# INTERNAL ENVIRONMENTAL MANAGEMENT PROGRAMME

# ESSELEN SUBSTATION GROUNDWATER MONITORING STATION

***Compiled by*:**

**Bukelwa Masiza**
1 Maxwell Drive
Sunninghill
Johannesburg
2000

**Tel: (011) 516 7674/ 083 743 2786**
Email: MasizBS@eskom.co.za

# DOCUMENT CONTROL

| | NAME | SIGNATURE | DATE |
|---|---|---|---|
| **COMPILED BY:** | Bukelwa Masiza<br><br>TPD Environmental Officer |  | 28 February 2024 |
| **REVIEWED BY:** | Mpho Makhura<br><br>Senior Environmental Advisor |  | 29 February 2024 |

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# Contents

# 1. INTRODUCTION

## 1.1 EXECUTIVE SUMMARY

Esselen Transmission Substation is in Esselen Park, Tembisa; an area which is underlain by Malmani Subgroup dolomitic rocks of the Chuniespoort Group (1: 250 000 Geological Series, 2628 East Rand). A dolomitic stability investigation (DSI) was conducted by a geo-professional and the site was classified as follows:

- C3 type development in terms of SANS 1936:2012.
- IHC 3/4/6/7 with a D3 dolomite area designation.
- IHC 8 with a D4 dolomite area designation.

The DSI reported further details that the groundwater draw down has little to none impact on the dolomitic stability in the subsurface; however, a ground water monitoring station must be implemented at Esselen Substation as part of compliance to regulations and a safety measure based on the Inherent Hazard Classification (IHC) of the site.

## 1.2 SCOPE OF THIS EMPr

This Environmental Management Programme (EMPr) has been compiled to address the potential environmental impact that might occur during the rehabilitation of the sinkholes that have formed at the Esselen substation.

This document serves as the environmental specification to Eskom personnel and contractors with regards to addressing the environmental issues identified prior to and during the construction phase. It is the responsibility of the Project Manager (PM), Contractors and the Environmental Practitioner to ensure compliance with all the environmental specifications in this document as well as the relevant legislations.

This EMPr must be viewed as a contract document to which all Eskom employees and contractors involved should adhere to.

**NB: This EMPr document will only cater for the scope of work contained in it. Any activities outside the given scope of work will need to be addressed through the correct process (i.e., Method statements).**

## 1.3 ROLES AND RESPONSIBILITIES

| Function | Roles and responsibilities |
|---|---|
| **Contractor Environmental Officer (CEO)** | The CEO ensures that all Sub-contractors working under the Principal Contractor abide by the requirements of the EMPr. The Contractor is answerable to the Project Manager for all environmental issues associated with the project. Contractor performance will, amongst others, be assessed on health, safety and environmental management criteria. The primary role of the CEO is to coordinate the environmental management activities of the Contractor on site.<br>Be on site throughout the duration of the project and be dedicated to the project.<br>Ensure all the staff are aware of the environmental requirements, conditions, and constraints with respect to all of their activities on site.<br>Implementing the environmental conditions, guidelines and requirements as stipulated within the EMPr and Method Statements.<br>Attend the Environmental/ SHE Site Meeting.<br>Undertaking corrective actions where non-compliances are registered within the stipulated timeframes.<br>Report back formally on the completion of corrective actions.<br>Environmental monitoring as required by applicable legislation.<br>Assist the EEP in maintaining all the site documentation.<br>Prepare the site inspection reports and corrective action reports for submission to the EEP.<br>Compile and send the monthly monitoring report and send it to the EEP |
| **Eskom Environmental Practitioner (EEP)** | To ensure that a friendly, practical, environmental management programme (EMPr) for the construction phase of a project is compiled and approved.<br>To ensure that all conditions as stipulated in the EMPr are met; and |

