ESKOM HENDRINA – PRAIRIE – MARATHON SUBSTATIONS AT PRAIRIE AND MARATHON

ENVIRONMENTAL MANAGEMENT PLAN

NOVEMBER 2007

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SEF Ref: 501096
DEAT Ref: 12/12/20/959

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1 BACKGROUND

Strategic Environmental Focus (Pty) Ltd, as independent environmental consultants and environmental assessment practitioners, has been appointed by Eskom Transmission to compile and submit an Environmental Management Plan (EMP) to the decision making authority; Department of Environmental Affairs and Tourism (DEAT); for the construction of the following:

- A 400 kV Transmission Line of approximately 85 km between Hendrina and Prairie substations;
- A 400 kV Transmission Line of approximately 100 km between Prairie and Marathon substations;
- Two new 400 kV substations, one each near the existing Prairie and Marathon substations; and
- Associated works to integrate the stations into the transmission grid.

The Transmission Lines and their associated substations are located in the Mpumalanga Province. The substation at Hendrina is located near the Arnot Power Station. The substation at Prairie is located at the Assmang Plant adjacent to Machadodorp. The Marathon substation is located near Nelspruit.

A new servitude of 55 m wide will have to be created to cater for the Transmission Lines. However, this report deals with the application for the construction of the two substations at Prairie and Marathon only. In this respect, it is important to note that two related EIA applications have been submitted: one for the substations (the subject of this EIA report) and another for the Transmission Lines (the subject of another EIA report). The public participation processes for these applications is being conducted as a single process, but the reporting is separated.

The underlying philosophy of this document aims to advocate a comprehensive and sustainable urban environment satisfying the needs of economic growth.

1.1 ENVIRONMENTAL ASPECTS ADDRESSED

The purpose of this EMP is to formulate mitigation measures that should be made binding to all contractors during construction of the Capacitor bank, as well as measures that should be implemented during the operational phase. The point of departure for this EMP is to take a pro-active route by addressing potential problems before they occur. This should limit corrective measures needed during the construction and operational phases of the development. Additional mitigation will be included throughout the project's various phases as necessary.

This EMP addresses the following three phases of the development:

1.1.1 The Pre-Construction Planning Phase

Due to the conceptual nature of the development at this time, additional planning will still be undertaken. This is an ideal opportunity to incorporate pro-active environmental

management measures with the goal of attaining acceptable impacts the development will have on the receiving environment.

Pro-active environmental measures minimize the chance of impacts taking place. There is still the chance of accidental impacts taking place; however, through the incorporation of contingency plans (e.g. this EMP) during the planning phase, the necessary corrective action can be taken to further limit potential impacts.

1.1.2 The Construction Phase

The bulk of the impacts during this phase will have immediate effect (e.g. noise, dust and possible surface water pollution). If the site is monitored on a continual basis during the construction phase, it is possible to identify these impacts as they occur. These impacts will then be mitigated through the contingency plans identified in the planning phase, together with a commitment to sound environmental management from the developer.

A method statement template is attached. This is to be competed for all areas that require method statements in terms of the EMP.

1.1.3 The Operational Phase

By taking pro-active measures during the planning and construction phases, potential environmental impacts emanating during the operational phase will be minimised. This, in turn, will minimise the risk and reduce the monitoring effort, but it does not make monitoring obsolete. Monitoring of certain sensitive issues such as water quality and the general state of the water resources will still be required.

1.2 ACTIVITY AND LOCAL CONTEXT

The proposed Prairie B and Marathon B substations will be within a 400 m x 400 m fence boundary. The 400 kV busbar system (including all associated infrastructure) will fit within this space. The existing substations are located as follows:

- Prairie Substation is located on Portion 4 of the Farm Schoongezicht 364 JT, approximately 5 km south of Machadodorp (next to the Assmang plant); and
- Marathon Substation is located on the Remainder of Portion 3 of the Farm Marathon 275 JT.

