for maximum allowable noise levels for central business districts. No pure tone sirens or hooters may be utilised except where required in terms of SANS standards or in emergencies	

10	Noisy operations must be combined so that they occur where possible at the same time	
11	Noise from the workforce must be controlled	
12	Noise suppression measures must be applied to all construction equipment. Construction equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the Contractor may be instructed to remove the offending vehicle or machinery from site.	
13	The Contractor must take measures to discourage labourers from loitering in areas and causing noise disturbance. Where possible labour must be transported to and from the site by the Contractor or his subcontractors by the Contractors own transport	
14	Construction activities are to be contained to reasonable hours during normal working hours	
15	Neighbours are to be given at least three days warning prior to any blasting, piling or other 'noisy' activities	
16	No vendors or similar informal traders must be allowed to trade on the site.	

5.2.9 General Waste

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	General waste produced on site includes: <ul style="list-style-type: none"> a) Office waste (e.g. food, waste, paper, plastic); b) Operational waste (clean steel, wood, glass); and c) General domestic waste (food, cardboards, paper, bottles, tins). 	Contractor and ESKOM
2	An adequate number of general waste receptacles, including bins must be arranged around the Construction camp, on site to collect all domestic refuse, and to minimise littering.	
3	Bins must be clearly marked and lined for efficient control and safe disposal of waste.	
4	Different waste bins, for different waste streams must be provided to ensure correct waste separation	
5	A fenced area must be allocated for waste sorting and disposal on the site	
6	All waste receptacles must be appropriately covered to ensure waste does not affected by wind, rain or vermin.	
7	General waste produced on site is to be collected in skips for disposal at a registered landfill site. Hazardous waste is not to be mixed or combined with general waste earmarked for disposal at the municipal landfill site	
8	No general waste is to be disposed of at the spoil area	
9	Under no circumstances is waste to be burnt or buried on site. The excavation and use of rubbish pits on site is forbidden.	

10	Waste bins must be cleaned out on a regular basis to prevent any windblown waste and/or visual disturbance	
11	All general waste must be removed from the construction areas on a daily basis and disposed of in suitable waste receptacles at the Construction Camp	
12	The Contractor must ensure that all general waste is disposed of at an appropriately licensed waste disposal facility. Through exploring practical means for reducing, reusing and recycling waste generated in undertaking the activity, the Contractor must dispose of the minimum amount of waste possible.	

5.2.10 Hazardous Waste

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	Hazardous waste produced on site includes: <ul style="list-style-type: none"> a) Oil and other lubricants, diesel, paints, solvent; b) Containers that contained chemicals, oils or greases; and c) Equipment, steel, other material (rags), soils, gravel and water contaminated by hazardous substances (oil, fuel, grease, chemicals or bitumen). d) Or that which has been identified in Legislation 	Contractor and ESKOM
2	Hazardous waste is to be disposed of at a Licenced Hazardous Waste Landfill Site. The ECO must identify an approved waste disposal site at the inception of the project	
3	Hazardous waste bins must be clearly marked, stored in a contained area (or have a drip tray) and covered (either stored under a roof or the top of the container must be covered with a lid).	
4	A hazardous waste disposal certificate must be obtained from the waste removal company as evidence of correct disposal	

5.2.11 Wastewater

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	All wastewater generated from activities related to the site must be disposed of in a suitable manner so as not to cause any surface or subsurface water pollution or health hazard	Contractor and Eskom
2	Waste water including cement contaminated water must not enter any water course and must be managed by the site manager to ensure that the existing water resources on and off site are not polluted by activities emanating from the above development	
3	Contaminated wastewater including cement-contaminated water must not enter any watercourse and must be managed by the Contractor to ensure that the existing water resources on and off site are not polluted by activities emanating from the above development	