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| | To conduct audit, monitor or provide assurance before, during and post construction |
| **Project Manager/Site Manager** | Represents and act on behalf of Eskom Transmission regarding the administration of contracts.<br>In consultation with the Planning Engineer, determines the scope of work.<br>To provide scheduling, aspects of co-ordination and estimating.<br>Ensure implementation of the project plan within cost, time and quality constraints.<br>Ensure that implementation of EMPr is executed as planned; and<br>Keep the asset owner informed of progress made during the life cycle of the project.<br>The Project Manager shall ensure that conditions in this EMPr are fulfilled before the contractor occupies the site. |
| **Contractor** | To provide all necessary supervision during the execution of the project.<br>To appoint a competent Environmental / Safety Health and Environment Officer.<br>To implement the projects as per the approved project plan.<br>To ensure that implementation is conducted in an environmentally acceptable manner.<br>To fulfil all obligations as per the agreed contract.<br>To inform and educate all employees about the environmental risks associated with the different activities that should be avoided during the construction process and lessen significant impacts to the environment. |

## 1.4 LEGISLATIVE CONTEXT

The following National Environmental related Acts were considered in the compilation of this EMPr.:

- National Environmental Management Act, 1998 (NEMA) (Act No 107 of 1998), and all amendments and supplementary listings and/or regulations.
- Environment Conservation Act, 1989 (ECA) (No 73 of 1989) and amendments.
- National Environmental Management: Waste Act, 2008 (NEMWA, Act 59 of 2008);
- National Environmental Management Act: Biodiversity, 2004 (NEM:BA) (Act No. 10 of 2004) and amendments.

- National Forest Act, 1998 (NFA) (No 84 of 1998);
- National Veld and Forest Fire Act, 1998 (Act No. 101 of 1998);
- Conservation of Agricultural Resources Act, 1983 (CARA) (Act No. 43 of 1983) and amendments.
- National Heritage Resources Act, 1999 (Act 25 of 1999);
- National Water Act, 1998 (Act 36 of 1998);
- The Occupational Health and Safety Act, 1993 (Act No. 85 of 1993);
- The National Fencing Act, 1963 (Act No 31 of 1963) as amended by Act 108 of 1991;
- The National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) and its Regulations.
- The National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004);
- The Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983);
- South African National Standard (SANS) 10228 – The identification and classification of dangerous goods

## 1.5 PUBLIC INVOLVEMENT

- The potential environmental impacts associated with the proposed project are required to be considered in compliance with the Environmental Impact Assessment (EIA) Regulations of 2014 published in Government Notice R982 to R985 on 4 December 2014, in terms of Chapter 5 of the National Environmental Management Act, 1998 (Act 107 of 1998) (as amended).
- The above scope of work was assessed against the Listing Notices of the EIA Regulations 2014 and the following is noted:
    - All the required refurbishment works will be done directly on the existing Esselen Substation footprint and within the existing servitudes; therefore, the project would not trigger the EIA listed activities.
    - Public involvement process as prescribed in Chapter 6 of GNR No. R982 of December 2014 (the “2014 EIA Regulations as Amended”) and are also guided by relevant principles contained in Chapter 2 of NEMA will not be required as the work does not trigger EIA activities.

# 2. DESCRIPTION OF THE PROJECT

## 2.1 SITE LOCATION

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The site is in Esselen Park, approximately 13 km north of Kempton Park and the site is adjacent R21 road. The site is accessible through Long Ave, a gravel round leading to the substation. The centre coordinates of the site are 26º 00' 17.53"S longitude and 28º 16' 06.56" E latitude. The predominant land use in the region is agricultural