2 ENVIRONMENTAL MANAGEMENT PLAN

The following tables form the core of this EMP for the pre-construction, construction and operational phases of this development. This table should be used as a checklist on site during each phase of the development. It should be noted however that Eskom generic guidelines and procedures must be followed and adhered to for all activities that take place for all phases of the capacitor bank (it is the responsibility of the contractor to ensure that the latest version is sought prior to the commencement of any activity on site). These include but are not limited to:

TPL 41-142 Safety earthing of capacitor banks
TPL 41-435 Transmission environmental policy
TGL 42-336 Fire protection association guideline
TGL 41-337 Erosion guideline
TRMPVACV2 Access to farms
EPL 32-94 Eskom SHE policy
ESKASAAC2 Management of Polychlorinated Biphenyls

2.1 ROLE PLAYERS AND RESPONSIBILITY MATRIX

In order for the EMP to be successfully implemented, all the role players involved in the project need to co-operate. For this to happen, role players must have a clear understanding of their roles and responsibilities in the project, must be professional, form respectful and transparent relationships, and maintain open lines of communication. The EMP therefore clearly defines possible role players to be involved and indicates their role in the implementation of the EMP.

Typically, these role players or the project team may include the Authorities (A), Other Authority (OA), Developer/Proponent (D), Consulting Engineers (CE), Resident Engineer (RE), Environmental Officers (EO), Environmental Site Officer (ESO), Environmental Control Officer (ECO), Project Manager (PM), Contractors (C), Environmental Assessment Practitioner (EAP). Further; landowners, interested and affected parties and the relevant environmental and project specialists are also important role players.

Table 1 gives an indication of the functions and responsibilities of the project team.

Table 1: **Project team responsibilities matrix**

KEY	FUNCTION	RESPONSIBILITY
D	**Developer**	Proponent ultimately accountable for ensuring compliance to the EMP and conditions contained in the Environmental Authorisation (EA). The ECO must be contracted by the developer (full time or part time depending on the size of the project) as an independent appointment to objectively monitor implementation of relevant environmental legislation, conditions of Environmental Authorisations (EA's), and the EMP for the project. The developer is further responsible for providing and giving mandate to enable the ECO to perform responsibilities. The developer must ensure that the ECO is integrated as part of the project team.
CE	**Consulting Engineer**	Contracted by the developer to design and specify the project engineering aspects. Generally the engineer runs the works contract. The CE may also fulfil the role of Project Manager on the proponent's behalf (See PM).
PM	**Project Manger**	The Project manager has over-all responsibility for managing the project, contractors, and consultants and for ensuring that the environmental management requirements are met the CE may also act as the PM. All decisions regarding environmental procedures must be approved by the PM. The PM has the authority to stop any construction activity in contravention of the EMP in accordance with an agreed warning procedure.
RE	**Resident Engineer**	The consulting engineer's representative on site. Has the power/mandate to issue site instructions and in some instances, variation orders to the contractor, following request by the EO or ECO. The RE Oversees site works, liaison with Contractor and ECO.
EO/ EM	**Environmental Officer /Environmental manager**	Appointed by the Consulting Engineers as their environmental representative on site. The EO is not independent but must rather act on behalf of the consulting engineers with the mandate to enforce compliance under the project contract, which must include the EMP. The EO has the directive to issue non-conformance and hazard certificates. Further, in terms of accepted industry practice the EO could issue the equivalent of a "cease works" instruction only in exceptional circumstances where serious environmental harm has been or is about to be caused i.e. in cases of extreme urgency and then only when the RE is absent. The EO must form part of the project team and be involved in all aspects of project planning that can influence environmental conditions on the site. On certain types of projects, such as linear developments (fences, pipelines, etc), the EO must also be the liaison between the contractor and landowners. The EO must attend relevant project meetings, conduct daily inspections to monitor compliance with the EMP, and be responsible for providing reports and feedback on potential environmental problems associated with the development to the project team and ECO. The EO shall convey the contents of this EMP to the Contractor site team and discuss the contents in detail with the Contractor as well as undertake to conduct an induction and an environmental awareness training session prior to site handover to all contractors and their workforce. The EO must be suitably experienced with the relevant qualifications and preferably competent in construction related methods and practices.