5.2.12 Dust Control

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	If water is abstracted from a water resource for dust suppression, a Water Use Licence/ General Authorisation must be obtained from the Department of Water Affairs.	Contractor and ESKOM
2	Dust should not reduce the visibility for private vehicles making use of the road passing by the site	
3	All construction vehicles and equipment are to be kept in good working order	
4	Speed limits of a maximum of 40 km/hr. are to be implemented on site and enforced by the Contractor	
5	Shade cloth fencing is to be used to reduce dust aggravation in high usage areas.	
6	Construction activities are to be contained to reasonable hours during the day avoiding periods of sunrise and sunset.	
7	In areas where there is a large potential for dust liberation (high wind days) wet suppression using a light spray should be applied to the areas in question.	
8	A dust suppression register as well as a complaints register needs to be kept	
9	All complaints received need to be investigated with remedial action taken communicated to the affected party within 14 days	

5.2.13 Topsoil Management

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	No soil stockpile areas must be located within 20m of any watercourse	Contractor and ESKOM
2	The Contractor must strip and stockpile all topsoil within the work area for subsequent use at a later stage	
3	Topsoil removed must be stockpiled in a designated area	
4	Stockpiles must be located outside of any identified wetland areas. Stockpiles must be protected from wind and rain with the use of tarpaulins where necessary. The Engineer is to use his discretion in this regard.	
5	Efforts must be taken to ensure that stockpiles do not erode and cause siltation into any wetlands and watercourses.	
6	Topsoil must be kept separate from overburden and must not be used for infilling	
7	Weeds must be eradicated from topsoil prior to spoiling	
8	Erosion/sediment control measures such as silt fences, low soil berms or wooden shutter boards must be placed around any stockpiles to limit sediment runoff from stockpiles	
9	Stockpiles of construction materials must be clearly separated from soil stockpiles in order to limit any contamination of soils	
10	The stockpiles may only be placed within demarcated stockpile areas, which must fall within the demarcated construction area. The Contractor shall, where possible, avoid stockpiling materials in vegetated areas that will not be cleared	
11	The slope and height of stockpiles must be limited to 2m to avoid collapse	

5.2.14 Spoil Material

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	Litter and general waste is to be removed from the soil and spoiling before stockpiling.	Contractor and ESKOM
2	Spoil sites will be shaped to fit the natural topography	
3	Spoil sites must receive a minimum of 75 mm topsoil and be grassed with a recommended indigenous seed mixture by a qualified ecologist	
4	Slopes must not exceed a vertical: horizontal ratio of 1:3.	

5.2.15 Soil Erosion

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	<p>Soil erosion on site must be prevented at all times, i.e. pre, during and post construction activities. Suitable erosion control measures must be implemented in areas sensitive to erosion such as water supply points and edges of slopes.</p> <p>These measures must include:</p> <ul style="list-style-type: none"> a) Phased construction activities must take place to ensure the removal of vegetation, only as it becomes necessary for work to proceed. This enables erosion and sedimentation to be minimised and centralised in relatively small areas easier to control and to stabilize. The storage of topsoil must remain for the shortest period of time possible after works have taken place. b) Vegetative Cover – vegetation reinforces soil and holds it in place thereby reducing erosion. Temporary or permanent vegetation must be planted on all bare soil immediately after any ground disturbance. The prompt rehabilitation of exposed soil areas with indigenous vegetation will ensure that soil is protected from the elements. The unnecessary removal of vegetation, especially on steep areas, must be prevented. c) Taking necessary precautions in terms of design, during construction, earthworks, and cutting and filling must be taken. Soil stockpiles must be vegetated or covered to reduce soil loss as a result of wind or water to 	Contractor and ESKOM