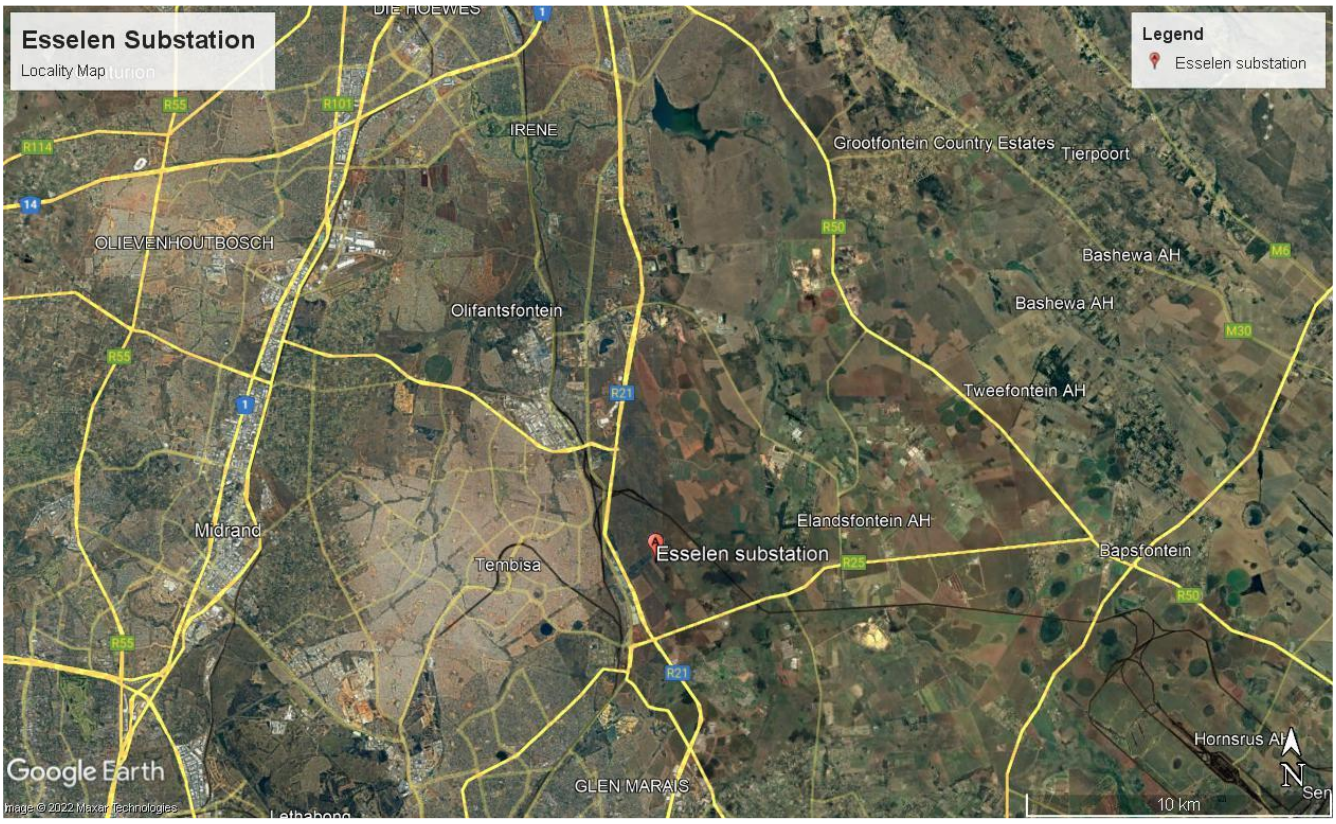


**Figure 2: Satellite imagery – Esselen Substation**

## 2.2 Regional Geology

The regional geology of the area is underlain by the Malmani Subgroup dolomitic rocks of the Chuniespoort Group (1: 250 000 Geological Series, 2628 East Rand). The Malmani Subgroup is comprised of the Oaktree Formation as the oldest formation followed by the Monte Christo, Lyttelton, Eccles and Frisco Formation in chronological order from oldest to youngest of age.

The subdivision of the Malmani Subgroup is based on the differences in chert content, stromatolite morphology, intercalated shales and erosion surfaces (Button, 1973b).

Dolomite is a Calcium/Magnesium Carbonate rock which is soluble in the presence of a weak acid water, such as rainwater. This occurs when the weak acid erodes away the calcium carbonate structure of the mineral/rock, percolating through fissures and fault zones, eventually resulting in large cavities or a collapse of the surface ground, known as a sinkhole. During this dissolution, the dolomite dissociates into low strength insoluble manganese oxides, chert an iron oxides.