KEY	FUNCTION	RESPONSIBILITY
ECO	**Environmental Control Officer**	An independent appointment to objectively monitor implementation of relevant environmental legislation, conditions of Environmental Authorisations (EA's), and the EMP for the project. The ECO must be on site prior to any site establishment and must endeavour to form an integral part of the project team. The ECO must be proactive and have access to specialist expertise as and when required, these include botanist's ecologists etc. Further the ECO must also have access to expertise such as game capture, snake catching, etc. The ECO must conduct audits on compliance to relevant environmental legislation, conditions of EA, and the EMP for the project. The size and sensitivity of the development, based on the EIA, will determine the frequency at which the ECO will be required to conduct audits. (A minimum of a monthly site inspection must be undertaken). The ECO shall be the liaison between the relevant authorities and the project team. The ECO must communicate and inform the developer and consulting engineers of any changes to environmental conditions as required by relevant authoritative bodies. The ECO must ensure that the registration and updating of all relevant EMP documentation is carried out. The ECO must be suitably experienced with the relevant environmental management qualifications and preferably competent in construction related methods and practices. The ECO must handle information received from whistle blowers as confidential and must address and report these incidences to the relevant Authority as soon as possible. On small projects, where no EO is appointed, the ECO shall convey the contents of this EMP to the Contractor site team and discuss the contents in detail with the Contractor as well as undertake to conduct an induction and an environmental awareness training session prior to site handover to all contractors and their workforce.
C	**Contractor**	The principle contractor, hereafter known as the 'Contractor', is responsible for implementation and compliance with the requirements of the EMP and conditions of the EA's, contract and relevant environmental legislation. The Contractor must ensure that all sub-contractors have a copy of and are fully aware of the content and requirements of this EMP. The contractor will be required, where specified to provide Method Statements setting out in detail how the management actions contained in the EMP will be implemented.
ESO	**Environmental Site Officer**	The ESO is employed by the Contractor as his/her environmental representative to monitor, review and verify compliance with the EMP by the contractor. This is not an independent appointment; rather the ESO must be a respected member of the contractor's management team. Dependent on the size of the development the ESO must be on site one week prior to the commencement of constriction. The ESO must ensure that he/she is involved at **all phases** of the constriction (from site clearance to rehabilitation).
A	**Lead Authority**	The authorities are the relevant environmental department that has issued the Environmental Authorisation. The authorities are responsible for ensuring that the monitoring of the EMP and other authorisation documentation is carried out, this will be achieved by reviewing audit reports submitted by the ECO and conducting regular site visits.
OA	**Other Authority**	Other authorities are those that may be involved in the approval process of an EMP. Their involvement may include reviewing EMP's to ensure the accuracy of the information relevant to their specific mandate. Other authorities may be involved in the development, review or implementation of an EMP. For example if a specific development requires a water use licence for the relevant national authority then that authority should review and comment on the content of the particular section pertaining to that mandate.

KEY	FUNCTION	RESPONSIBILITY
EAP	**Environmental Assessment Practitioner**	The definition of an environmental assessment practitioner in section 1 of NEMA is "the individual responsible for the planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management plans or any other appropriate environmental instruments introduced through regulations".

2.2 CONTRACTOR ENVIRONMENTAL METHOD STATEMENTS

Method Statements are written submissions to the Engineer by the Contractor, in collaboration with his/her ESO, in response to a request by the EO and or Engineer. The Method Statements set out the plant, materials, labour and method that the contractor proposes using to carry out an activity, identified by the EO and/or Engineer. The Method Statements contain the appropriate detail such that the EO and Engineer are able to assess whether the Contractor's proposal is in accordance with the requirements of the EMP. The contractor must sign each Method Statement along with the EO and Engineer to formalise the approved Method Statement.