	<p>prevent erosion and sedimentation. Disturbed areas must be rehabilitated as soon as possible.</p> <p>d) Seeding, anchored mulch, wool binders or erosion control fabrics must be used to provide surface protection and stabilisation until vegetation is established.</p> <p>e) The suitable use of sand bags or Hessian sheets must be used to stabilise bare soil.</p> <p>f) The suitable use of geo-textiles, turf blankets or mats must be used as slope protection for exposed slopes.</p> <p>g) Proper drainage controls such as culverts and cut-off trenches must be used to ensure proper management of surface water runoff to prevent erosion and sedimentation.</p> <p>h) Construction vehicles must remain on designated demarcated areas.</p> <p>i) Work areas must be clearly defined and demarcated to avoid unnecessary disturbance of areas outside the maintenance area.</p>	
2	Constant cognisance of the inherent high erosion risk potential of all soils and sites on the property must be taken and appropriate control and preventative measure put in place.	Contractor and ESKOM
3	The spoil site must not be situated near or in a wetland and/or water course	
4	A signboard must be placed in the area where spoiling activities such as clearing and infilling will take place informing the public of the activities taking place.	
5	The Contractor must take responsibility for the site to conform to all Contractual aspects and environmental standards applicable	

6	The spoil site must be cleared of all inert waste, rubble, foundations and litter	
7	No large rocks or building rubble are permitted to be spoiled at these sites. If building rubble is to be spoiled, the necessary permits or licences are to be obtained	
8	Dumping of any other material, including litter is prohibited	
9	Spoil site should not be located within the 1:100 year flood line	
10	Litter and general waste is to be removed from the soil and spoiling before stockpiling.	
11	Spoil sites will be shaped to fit the natural topography	
12	Spoil sites must receive a minimum of 75 mm topsoil and be grassed with the recommended seed mixture	

5.2.16 Loss of Soil Fertility

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	Construction footprint to be demarcated as per the construction phase conditions in order to ensure that all construction activities remain within this footprint	Contractor and ESKOM
2	A regulated speed limit of ≤ 40 km per hour will be maintained to minimise dust generation during the construction activities	
3	All disturbed areas can be re-vegetated with an indigenous grass mix to re-establish a protective grass strip within the power line servitude to minimize soil erosion and dust emission	
4	Temporary erosion control measures will be used to protect the disturbed soils until adequate vegetation has established	
5	Disturbed soils can be lightly ripped to at least 25 cm to alleviate compaction prior to re-vegetation.	

5.2.17 Soil Contamination and Compaction

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	Eskom's spill prevention and emergency spill response plan, as well as dust suppression, and fire prevention plans will be implemented during the construction phase	Contractor and ESKOM
2	An Eskom emergency response contingency plan will be implemented to address clean-up measures should a spill and/or a leak occur	
3	Spill kits will be provided for onsite spill clearing	
4	All potential contaminants and hazardous substances (e.g. hydrocarbons, cement, waste collection and storage areas etc.) will be located on bunded areas to capture and spills and leaks	
5	Waste associated with construction phase activities will be stored and removed as per Eskom Environmental Management Policy and Environmental Management Programme	

5.2.18 Fauna, Flora and Ecology

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	Removing of vegetation must be restricted to the immediate area for construction and as instructed by Site Manager and ECO	Contractor/ECO/ Site Manager
2	The cleared vegetation must be disposed of to a suitable disposal site. The burning of vegetation cleared or disposal to adjacent site is prohibited	Contractor
3	Protected trees and species identified by a botanist or ECO may not be removed or cut without a permit from the relevant provincial Department	
4	Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas	
5	Where alien plants have been introduced on to the site during clearing and infilling, they must be removed immediately	
6	The Contractor must develop an Action Plan for the removal of alien invasive species and submit it to the ECO for approval	
7	Invader species and weeds must be removed and disposed of in accordance with existing legislation (Conservation of Agricultural Resource Act (No. 43 of 1983) on a regular basis	
8	The removal of indigenous/endemic shrubs and small trees must be kept to a minimum and only be removed if the necessary permits have been obtained.	
9	Any removal of any fauna and flora from site or surrounds is strictly prohibited	
10	Provision of adequate toilet facilities must be implemented to prevent the possible contamination of ground (borehole) water in the area. Mobile toilets	

