

## **UMKOMAAS SUBSTATION UPGRADE**

### **ENVIRONMENTAL MANAGEMENT PROGRAMME**

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## **INTRODUCTION**

UMkomaas Substation needs to be upgraded from a 22/11 kV substation to an 88/22/11 kV substation due to an increase in NMD from Umngeni water. An Environmental Impact Assessment was not carried out for this as the project does not trigger the listed activities of the National Environmental Management Act (NEMA) regulations. All activities associated with this upgrade will take place inside the existing substation yard.

This document has been developed to provide environmental management guidelines to all personnel responsible for any aspect of the upgrading of UMkomaas substation, and attention is drawn to Section 28 of the National Environmental Management Act (Act 107 of 1998), as amended, which is the '*Duty of care and remediation of environmental damage.*'

### **1.1 Purpose of the Environmental Management Plan (EMP)**

The primary purpose of this EMP is to highlight possible environmental impacts associated with the project and also to suggest practical and appropriate mitigation measures to either avoid or to lessen the effects of the impact on the environment.

This EMP serves as the environmental specification to Eskom personnel and outside contractors with regard to addressing environmental issues identified prior to construction.

The EMP must be treated as a legal binding document and must be included in all contractual agreements of all contractors and Eskom personnel working on site. Non-compliance with the EMP constitutes a contravention against environmental legislations and Eskom policies. It is the responsibility of the Project Manager and Contractor to ensure compliance with all the environmental specifications in the document as well as the relevant legislation, throughout all the phases of this development including rehabilitation.

### **1.2 AIM of the EMP**

The aim of the EMP is to;

- Ensure that the team are familiar with the environmental impacts associated with the project prior to construction, and that the mitigations measures are communicated in time so that necessary preparations are made ahead of time;

- Ensure that the team are aware of all applicable environmental legislation and internal procedures to adhere to during construction and post construction;
- Ensure that the mitigatory measures are implemented to avoid and/or minimise the identified negative environmental impacts and to enhance the positive impact of the project on the environment;
- Ensure that a monitoring programme is in place that tracks the effectiveness of the implemented mitigatory measures
- Ensure that a list of environmental representatives involved in the project are given to the construction team;
- And ensure that an environmental incident register is implemented and maintained to address environmental impacts;

## **2. SCOPE OF WORK**

### **2.1 HV Lines**

Construct a single 88kV tee line off the existing Illovo/Nkonka 3 88kV Line to the proposed new Umkomaas 88kV S/S.

### **2.2 Primary Plant (Civil)**

- Re-establish existing terrace.
- Extend terrace.
- Establish access road.
- Establish surface drainage.
- Demolish and remove existing foundations from site.
- Establish new foundations.
- Remove and replace existing bund wall as per Standard for passive fire protection in Dx substation yards.
- Establish new bund walls for new transformer and NEC as per Standard for passive fire protection in Dx substation yards.
- Future Oil dam with associated piping (drainage).
- Remove existing mesh fence and replace with steel palisade fencing.
- Establish new kerbing.
- Stoning of the yard.
- Modifications within the building.

### **2.3 Primary Plant (Electrical)**

- Establish 1 x 132kV Line Isolator
- Establish 1 x 88/22kV Transformer bay

- Conductoring, clamping
- Earthing of all equipment
- Remove and replace existing 22kV switchgear
- Commissioning of primary and control plant equipment

### 3. LEGAL CONTEXT

The following is a list of applicable environmental legislation that the project team must ensure compliance with at all times. Adherence to the following legislation and also to all Eskom standards will ensure that there is minimal to none environmental damage during the construction phase of this project.

It is the responsibility of the Project Manager to ensure the contractor complies with all the requirements of this EMP.

Non-compliance with this EMP or any of the legislation listed below will become a legal contravention, and depending on the extent of the contravention it might lead to prosecution as non-compliance with legislation is a criminal offence.