 CaMg(CO3)2 + 2H2CO3 Ca(HCO3)2 + Mg(HCO)2

### 2.3 Regional Geohydrology

According to the DSI conducted the site is located within the Sterkfontein Dolomite Compartment in the A21A Groundwater Management Unit in the Crocodile West and Marico Water Management Area. The hydrogeological properties of the compartment are characterised by the karst nature of dolomite aquifers.

The DSI conducted by Thoka Geosciences at Esselen substation for the hydrogeology of the site indicates that the groundwater levels may be expected to be a maximum depth of approximately 30 m from the natural ground level. The contractor to be appointed should note that Thoka Geosciences recommends ODEX drilling systems to be implemented specifically for securing groundwater monitoring points.

## 3. SCOPE OF WORK

The contractor shall perform the following:

1. Study the existing geohydrological data presented in the DSI and supplement that information with information from local authorities and organisation’s dealing with groundwater
2. Establish site as required for purposes of installation of GWMS

3. Drill boreholes at specified positions. Ensure that the borehole is stable and provides required adequate casing for borehole stability for the purposes of monitoring groundwater.
4. Construct concrete base at the mouth of the borehole for stability in the NGL. Refer to drawing ESS22P15-SE-E94, Concrete Base Detail.
5. The GWMS should be adequately housed/covered to protect from adverse climatic conditions, i.e. rain, sun, etc.
6. Liaise with the relevant authorities regarding the undertaking of the project and ensure compliance with relevant authorities.
7. Prepare a report containing all the relevant information pertinent to the project; this should include the following but not limited to:

a. Type of groundwater monitoring system used.
b. As-built drawings presented in (dgn format).
c. Operational Manual.
d. Maintenance Manual.
e. Precautionary procedures: i.e. proactive and reactive measures based on data reading

# 4. PROJECT SPECIFIC ENVIRONMENTAL CONTROLS

This section specifies standard mitigation measures to be followed by the parties responsible for the rehabilitation of the sinkholes that have formed at the Esselen substation.