	must be provided in order to minimise unauthorised traffic of construction workers outside of the designated areas	
11	Educational programmes for the Contractors' staff must be implemented to ensure that project workers are alerted to the possibility of snakes being found during vegetation clearance. The construction team must be briefed about the management of snakes and other dangerous animals on site. In particular, construction workers are to go through on-going refresher courses to ensure that snakes are not killed or injured when found	
12	No animal may be hunted, trapped, snared or captured for any purpose	
13	Speed of vehicles should be limited to avoid injury of fauna and allow for sufficient safety margins	Whole Project Team
14	Rehabilitation measures must be implemented in areas where the soil surface was disturbed as Alien and Invasive Plants will promoted by these activities and faunal habitat will be lost due to encroachment of these species	Contractor and ESKOM
15	Implementation of the appropriate measures included in Eskom's Transmission Vegetation Management Guideline, which include the relation of identified floral and obtain the relevant permits, if required	
16	No animals should be intentionally killed or destroyed and poaching should not be permitted on the site.	
17	Installation of bird flappers at delineated wetland areas. Special bird flappers will be installed on the power lines to deter birds from flying into the power lines	

5.2.19 Loss and Disturbance of Wetland Habitat Due to Clearing of Vegetation Along the Power Line Route

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	Vegetation clearing will be kept to the absolute minimum servitude required for safe operation of the power line	Contractor and ESKOM
2	Vegetation clearing will be limited to removal of alien trees and mowing of grass and reeds	
3	Complete removal of vegetation will be avoided, except in direct excavation footprints	
4	No driving through wetland/stream channels and saturated soils unless existing crossings are utilised	
5	Where new access tracks into wetlands will be made, the shortest possible route through the wetland will be followed and ideally run perpendicular to the direction of flow in the wetland. Where ruts are created these will be rehabilitated to prevent formation of preferential flow paths	
6	All alien invasive tree species will be removed from the power line servitude, with follow-up treatment/clearing to ensure clearing is successful	
7	Prior to the commencement of any excavations, the required disturbance footprint will be demarcated and all activities will be located within the demarcated area. No vegetation disturbance to take place outside the demarcated area	

8	On completion of construction at each pylon the site will be left clean and free from all debris, hydrocarbons and waste, and all excavations filled appropriately	
9	All excavations on site will be fully backfilled. Material to be replaced in excavation in correct order, i.e. material excavated from the bottom of the excavation will be placed at the bottom and topsoil must be placed on surface. No subsoil to be placed on surface	

5.2.20 Loss and Disturbance of Wetland Habitats due to Increased Sediment Transport into Wetlands

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	Institute environmental best practice guidelines as per the DWS Integrated Environmental Management Series for Construction Activities	Contractor and ESKOM
2	Dispose of all soil contaminated due to concrete mixing and use as per Eskom Environmental Management Policy and Environmental Management Programme	
3	Waste will be stored on site in clearly marked containers in a demarcated area. All waste must be disposed of offsite	

5.2.21 Loss and Disturbance of Wetland Habitats due to Stringing Transmission Cables

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	Existing access routes and disturbed areas will be utilised as far as possible to access pylon locations. Where no existing tracks are available, a single access track to each pylon location should be used	Contractor and ESKOM
2	Access tracks through wetland areas should ideally run parallel to the contour to limit the formation of preferential flow paths that could lead to erosion. Accessing pylon locations along routes perpendicular to the contour should be avoided, unless along existing tracks	
3	Surface runoff along the access routes should not lead to erosion. Where ruts have formed and remain following completion of construction activities, these will be plugged with regular shallow soil berms to prevent a preferential flow paths forming along the vehicle ruts	
4	Stringing locations should be outside delineated wetland areas if at all possible	
5	No driving through wetland/stream channels unless existing crossings are utilised	
6	No driving through saturated soils	