***Table 1: applicable legislation***

NAME OF ACT	No. OF ACT	REMARKS
Atmospheric Pollution Prevention Act	45 of 1965	Control of all forms of air pollution.
Conservation of Agricultural Resources Act	43 of 1983	Soil conservation, control and prevention of veld fires, control of weeds and invader plants.
National Forest Act	84 of 1998	Control and protection of indigenous and protected vegetation
National Environmental Management Act	107 of 1998	“Duty of Care and Remediation of damage” contained in section 28 of the Act 107 of 1989.
National Environmental Management: Waste Act		Regarding the management and disposal of waste
National Environmental Management: Biodiversity Act		Alien Invasive Plant management and clearing. Interaction with animals.
Nature Conservation Ordinances: KZN	8 of 1969	Protected game and plants in KwaZulu Natal

Occupational Health and Safety Act	85 of 1993	Environmental regulations for work places
National Water Act	36 of 1998	All aspects relating to the pollution of surface and ground water, surface water and wetlands.
National Veld and Forest Fire Act	101 of 1998	Prevention of veld fires, warning systems and preparedness measures. Duties and responsibilities before and during a veldfire.

## **4. EMP OBJECTIVES AND CONTRACTOR REQUIREMENTS**

The EMP has a long-term objective to ensure that:

- Appropriate Environmental Management measures and requirements are implemented from the start of the project;
- Precautions against damage and claims arising from damage are taken timeously; and
- The completion date of the contract is not delayed due to problems with landowners arising during the course of construction.

### **4.1 Eskom and Contractor Commitment**

Eskom requires a commitment from the Eskom Project Manager and the contractor on the following issues:

- Ensure that all requirements stipulated in this EMP are implemented;
- All environmental incidents that arise during construction are reported immediately and attended to in accordance to the relevant Eskom policy or standard;
- Exercise the duty of care during the construction phase and ensure that environmental damage is minimised or avoided;
- and keep an incidence register onsite to record all environmental incidences and also the corrective method used to resolve them;
- In conjunction with the Construction Supervisor; undertake regular inspections of the Contractor's site as well as the installation works in order to check for compliance with the EMP in terms of the specifications outlined in this document.
- Report to the Quality & Environmental Officer (Nandi Mbili) any environmental problems (or complaints) which cannot first be resolved in cooperation with the Contractor(s);
- Ensure that construction staff is trained in accordance with requirements of the EMP.

## **5. Inspection and Monitoring**

A monthly site visit will be conducted by the Environmental Officer, subsequent to the site visit all issues that require immediate attention will be raised with the PM. An audit report will be drafted at the end of the project.



**Table 2: Environmental Management Plan responsibilities**

<b>Activity</b>	<b>Responsible person</b>
♦ EMP implementation	♦ Environmental Officer (EO) ♦ Contractor ♦ Project Coordinator ♦ Project Manager
♦ EMP monitoring and implementation	♦ EO ♦ Contractor ♦ Supervisor ♦ Project coordinator
♦ EMP technical input & enquiries	♦ Project engineer
♦ EMP progress	♦ ECO ♦ Project coordinator

## **6. ENVIRONMENTAL SPECIFICATIONS**

The Majority of the project will take place within the Eskom substation within land that is owned by Eskom.

Prior to construction necessary notifications must be given to the neighboring properties to notify them of the project and the disturbances to access roads that will take place as part of construction.

All agreements entered into must be in writing.

### **6.1 EDUCATION**

Staff working for the Eskom contractor and sub-contractors must undergo an induction on the contents of this document and be made aware of their responsibility towards the environmental duty of care.

### **6.2 CONSTRUCTION MATERIAL REQUIREMENTS**

#### **Water**

The substation is located within Eskom Property, as this is an upgrade of an existing Substation; there should be a reliable water supply.

Should it happen, for some unforeseen circumstances, that water is not available at the Eskom site then the contractor has to either provide water with a water tanker or arrange with the municipality. A written agreement must be solicited from the landowner concerned.

Under no circumstances will water be sourced from a natural source like a river wetland or underground without the prior solicitation of the appropriate permits from the responsible government Departments.

#### **Other materials**

All other construction materials required for this project must be sourced from an Eskom approved supplier and where applicable proof must be acquired.

### **6.3 CONSTRUCTION ACTIVITY**

The construction site must be demarcated; all construction material stockpiles must be kept within the demarcated construction area. Should it happen that an area outside of Eskom demarcation is required for storage or other construction associated activity, this must be discussed with the relevant land owner and proof must be kept in writing.

The use of ready mixed concrete is preferred, where this is not possible concrete batching must be done on top of an impermeable surface. The Contractor shall ensure that no runoff from the batching site seeps through to the surrounding environment.

All generated wastes must be collected and temporarily stored in waste receptacles within a demarcated area for waste storage. These must be emptied on a weekly basis and be dumped at an approved dumping site.