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | RESPONSIBILITY |
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| **4.1.1 Project contract and programme**<br>• The EMPr must be included as part of the tender documentation thereby making it part of the enquiry document to make the recommendations and constraints, as set out in this document, enforceable under the general conditions of contract.<br>• A copy of this EMPr must be always available at all the Substations mentioned above. The Contractor shall ensure that all the personnel on site, sub-contractors and their teams, suppliers, etc. are familiar with and understand the specifications contained in this EMPr. | Contingencies for minimising negative impacts anticipated to occur during the construction phase.<br><br>Ensure environmental awareness and formalize environmental responsibilities and implementation. | Contract records Signed declaration pro-format. | During tender stage<br><br>During construction | Eskom & Contractor |
| **4.1.2 *Method statements***<br>• All activities which require method statements may only commence once the method statements have been approved by the PM and EEP<br>• Where applicable, the contractor shall provide job-specific training/awareness on an *ad hoc* basis when workers are engaged in activities, which require method statements.<br>• It must be ensured that Eskom policies, guidelines and standards are consulted to ensure that method statements meet requirements as set out in these documents. | Contingencies for minimising negative impacts anticipated to occur during the construction phase. | Approved method statements and relevant pro forma documents<br><br>Training records | As and when required | Contractor |
| **4.1.3 Site demarcation and development**<br>• All conditions contained in this EMPr. must be adhered to and considered when site demarcation and development takes place.<br>• No activities will be allowed outside the demarcated area.<br>• . | Contingencies for minimising negative impacts anticipated to occur during the construction phase | Demarcated area | As and when required | Contractor |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | RESPONSIBILITY |
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| **4.1.4 Construction site establishment**<br>• A Method Statement shall be provided by the contractor prior to any onsite activity that includes the layout of the construction camp in the form of a plan showing the location of key infrastructure and services (where applicable), including but not limited to offices, vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous materials storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas, ablution facilities, waste and wastewater management;<br>• Location of construction camps must be carefully considered and approved by Eskom to ensure that the site does not impact on sensitive areas<br>• Sites should be located where possible on previously disturbed areas.<br>• The construction camp shall be fenced. | Ensure that environmental issues are taken into consideration in the planning and construction of site establishment | Impact to the environment during site establishment is minimised. | Before construction activities commence. | Eskom & Contractor |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | RESPONSIBILITY |
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| **4.1.5 Emergencies, non-compliance, and communication**<br>• Compile an Emergency Response Plan prior to the commencement of the proposed project.<br>• The Emergency Response Plan must deal with accidents, harsh weather conditions, disasters, wildlife interactions, potential spillages, and fires in line with relevant legislation.<br>• All staff shall be made aware of emergency procedures as part of environmental awareness training.<br>• The relevant local authority shall be made aware of a fire as soon as it starts.<br>• In the event of emergency, necessary mitigation measures to contain the spill or leak shall be implemented | Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies. | All emergency situations are managed in accordance with the emergency procedures. | As and when required | Contractor |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | RESPONSIBILITY |
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| **4.1.6 *Hazardous Chemical Substances (if Applicable)***<br>• The contractor must provide **method statements** for the "handling & storage of hazardous chemical substances", "fire", and "emergency spills procedures".<br>• The substances must be confined to specific and secured areas within the contractor's site, and in a way that does not pose a danger of pollution even during times of high rainfall. These areas must be imperviously bunded with adequate containment *(at least 1.5 times the volume of the fuel)* for potential spills or leaks<br>• Drip trays (*minimum of 10cm deep*) must be placed under all vehicles that stand for more than 24 hours. Vehicles (including plant and equipment) suspected of leaking must not be left unattended, drip trays must be utilised.<br>• The surface area of the drip trays will be dependent on the vehicle and must be large enough to catch any hydrocarbons that may leak from the vehicle/plant while stationery.<br>• All spilled hazardous substances must be contained in impermeable containers for removal to a licensed hazardous waste management facility/site, (this includes contaminated soils, and drenched spill kit material). | Prevention of pollution of the environment.<br><br>Minimise chances of transgression of the acts controlling pollution. | No pollution of the environment.<br><br>No litigation due to transgression of pollution control acts.<br><br>No complaints from Interested and Affected Parties.<br><br>Method statements | Daily | Contractor |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | RESPONSIBILITY |
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| **4.1.7 *Cement (If Applicable)*** | | | | |
| • The contractors must provide and maintain a **method statement** for "cement and concrete batching". The method statement must provide information on proposed storage, washing & disposal of cement, packaging, tools and plant storage.<br>• The mixing of concrete shall only be done at specifically selected sites on mortar boards or similar structures to contain run-off into, drainage lines, streams and natural vegetation.<br>• Concrete mixing and cement batching should take place on hard concrete surfaces.<br>• Cleaning of cement mixing and handling equipment shall be done using proper cleaning trays.<br>• All empty containers must be stored in a dedicated area and later removed from the site for appropriate disposal at a licensed commercial facility. Any spillage that may occur must be investigated and immediate remedial action shall be taken.<br>• The visible remains of concrete, either of solid, or from washings, shall be physically removed immediately or disposed of as waste to a registered landfill site.<br>• Cement batching areas must be in consultation with the PM, EO to ensure residues are contained and that the proposed location does not fall within sensitive areas such as drainage lines, storm water channels, etc. | Minimise the possibility of cement residue entering the surrounding environment.<br><br>Minimise pollution of soil, surface, and ground water resources. | No evidence of contaminated soil on the construction site.<br><br>No evidence of contaminated water resources.<br><br>Method statement. | Monitored daily | Contractor |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | RESPONSIBILITY |