5.2.22 Storm water Management

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	A formal stormwater control plan for both construction and operation must be compiled prior to the onset of construction. This must be approved by the Project Engineer, ECO and any relevant authorities	Project Engineer/ Contractor/ECO
2	No stormwater must be directly discharged any wetland or associated buffers without being attenuated.	Contractor and ESKOM
3	A Storm water Management Plan must be compiled and implemented on site to ensure proper management of storm water during and after construction to ensure that pollutants and sediment are not released into any water resources	
4	Detailed plans to control and prevent erosion by water must be agreed between the Contractor and site manager, and approved by the ECO prior to the commencement of any works, including site clearance, on any portion of the site	
5	On-site storm water control systems, such as swales, berms, soil fences and attenuation ponds are to be constructed before any construction commences on the site. As construction progresses, the storm water control measures are to be monitored and adjusted to ensure complete erosion and pollution control at all times	
6	Earthworks on sites are to be kept to a minimum. Where embankments have to be formed, stabilization and erosion control measures must be implemented immediately	

7	Storm water must not be allowed to pond in close proximity to existing building foundations	
8	In the event of a failure to adequately implement the approved stormwater control plan, the Contractor must be responsible for making good all consequential environmental damage at his own cost	
9	No materials, fluids or substances are allowed to enter the stormwater system that could have a detrimental effect on the flora, fauna and aquatic life in the water courses and wetlands. Regular monitoring of the sites should be undertaken.	
10	Any site that is required to store any substances that could be regarded as hazardous in terms of water pollution must notify the Municipalities and must take measures to ensure spillages of the substance(s) can be adequately contained to prevent contamination of the water resources within the development area.	
11	No stormwater, wash water, or wastewater may be directed towards any permanent water body or wetland without the installation of a suitable filtration system to prevent pollution, including silt, from entering such water body.	
12	Construction activities should be scheduled to minimise the duration of exposure bare soils on site, especially on steep slopes.	
13	Run-off generated from cleared and disturbed areas/slopes that drains into watercourses must be controlled using erosion control and sediment trapping measures like silt fences, sandbags, earthen berms and synthetic logs, particularly where slopes are exposed. These control measures must be established at regular intervals perpendicular to the slope to break surface flow energy and reduce erosion as well as trap sediment.	

14	Sediment barriers (e.g. silt fences, sandbags,) must be established to protect water resources from erosion and sedimentation impacts from upslope. Sediment barriers should be regularly maintained and cleared so as to ensure effective drainage.	
15	The berms, sandbags and/or silt fences must be maintained and monitored for the duration of the construction phase and repaired immediately when damaged. The berms, sandbags and silt fences must only be removed once vegetation cover has successfully re-colonised the disturbed areas post-rehabilitation	
16	During construction, the Contractor must check the site for erosion damage after every rainfall event, and rehabilitate this damage immediately	

5.2.23 Rise in Ambient Noise

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	The speed limit will be 40km/h on all roads running through and accessing the study area	Contractor and Eskom
2	Equipment/ machinery to be used must comply with manufacturers specifications acceptable noise levels;	
3	Ensure high level of equipment maintenance, especially intake and exhaust mufflers	
4	Maintain a complaints and grievance register and act promptly to complaints regarding noise	
5	Construction vehicles will be restricted to travel only on designated of the proposed development	
6	Construction vehicles and activities will only operate during daytime hours	

5.2.24 Increased Traffic

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	The speed limit will be 40km/h on all roads running through and accessing the study area	Contractor and ESKOM
2	Construction vehicles will be restricted to travel only on designated roadways	
3	Appropriate road signage will be erected during the construction phase	
4	Transportation of abnormal loads as per Eskom's Traffic Management Plan	
5	Construction vehicles will only operate during daytime hours	

5.3 Operational Phase

5.3.1 Loss of Faunal Habitat

Regular clearing/mowing of vegetation along the power line route during operation will require vehicles and machinery to access the power line servitude, including access into wetland areas. This is likely to lead to disturbance of vegetation and fauna, especially if vehicles venture off defined tracks and access routes.