All hazardous waste must be put in appropriately label containers and disposed at a site that has been licensed to receive such waste. Under no circumstances will the mixing of general waste with hazardous waste be tolerated.

The contractor must have a spill kit available onsite at all times for control of minor spills onsite.

All areas that were disturbed during the construction must be rehabilitated to as close as possible to their original condition to the satisfaction of the land owner which shall be obtained in the form of a written clearance at the completion of rehabilitation.

#### **6.4 SANITATION**

The establishment of a campsite must be in accordance to Eskom's standards.

The contractor must ensure that adequate mobile ablutions are placed onsite, these must be serviced regularly and receipt of safe disposal must be kept as proof.

The latrines must be sited taking into account the possibility of the prevailing wind unfavourably dispersing unpleasant odours.

The digging of pit latrines is prohibited both at the construction site and at the camp site.

#### **6.5 FIRE HAZARD**

All staff to be educated in fire prevention and the contractor will be held responsible to avoid the risk of fire. No area is to be denuded of vegetation to prevent fires.

Burning of waste material such as vegetation and materials resulting from maintenance activities at the site is strictly prohibited.

No fires are to be made on private property or within the substation servitude. This includes fires for cooking, warmth or any other purpose.

If activities that can cause a fire are carried out, fire extinguishers shall be available on site and in the construction camp. Due care shall be exercised to ensure that no spreading fire risk exists and that trained staff are on hand to control any inadvertent fires.

#### **6.6 SPILLAGE OF HAZARDOUS SUBSTANCES**

No diesel or noxious chemicals, cement, etc. to be spilt or left on the ground. No concrete transport vehicles to be washed on site. Where concrete, cement, chemicals or diesel is spilt, clean-up and rehabilitation must be executed.

Cleaning up of the site will be to the satisfaction of the relevant Government Departments and Eskom.

Decisive and immediate action by the contractor that results in remediation of the spill by legal means must be taken by the contractor or his appointed agents.

Failure to act within 3 hours of the commencement of the incident will be considered to be sufficient cause for Eskom to appoint an outside specialist to complete the work for the contractors account.

## **6.7 WASTE**

### **6.7.1 General Waste**

Receptacles with suitable covers must be provided and conveniently placed. Measures must be taken to Reduce, Reuse or Recycle all waste produced, where this is not possible the waste receptacles must be removed from the site for disposal at a licensed disposal site.

No waste is to be left lying around and blown around the construction site and the camp site at any time. The Site supervisor must ensure that at the end of the day a walk around the site is done to ensure that no waste is left around onsite.

All personnel working onsite are to ensure that the site is waste is managed properly, no burning of general waste is allowed at any time onsite.

### **6.7.2 Construction waste**

All construction waste that has been generated must be stored in a demarcateduygt and labeled area;

Rubble must be stockpiled and removed from site when it is a load full, this must be done regularly.

Scrap metal must also be stored in a separate stockpile and removed from site regularly.

No waste is to be left on site whether it is biodegradable or not. Unutilised, construction materials are to be removed once construction has ended, e.g. crushed stone may not be left or randomly strewn around the site.

### **6.7.3 Hazardous waste**

Servicing of vehicles in the veld is strictly prohibited. Only emergency repairs shall be allowed in the line servitude. In the event of a breakdown in the veld, any oil spills shall be cleaned up immediately. Drip trays must be placed underneath all standing machinery and excavators.

Used oils, grease or hydraulic fluids shall be placed therein and removed on a regular basis.

All hazardous substances, as defined in SANS 10228 Annexure B2 and C, at the site shall be adequately stored and accurately identified, recorded and labelled in accordance with SANS (e.g. Polychlorinated Biphenyl's – UN 2315 – PCB/Askarel) (ESKASAAC2). This includes the relevant Hazmat signage and markings.

All hazardous waste shall be disposed of at a licensed, Class H, disposal site. This applies to the oil in pole-mounted transformers that can leak and pose an environmental risk. All water contaminated by oil spills is to be reported to the Department of Water Affairs and Forestry if applicable.

The incident shall be reported according to the Standard for Reporting, Recording, and Investigating Incidents or Accidents (SCSASAA03) within a period of 24 hours.

## **6.8 ENVIRONMENTAL INCIDENTS**

Environmental incidents such as bird kills, animals killed or oil spills during construction, etc. must be monitored and recorded on the Eskom incident form and referred for the attention of the Environmental Officer.