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| **4.1.8 *Dangerous and toxic materials (If Applicable)*** <br><br> **Provision of storage facilities** <br>• Materials such as fuel, oil, paint, herbicide, and insecticides must be sealed and stored in bunded areas or under lock and key, as appropriate, in well-ventilated areas. <br>• Sufficient care must be taken when handling these materials to prevent pollution. <br>• In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water and Sanitation (DWS) must be informed immediately. <br>• Storage areas shall display the required safety signs depicting "no smoking", **No Naked lights"** and **"Danger"** containers shall be clearly marked to indicate contents as well as safety requirements. <br>• The contractor shall supply a method statement for the storage of hazardous materials at tender stage. <br>• Material Safety Data Sheets (MSDS) must be prepared for all hazardous substances on site and supplied by the supplier where relevant. MSDS's must be updated as required. <br>• Where Polycarbonate Biphenyls (PCB) is required to be used it is imperative that Eskom policy document is consulted. | Prevention of pollution of soil, surface, and ground water resources in the immediate and surrounding environments. <br><br> Minimise chances of transgression of the acts controlling pollution. | No visible signs of pollution. <br><br> No litigation due to transgression of pollution control acts. | Monitor daily | Contractor |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | RESPONSIBILITY |
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| **4.1.9 *Fuel storage and oils (If applicable)*** <br>• The contractors must provide and maintain a **method statement** for "fuel tanks and refuelling procedures" <br>• Fuel storage tanks on the site shall be on an impervious surface that is bunded and able to contain at least **110%** of the volume of the tanks. <br>• The filler tap must be inside the bunded area where possible and the bund wall must not have a tap or valve. <br>• A Flammable Liquid License must be obtained for diesel volumes greater than 200 litres. <br>• An authorisation is required for volumes greater than 80 cubic metres combined that are stored on site. <br>• Fuel storage should be covered during the rainy season. | Prevention of pollution of soil, surface and ground water resources in the immediate and surrounding environments. <br><br>Minimise chances of transgression of the acts controlling pollution. | No visible signs of pollution. <br><br>No litigation due to transgression of pollution control acts. <br><br>Method statement. | Once off, as when required | Contractor |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | RESPONSIBILITY |
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| **4.1.10 Use of dangerous and toxic materials (If Applicable)**<br>• The contractor shall keep the necessary materials and equipment on site to deal with spills/ fire of the materials present.<br>• The contractor shall set up a procedure for dealing with spills / fire, which will include notifying the SEA and PM and the relevant authorities prior to commencing with construction.<br>• These procedures must be developed with consultation and approval by the appointed SEA or PM as applicable.<br>• A record must be kept of all spills and the corrective action taken. | Prevention of pollution of soil, surface, and ground water resources in the immediate and surrounding environments.<br><br>Minimise chances of transgression of the acts controlling pollution. | No pollution of the environment.<br><br>No litigation due to transgression of pollution control acts. | As when required | Contractor |
| **4.1.11 *Eating areas***<br>• The Contractor shall, in conjunction with the environmental / SHE Officer or PM designate restricted eating areas for eating during normal working hours.<br>• Adequate closed refuse bins must be provided and cleaned on a daily basis.<br>• Litter (*even if originating outside the camp*) and concrete bags etc. must be picked up daily and put into suitably closed bins. | Control potential influx of vermin and flies.<br><br>Neat workplace and hygienic environment. | No visual sign of vermin and flies.<br><br>No complaints from I & AP's. | Monitor daily | Contractor |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | RESPONSIBILITY |
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| **4.1.12 Waste Management**<br>• All measures regarding waste management shall be undertaken using an integrated waste management approach.<br>• Sufficient, covered waste collection bins (scavenger and weatherproof) shall be provided.<br>• A suitably positioned and clearly demarcated waste collection site shall be identified and provided.<br>• The waste collection site shall be maintained in a clean and orderly fashion.<br>• Waste shall be segregated into separate bins and clearly marked for each waste type.<br>• Staff shall be trained in waste segregation.<br>• Recycling of waste types shall be maximised.<br>• Bins shall be emptied regularly.<br>• General waste shall be disposed of at recognised and registered waste disposal sites/ recycling company.<br>• Hazardous waste shall be disposed of at a registered waste disposal site.<br>• Certificates of disposal for general, hazardous and recycled waste shall be maintained.<br>• Under no circumstances shall any waste be disposed of, burned or buried on site. | To avoid, manage and mitigate potential impacts to the environment caused by the incorrect storage, handling and disposal of general and hazardous solid waste. | Solid waste management is undertaken in accordance with relevant national and provincial legislation and local by-laws. | As and when required | Contractor |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | RESPONSIBILITY |
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| **4.1.13 *Sanitation*** | | | | |