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	Vegetation clearing must be kept to the absolute minimum servitude required for safe operation of the power line	Contractor and ESKOM
2	Vegetation clearing must be kept to the absolute minimum servitude required for safe operation of the power line	
3	Complete removal of vegetation must be avoided	
4	No driving through wetland/stream channels unless existing crossings are utilised	
5	Install appropriate bird flappers and identified locations along the power line	
6	Periodic walk down of the power line to inspect the route for any possible avifaunal casualties	
7	When any casualties are observed, a qualified avifaunal specialist must be contacted to assist with the placement of suitable and/or additional bird flappers on the power line	
8	The speed limit will be 40km/h on all roads running through and accessing the study area, to minimise the risk of vehicle collisions with faunal species	

9	Maintenance vehicles will be restricted to travel only on designated roadways to limit the ecological footprint of the proposed development	
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5.3.2 Wetland Degradation

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	Vegetation clearing must be kept to the absolute minimum servitude required for safe operation of the power line	Contractor and Eskom
2	Vegetation clearing must be limited to removal of alien trees and mowing of grass and reeds. Complete removal of vegetation must be avoided	
3	No driving through wetland/stream channels unless existing crossings are utilised	
4	Existing access routes and disturbed areas identified during the construction phase will be utilised as far as possible to access power line route	

5.4 Decommissioning of Existing Underground Cables

5.4.1 Vehicle Movement

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	Construction traffic must be restricted to designated routes	Contractor and Eskom
2	The site will be demarcated by a green net or an alternative net to minimise visual impact	

5.4.2 Soil Erosion and Contamination

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	All earthworks must be adequately controlled and managed	Contractor and Eskom
2	Any excavations must be clearly marked and demarcated	
3	Only topsoil in the footprint should be removed and soil disturbance to areas outside the decommissioning footprint must be avoided.	
4	Bare areas must be revegetated as soon as works in that area is completed	

5.4.3 Ground and Surface Water Contamination

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	Water usage, land use, waste management, and on-site sanitation associated with the decommissioning must be designed and managed so as not to impact, insofar as possible negatively on the groundwater resources on the site	Contractor and Eskom
2	Facilities for the collection and disposal of waste on the site should occur in sealed surfaces which would ensure that there is no waste entering the soil profile or water courses	
3	The site must be managed in order to prevent the pollution of surface and groundwater, due to suspended solids, silt or chemical pollutants	
4	Promote water saving mind set with construction workers in order to ensure less water wastage	

5.4.4 Soil Erosion

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	Any evidence/signs of sheet erosion should be remediate immediately	Contractor and Eskom

5.4.5 Flora and Fauna

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	Revegetate disturbed areas. Revegetation process to include following steps: <ul style="list-style-type: none"> ○ Preparing area to be revegetated ○ Replacing of topsoil ○ Maintaining the revegetated area until the vegetation has established itself ○ Implementing a monitoring programme for at least one year after the revegetation process 	Contractor and ESKOM
2	The prevention of alien species establishment in disturbed areas to be monitored by the Contractor (form part of monitoring programme)	
3	Except to the extent necessary for the carrying out of construction activities, vegetation shall not be removed, damaged or disturbed	
4	Trapping, poisoning and/ or shooting of animals to be strictly forbidden	

5.4.6 Habitat Destruction

ITEM NUMBER	MITIGATION MEASURES	RESPONSIBILITY
1	Site clearance should only be restricted to land demarcated for the powerline	Contractor and ESKOM

6 CONCLUSION

The purpose of this report is to provide the relevant authority with sufficient information regarding the potential impacts of the development to make an informed decision. This Environmental Management Programme (EMPr) is to be applied during all phases of this development as an on-site reference document. The project will result in limited negative environmental impacts, provided this development is mitigated, as per this EMPr. The responsibility lies with the Contractor to familiarise themselves with the contents of this EMPr