The contractor must keep a complaints register on site to record all complaints received and the corrective measures undertaken.

## **6.9 EROSION/DRAINAGE**

Erosion must be contained and prevented on an ongoing basis. Where erosion occurs as a result of inappropriate design e.g. inadequate runoff drainage design, canalisation or dispersion from roads or at the base of towers, the Environmental Officer must be consulted and improvements effected.

Erosion outside the servitude that was not caused by operation or maintenance activities is the responsibility of the landowner. If, however, operation and maintenance activities have caused erosion outside the servitude, it is the responsibility of Eskom to repair it and prevent further erosion damage. The contractor shall be responsible for repairing erosion caused by construction activities.

The substation must be fenced to limit access from outsiders. During the site inspection it was noted that there was quad-bike tracks inside the Substation, this could culminate to erosion especially during the rainy season.

## **6.10 CLEARING OF VEGETATION**

Vegetation around the site has already been cleared; any vegetation issues must be communicated with the Environmental officer prior to any clearing.

The topsoil which includes the grass/ground cover that will be removed during the earth moving activities must be stored in such a manner that it will be used again during the rehabilitation stage.

The top soil stockpile must be kept free of weeds and must be protected from being blown away by wind.

## **6.11 USE OF HERBICIDES**

Only Eskom approved chemicals must be used in the control of weeds and pests. The application shall be according to set specifications, the manufacturer conditions must not be deviated from.

Herbicides may only be applied by a qualified Herbicide Applicator who is in possession of a Herbicide Applicators' License. The possibility of leaching into the surrounding environment shall be properly investigated and only environmentally friendly herbicides shall be used.

Only suitably qualified, registered personnel are permitted to apply any herbicides, and then only under the conditions as set in the Eskom guidelines.

All plants outside the construction footprint of the substation and which would not interfere with the operation of the substation should be left undisturbed.

#### **6.12 COURTESY**

Environmental clauses must be included in contract documents for all contractors. All complaints must be reported, recorded and investigated.

All damage done to property must be reported to Eskom and the landowner. Repairs to the damage must be done immediately. Damaged ground surfaces, due to vehicle movement, must be repaired to the satisfaction of the landowner, written proof must be obtained.

#### **6.13 DAMAGE**

Any damage to private property shall immediately be reported to the Eskom PM and the owner. The damage shall be rectified immediately if possible and/or appropriate compensation shall be paid to the owner at the discretion of the Eskom project manager/co-coordinator in consultation with the property owner.

A record of damages and rectifying action shall be kept. The owner's satisfaction with the outcome of rectifying action shall be obtained in writing.

#### **6.14 THEFT AND POACHING**

Theft and poaching will not be tolerated. Criminal prosecution in terms of relevant legislation could result from any such action.

No hunting of animals and no digging of medicinal plants or any other plant material is allowed, the contractor must communicate this to the rest of the team.

## **6.15 DUST AND NOISE**

Dust and noise during construction must be monitored so as not to cause a nuisance to the neighbouring properties. Factors such as wind can often affect the intensity to which these impacts are experienced.

During low humidity and windy conditions the contractor must provide dust reduction measures such as use of a water tanker to water the ground.

Construction equipment must be serviced regularly to limit the noise emitted during use. Working on site must be limited within 06:00 am to 06:00 pm.

## **6.16 ACCESS**

The new access road to the substation must be constructed in such a way that promotes water runoff from the centre of the road to the stormwater catchment drains on the side to prevent forming of potholes and water damage.

During the construction of the access road traffic control measures must be utilized to ensure the safe passage of vehicles accessing the neighbouring properties.

Adequate storm water drainage must be put to control storm water away from the road, and appropriate water speed attenuation must be placed at the end of every storm water pipe or drain to prevent erosion.

It is advisable that V drains around the substation and around the access road be grassed rather than concreted; this will help with minimizing the risk of erosion around the substation.

No existing drainage lines (natural or man-made) shall be blocked during construction, should a drainage system need to be diverted this must be done in consultation and approval of the Engineer and the PM.

No soil conservation or erosion control measures shall be crossed unless agreed upon in writing by the EEO.



### **6.17 TOPSOIL**

Any topsoil removed must be stockpiled neatly and the smaller vegetation within the topsoil must not be removed but left to decompose.