All Method Statements including those which may be required as *ad hoc* or emergency construction method statements must be submitted to the Engineer for approval prior to the commencement of the activity.

Any changes to the method of works must be reflected by amendments to the original approved Method Statement. Any changes in this regard must be approved by the EO and Engineer on the understanding that such changes are environmentally acceptable and in line with the requirements of this EMP.

The *pro forma* Method Statements attached must be used and method statements for the following activities must be submitted to the EO, ECO and Engineer for approval before construction commences.

- Solid waste management
- Crew camps and construction lay down areas
- Workshop and maintenance/cleaning of plant
- Cement and concrete batching
- Dust control
- Hydrocarbon and emergency spills procedures
- Diesel tanks and refuelling procedures
- Sourcing, excavating, transporting and dumping of fill and spoil material
- Topsoil management
- Fire
- Rehabilitation of crew camp and other disturbed areas

2.2.1 Site Documentation

The following is list of documentation that must be held on site and must be made available to the ECO and/or DEAT on request.

- Access negotiations and physical access plan
- Site daily diary /instruction book/ Incident reports
- Records of all remediation / rehabilitation activities
- Copies of EO reports (management and monitoring)
- Environmental Management Plan (EMP)
- Complaints register
- Method statements

2.2.2 *Pro Forma* Documentation

2.1.1.1 Prior to the commencement of construction activities

The following attached *pro forma* documentation is to be filled out and is binding to the EMP and project contract and includes, but is not limited to the following:

- Declaration of understanding by the Proponent
- Declaration of understanding by the Engineer
- Declaration of understanding by the Contractor
- Method statements
- ECO / Engineer approval for method statements

2.1.1.2 During construction activities

The following attached pro forma documentation is to be filled out and maintained. These are binding to the EMP and project contract. They include, but are not limited to, the following:

- Amended Method Statements
- ECO / Engineer approval for amended method statements
- Environmental incidents
- Records of all remediation / rehabilitation activities

2.2.3 National and Provincial Acts and Guidelines

The common list of legislative references contained herein is by no means exhaustive but is applicable to the general principles of this document, these include:

Animals Protection Act No. 71 of 1962
Provides for the protection of animals

Atmospheric Pollution Prevention Act No. 45 of 1965
Control of noxious and offensive gases, smoke, dust and vehicular emissions
DEAT: Regional Air Pollution Control Office

Conservation of Agricultural Resources Act No. 43 of 1983
Control of the utilisation and protection of wetlands, soil conservation, control and prevention of veldt fires, control of weeds and invader plants
Department of Agriculture

Environment Conservation Act No. 73 of 1989

National Environmental Management Act No. 107 of 1998
Control/prevention of pollution; combating of noise; activities which may have a detrimental effect on the environment, preparation and contents of environmental impact reports
Department of Environmental Affairs and Tourism, Department of Water Affairs and Forestry, Directorate: Environmental Management of the Provincial Department of Environmental and Cultural Affairs and Sport, Local Authorities

Fencing Act No. 31 of 1963
Clearing of bushes for border fencing, Access to property for fencing
Department of Agriculture

Forest Act No. 122 of 1984

Hazardous Substances Act No. 15 of 1973
Provides for the control of substances, which may cause injury or ill health to, or the death of human beings
National Department of Health. Local Authorities may be authorized

Health Act No. 63 of 1977
Control of solid, liquid and gaseous wastes that may pose a health hazard
Department of Health and Local Authorities

Minerals and Petroleum Resources Development Act No. 28 of 2002

National Act on Forests Act No. 84 of 1998
Control over encroaching, protection of trees on private land, prevention and extinction of fire hazards
Department of Water Affairs and Forestry

National Building Regulations and Standards Act 103 of 1977 (SABS 0400)

National Heritage Resources Act No. 25 of 1999

National Road Traffic Act No. 93 of 1996
Provides for road traffic matters which apply uniformly throughout South Africa
Department of Transport.