| • Mobile chemical toilets shall be installed onsite if no other ablution facilities are available.<br>• The use of ablution facilities and or mobile toilets shall be always used and no indiscriminate use of the veld for the purposes of ablutions shall be permitted under any circumstances.<br>• Ablution facilities shall be located within 100metres of any workplace and shall be numerous enough to accommodate the workforce (minimum requirement of 1:15 workers on site)<br>Where mobile chemical toilets are required, the following shall be ensured:<br>• Toilets are located no closer than 100 m to any watercourse or water body.<br>• Toilets are secured to the ground to prevent them from toppling due to wind or any other cause.<br>• No spillage occurs when the toilets are cleaned or emptied, and the contents are managed in accordance with the EMPr.<br>• Toilets have an external closing mechanism and are closed and secured from the outside when not in use to prevent toilet paper from being blown out.<br>• Toilets are emptied before long weekends and workers holidays and shall be locked after working hours.<br>• Toilets are serviced regularly, and the SHE / Environment Officer must inspect toilets to ensure compliance to health standards.<br>• A copy of the waste disposal certificates shall be maintained. | An abundant supply of suitably located clean and well-maintained toilet facilities are available to all staff to minimise the risk of disease and impact to the environment. | No pollution or disease arises on-site because of sanitation facilities or lack thereof. | Daily | Contractor |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | RESPONSIBILITY |
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| **4.1.14 *Water Management*** | | | | |
| • Appropriate pollution control facilities necessary to prevent discharge of water containing polluting matter or visible suspended materials into watercourses or water bodies shall be designed and implemented.<br>• Runoff from the cement/ concrete batching areas shall be strictly controlled, and contaminated water shall be collected, stored and either treated or disposed of off-site, at a location approved by the Project Manager.<br>• All spillage of oil onto concrete surfaces shall be controlled using an approved absorbent material and the used absorbent material disposed of at an appropriate waste disposal facility.<br>• Water that has been contaminated with suspended solids, such as soils and silt, may be released into watercourses or water bodies only once all suspended solids have been removed from the water by settling out these solids in settlement ponds. | To avoid, manage and mitigate potential impacts to the environment caused by wastewater discharge during construction. | Wastewater management is undertaken in accordance with relevant national and provincial legislation and local by-laws. | Daily | Contractor |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | RESPONSIBILITY |
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| **4.1.15 *Dismantling of old equipment (If Applicable)***<br>• All old equipment removed during the project must be stored in such a way as to prevent pollution of the environment.<br>• Oil containing equipment must be stored to prevent leaking or be stored on drip trays.<br>• All scrap steel must be stacked neatly, and any disused and broken insulators must be stored in containers.<br>• Once material has been scrapped and the contract has been placed for removal, the disposal Contractor must ensure that any equipment containing pollution causing substances is dismantled and transported in such a way as to prevent spillage and pollution of the environment.<br>• The Contractor must also be equipped to contain and clean up any pollution causing spills.<br>• Disposal of unusable material must be at a registered waste disposal site and a certificate of disposal must be obtained and copied to the developer. | Impact to the environment to be minimised during the dismantling, storage and disposal of old equipment commissioning. | All scrap material to be disposed of accordingly. | When dismantling takes place | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | RESPONSIBILITY |
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| **4.1.16 Fauna Management (If Applicable)**<br>• Both sites are surrounded by the cattle farmers.<br>• Environmental induction training must include safety with wild and livestock animals into the talk to all workers on site.<br>• Focus on animals such as snakes and other reptiles that often generate fear by telling the labour force how to move safely away and to whom they report the sighting of such animals.<br>• The labour force should also be informed where snakes most often hide so that they can be vigilant when lifting stones etc.<br>• Employees must be trained on how to deal with fauna species as intentional killing will not be tolerated. | Minimise disturbance to animals.<br><br>Minimise interruption of breeding patterns of birds.<br><br>Minimise destruction of habitat. | No complaints from Nature Conservation.<br><br>No litigation concerning applicable animal protection acts.<br><br>No measurable or visible signs of habitat destruction | Monitor daily | Contractor |
| **4.1.17 Fire Management**<br>• Designate smoking areas where the fire hazard could be regarded as insignificant.<br>• Educate workers on the dangers of open and/or unattended fires.<br>• No open fires shall be allowed on site under any circumstances.<br>• Firefighting equipment shall be available on all vehicles located on site.<br>• Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site. | To minimise the risk of fire during construction. | Fire prevention measures are carried out in accordance with the National Veld and Forest Fire Act, 101 of 1998. | As and when required | Contractor |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | RESPONSIBILITY |
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| **4.1.18 Access roads**<br>• Existing roads and services must be utilised as far as possible.<br>• No unauthorised access is permitted.<br>• Any damage or degradation will be investigated, and fines issued, the affected areas must be immediately rehabilitated.<br>• No driving off from the marked roads is permitted and designated parking areas must be identified and demarcated with applicable signage.<br>• Any damages on access road shall be rehabilitated before the contractor leave the site. | Minimise loss of topsoil and enhancement of erosion.<br><br>Minimise fauna and flora displacement by destruction of natural habitats. | No erosion on access roads after completion of construction.<br><br>No loss of topsoil due to runoff water on access roads. | As required | Contractor |
| **4.1.19 No-go / sensitive areas (if applicable)**<br>• All construction activities must remain within the boundaries of the development area, as demarcated at the start of construction.<br>• The construction footprint must be kept to a minimum by constructing boundaries and demarcated around areas not to be disturbed thus reducing the infringement of the development on natural habitat.<br>• No-go areas must be demarcated with fencing/warning tape and signs before any construction activities commence.<br>• Vehicles are only to access the site via the **existing** access road.<br>• No one is allowed to go beyond the demarcated areas. | Minimise the potential for the spread of the construction footprint<br><br>Reduce loss of fauna and flora habitat<br><br>Minimise the potential for loss of protected and or endangered fauna and flora species | No sign of movement through “no go” areas.<br><br>Containment of footprint | Monitor daily | |