All weeds that will grow on the top soil stockpile must be pulled out immediately.

### **6.18 SCARIFICATION**

When the bulldozer or other equipment completes cutting a bank any resultant scarification lines must be perpendicular to the slope and not vertical. This helps hold replaced topsoil and prevents its slip.

### **6.19 WATER QUALITY**

In accordance with the requirements of the Water Act, surface and ground water shall not be polluted or contaminated (oil, petrol, herbicides, ash, dust etc.) under any circumstances. Storm water shall be managed to ensure that it does not become polluted.

Storm water run-off must be managed effectively in areas where it may negatively impact on the structures of power lines as well as to avoid storm water damage and erosion to adjacent properties. Drainage systems also need to be kept clean from debris at all times.

Measures should be implemented to ensure that run-off water on the servitude does not run into dongas and cause an erosion hazard.

The location of the oil Dam should not be constructed in natural drainage lines.

### **6.20 FAUNA**

Protected or endangered animal species occurring on Eskom servitudes must be identified and protected from Eskom's operation and maintenance activities. No animals may be killed on private property.

## **7. SITE REHABILITATION SPECIFICATION**

Should the contractor not comply with this requirement either upon completion of the work or within 14 days of a written request from Eskom to do so, Eskom shall be entitled to

employ other persons to carry out this work. All expenses consequent thereon or incidental thereto shall be borne by the contractor and shall be recoverable from him by Eskom, or may be deducted by Eskom from any moneys due, or which may become due, to the contractor.

### **7.1 Areas to be Revegetated**

Cut and fill slopes, areas spoiled during construction, such as batching plant sites, stockpile areas, and closed or redundant sections of access road, as declared by the EEO, are to be stabilised and re-grassed by seeding or planting with strip sods.

### **7.2 Site Preparation**

- **Banks (cut or fill)**

Banks must not be steeper than 1:3 and cut back where necessary.

- **Replace Topsoil**

Excess topsoil is to be re-spread on areas to be vegetated to a maximum depth of 50mm

- **Levelling**

General levelling and straightening of spoiled areas along the road and around borrow pits is required.

- **Compacted Areas**

Areas compacted during construction, requiring rehabilitation; need to be ripped perpendicular to the slope to a depth of 150mm.

- **Fertiliser**

2:3:2 Fertiliser is to be applied @ 300kg/ha.

- **Wash-aways**

The onus rests on the rehabilitation contractor to ensure that wash-aways are prevented or damage incurred, in the event of a wash-away, repaired.

### **7.3 Grassing**

- **Date of Planting**

Planting is scheduled to commence as soon as construction is completed or at the order of the EEO.

- **Instant Lawn**

Strips of instant lawn, *Cynodon dactylon*, 100mm thick, are to be planted in rows 150mm wide and 300mm apart, in areas considered highly sensitive to erosion by the EEO, and staked where necessary.

- **Seed Mix**

Areas denuded of vegetation during construction and between sods on banks must be re-seeded with a mixture of the following (except where the landowner requests an alternate mix):

<b>Grass Species</b>	<b>Application Rate (kg/ha)</b>
<i>Eragrostis teff</i>	4
<i>Paspalum notatum</i>	2
<i>Chloris gayana</i>	10
<i>Cynodon dactylon</i>	2
<i>Eragrostis curvula</i>	10
<i>Digitaria eriantha</i>	2
<b>Total</b>	<b>30</b>

If construction transpires in winter (beginning of April to end August) the following grass seed mix is required:

<b>Grass Species</b>	<b>Application Rate (kg/ha)</b>
<i>Lolium multiflorum</i>	10
<i>Eragrostis curvula</i>	10
<i>Chloris gayana</i>	5
<i>Paspalum notatum</i>	2.5
<b>Total</b>	<b>27.5</b>

All seed supplied should be labelled in accordance with the Government Seed Act No. 20 of 1961 and the contractor should be able to produce such certification.

#### **7.4 Maintenance Period**

- **Initial Visit**

Subsequent to initial planting being complete an initial site visit ensues.

- **Monthly Inspections**

Subsequently monthly site visits for five months are undertaken to inspect maintenance and growth of vegetation and ensure erosion is prevented.

**8. EMP AMENDMENTS**

The EMP is a live document, and can be amended to suit the conditions onsite. Should there be any aspect or section of the EMP that requires amendment or revision, this must be communicated with Environmental Officer.