National Veldt and Forest Fires Act No.101 of 1998
Fire Protection Associations. Building of fire breaks.
Department of Water Affairs and Forestry

National Water Act No. 36 of 1998

Water Services Act No. 108 of 1997
Diversion or impoundment of rivers. Conservation and use of water. Treatment and disposal of waste, wastewater and effluent. Pollution and pollution emergencies. Water Users & Associations. Dam safety. Registration of boreholes
Department of Water Affairs and Forestry

Nature Conservation Ordinance No. 74 of 1979
Private Nature Reserves, Conservancies, Certificate of adequate enclosure, translocation and re-establishment of animals. Craft on inland waters. Certification of hunting regulations and protection of flora & fauna

Occupational Health and Safety Act No. 85 of 1993
Controls the exposure of employees and the public to dangerous and toxic substances or activities
Department of Labour

Road Transportation Act No. 74 of 1977
Department of Transport

World Heritage Resource Act No 49 of 1999
Conservation of national heritage and archaeological material
South African Heritage Resources Agency.
National Council for Heritage

Table 2: Pre-Construction

Phase of development	**PRE-CONSTRUCTION (PLANNING)**
Impact / issue	**GENERAL**

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Project contract and programme The EMP 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. A copy of this EMP must be available on site. The Contractor shall ensure that all the personnel on site, sub-contractors and their team, suppliers, etc. are familiar with and understand the specifications contained in the EMP.	• Contingencies for minimising negative impacts anticipated to occur during the construction phase • Ensure environmental awareness and formalise environmental responsibilities and implementation	• Contract records • Signed declaration pro forma's	Project team	-
Appointments and duties of project team The contact details for the ECO, RE, EO, Contractor and ESO shall be completed on the attched proforma and a copy kept on site (As applicable). Before construction activities commence, role players must have a clear indication as to their role in the implimentation of this EMP as indicated in 2.1 Table 1. Subcontractor(s) contracts with the principle contractor must contain a clause to the effect that the disposal of all construction-generated refuse / waste to an officially approved dumping site is the responsibility of the subcontractor in question and that the subcontractors are bound to the management activities stipulated in this EMP.	• Contingencies for minimising negative impacts anticipated to occur during the construction phase	• Contract records • Signed declaration pro forma's	Project team	As and when required

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Method statements All activities which require method statements may only commence once the method statements have been approved by the engineer and/or ECO. Where applicable, the contractor shall provide job-specific training on an *ad hoc* basis when workers are engaged in activities, which require method statements. 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 • Training records	Contractor, Engineer	As and when required
Site demarcation and development The site must be completely and clearly demarcated and fenced before the contractors set up their crew camps or begin construction. All 'general' and 'specific' conditions contained in the RoD must be adhered to and considered when site demarcation and development takes place. No activities will be allowed outside the demarcated area.	• Contingencies for minimising negative impacts anticipated to occur during the construction phase	• Demarcated area's • Filled in section of this document	Engineer, contractor	As and when required
Emergencies, non-compliance and communication The contractor must provide method statements on the protocols to be followed, and contingencies to be put in place for the following potential incidents before construction may begin: Contamination of natural water resources from spills; contamination of soils from spills; and fire. The contractor must ensure that all the contact details and telephone numbers of health personnel, fire fighters and decision making authorities are noticeable on site in case of an emergency.	• Contingencies for minimising negative impacts anticipated to occur during the construction phase	• Method statements	Contractor, Engineer	As and when required

Table 3: Construction Phase

Phase of development	**CONSTRUCTION**
Impact / issue	**Materials**

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Handling				
Oil and chemicals The contractor must provide method statements for the "handling & storage of oils and chemicals", "fire", and "emergency spills procedures". These 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 Drip trays (minimum of 10cm deep) must be placed under all vehicles that stand for more than 24 hours. Vehicles suspected of leaking must not be left unattended, drip trays must be utilised. 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 while standing. All spilled hazardous substances must be contained in impermeable containers for removal to a licensed hazardous waste site, (this includes contaminated soils, and drenched spill kit material).	• Prevention of pollution of the environment • Minimise chances of transgression of the acts controlling pollution	• No pollution of the environment • No litigation due to transgression of pollution control acts • No complaints from I & AP's • Method statements	Contractor	Daily