| MITIGATION MEASURE | MANAGEMENT OBJECTIVES | MEASURABLE TARGETS | FREQUENCY OF ACTION | RESPONSIBILITY |
|---|---|---|---|---|
| **4.1.20 Installation of equipment**<br>• Management of dust shall be conducted in accordance with Dust management section<br>• Management of equipment used for installation shall be conducted in accordance Workshop equipment maintenance and storage section.<br>• Management hazardous substances and any associated spills shall be conducted in accordance with Hazardous substances section.<br>• Residual solid waste shall be recycled or disposed of in accordance with Solid Waste Management method statement | Impact to the environment to be minimised during the installation of equipment. | Impact to the environment is minimised through adherence to EMPr requirements. | Daily | |
| **4.1.21 Rehabilitation**<br>• All areas disturbed by construction activities shall be subject to landscaping and rehabilitation.<br>• Rehabilitation at substation sites shall be undertaken in accordance with civil designs. | Areas disturbed during construction are returned to a state that approximates the state, which they were before disruption. | Landscaping and rehabilitation are undertaken in accordance with the approved rehabilitation plan/specification. | At the end of the project | Contractor |

# 5. CONCLUSION

This Environmental Management Programme report should be used as an on-site reference document during all phases of this project, and auditing should take place to determine compliance with this EMPr. Parties responsible for transgression of this EMPr should be held responsible for any rehabilitation that may need to be undertaken. Parties responsible for environmental degradation through irresponsible behaviour / negligence should receive penalties as stipulated in TPD Environmental Requirements for Contractors and/or Suppliers (TPDMAN-ST-37).

Process facilitated the identification of relevant and practical mitigation measures, which may be used by the construction team and Eskom to draw up and respond to tender documentation. It is thus a key to this process that this document is included during tendering to allow all potential bidders for this work to seriously consider and cost for such mitigation. This will ensure that the document receives the necessary buy in that it requires from the outset of the project. In order to have records of environmental incidences and the handling thereof, it is suggested that incidence logs be filled in by the CEO. The project manager needs to be informed of such incidences and further actions need to be taken, should the need arise.