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Stockpiles All stockpiled material must be easily accessible without any environmental damage. All temporarily stockpiled material must be stockpiled in such a way that the spread of materials are minimised. The stockpiles may only be placed within the demarcated areas the location of which must be approved by the RE, EO or ECO (As applicable). The contractor must avoid vegetated areas that will not be cleared. No plant, workforce or any construction related activities may be allowed onto the topsoil stockpiles. Stock piles must not be higher than 2m to avoid compaction thereby maintaining the soil integrity and chemical composition.	• Minimise scaring of the soil surface and land features • Minimise disturbance and loss of soil • Minimise construction footprint • Minimise sedimentation of nearby drainage lines • Maintain the integrity of topsoil's for landscaping and rehabilitation • Containment of invasive plant growth • Minimise contamination of storm water run-off	• No visible erosion scars once construction is completed • The footprint has not exceeded the agreed site in terms of EA etc. • Minimal invasive weed growth • No signs of sedimentation and erosion	Contractor	Daily
Cement 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. 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. Cleaning of cement mixing and handling equipment shall be done using proper cleaning trays. 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.	• Minimise the possibility of cement residue entering into the surrounding environment • Minimise pollution of soil, surface and ground water resources	• No evidence of contaminated soil on the construction site • No evidence of contaminated water resources • Method statement	Contractor	Monitored daily

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
The visible remains of concrete, either solid, or from washings, shall be physically removed immediately and disposed of as waste to a registered landfill site. Cement batching areas must be located in consultation with the RE to ensure residues are contained and that the proposed location does not fall within sensitive areas such as drainage lines, storm water channels, etc.				
DANGEROUS AND TOXIC MATERIALS **Provision of storage facilities** Materials such as fuel, oil, paint, herbicide and insecticides must be sealed and stored in bermed areas or under lock and key, as appropriate, in well-ventilated areas. Sufficient care must be taken when handling these materials to prevent pollution. Training on the handling of dangerous and toxic materials must be conducted for all staff prior to the commencement of construction. In the case of pollution of any surface or groundwater, the Regional Representative of the **Department of Water Affairs and Forestry** (DWAF) must be informed immediately. 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. The contractor shall supply a **method statement** for the storage of hazardous materials at tender stage. 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. Where Polycarbonate Biphenyls (PCB) is required to be used it is imperative that Eskom policy document *ESKASAAC2* is consulted.	Prevention of pollution of soil, surface and ground water resources in the immediate and surrounding environments Minimise chances of transgression of the acts controlling pollution	No visible signs of pollution No litigation due to transgression of pollution control acts	Contractor	Monitor daily

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Fuel storage and oils The contractors must provide and maintain a method statement for "fuel tanks and refuelling procedures". 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. The filler tap must be inside the bunded area where possible and the bund wall must not have a tap or valve. A Flammable Liquid License must be obtained for diesel volumes greater than 200 litres. Environmental Authorisation is required for volumes greater than 30 000 litres 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 • Minimise chances of transgression of the acts controlling pollution	• No visible signs of pollution • No litigation due to transgression of pollution control acts • Method statement	Contractor	Once off, as required
Use of dangerous and toxic materials *Eskom Ref: ESKASAAC2* The contractor shall keep the necessary materials and equipment on site to deal with spills/ fire of the materials present should they occur. The contractor shall set up a procedure for dealing with spills / fire, which will include notifying the ECO and or RE and the relevant authorities prior to commencing with construction. These procedures must be developed with consultation and approval by the appointed EO, ECO or RE as applicable. 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 • Minimise chances of transgression of the acts controlling pollution	• No pollution of the environment • No litigation due to transgression of pollution control acts	Contractor	As required

Phase of development	**CONSTRUCTION**
Impact / issue	**PLANT**

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Eating areas The Contractor shall, in conjunction with the EO, ECO or RE designate restricted eating areas for eating during normal working hours. Adequate closed refuse bins must be provided and cleaned on a daily basis. No fires are to be lit outside of a facility designed to contain fires. The adequacy and positioning of these structures must be determined in consultation with the EO, ECO or EO. The feeding, or leaving of food, for stray or other animals in the area is strictly prohibited. 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 • Neat work place and hygienic environment	• No visual sign of vermin and flies • No complaints from I & AP's	Contractor, EO	monitor daily

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Toilets and ablution facilities The contractor will be responsible for providing all sanitary arrangements for his and the sub-contractors team. A minimum of one chemical toilet shall be provided per 15 persons. Sanitary arrangements shall be to the satisfaction of the ECO, EO or RE and the local authority. Toilets shall be of the chemical type. The contractor shall keep the toilets in a clean, neat and hygienic condition. The contractor shall supply toilet paper at all toilets at all times. Toilet paper dispensers shall be provided in all toilets. Toilets provided by the contractor must be easily accessible and a maximum of 50m from the works area to ensure they are utilised. All toilets will be located within the contractor's camp. Should toilets be needed elsewhere, their location must first be approved by the RE, EO or ECO (As applicable). The contractor (who must use reputable toilet-servicing company) shall be responsible for the cleaning, maintenance and servicing of the toilets. The contractor (using reputable toilet-servicing company) shall ensure that all toilets are cleaned and emptied before the builders' or other public holidays. Placements of toilets should avoid the possibility of the area surrounding the toilets becoming flooded. The toilet facilities provided must be used at all times The ablution facility must not be reflective to pose a visual impact.	• Ensure proper sanitation is achieved which will encourage the workforce to utilise toilets provided and not the surrounding habitat • Minimise potential of diseases on site • Minimise potential to pollute soils, water resources and natural habitats	• Workforce use toilets provided • No complaints received from I & AP's as well as members of the workforce • No visible or measurable signs pollution of the environment (soils, ground and surface water)	Contractor, RE or EO	As and when required

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Waste management The contractors must provide and maintain a method statement for "solid waste management". The method statement must provide information on proposed licensed facility to be utilised and details of proposed record keeping for auditing purposes. Waste shall be separated into recyclable and non-recyclable waste, and shall be separated as follows: · Hazardous waste: including (but not limited to) old oil, paint, etc, · General waste: including (but not limited to) construction rubble, Reusable construction material. · Recyclable waste shall preferably be deposited in separate bins. The contractor is advised that "Collect-a-Can" collect tins, including paint tins, chemical tins, etc. and "Consol" collect glass for recycling. Any illegal dumping of waste will not be tolerated, this action will result in a fine and if required further legal action will be taken. This aspect will be closely monitored and reported on; proof of legal dumping must be able to be produced on request. Bins must be clearly marked for ease of management. Sufficient closed containers must be strategically located around the construction site to handle the amount of litter, wastes, rubbish, debris and builders wastes generated on the site. Subcontractor(s) must contain a clause to the effect that the disposal of all construction-generated refuse / waste to an officially approved dumping site is the responsibility of the subcontractor in question and that the subcontractors are bound to the management activities stipulated in this EMP. Proof of this undertaking must be issued to the ECO. All solid and chemical wastes that are generated must be removed and disposed of at a licensed waste disposal site. The contractor is to provide proof of such to the EO and ECO. Chemical containers and packaging brought onto the site must be removed for disposal at a suitable site.	• Sustainable management of waste by recycling • To keep the site neat and tidy • Minimise litigation and complaints by I&AP's • Reduce visual impact • Control potential influx of vermin and flies thereby minimising the potential of diseases on site and the surrounding environment • Minimise potential to pollute soils and natural habitats	• Disposal of rubble and refuse in an appropriate manner with no rubble and refuse lying on site • Site is neat and tidy • No complaints from surrounding residents and businesses • Sufficient containers available on site • No visible or measurable signs of pollution of the environment (soils, ground and surface water) • A skip, with a cover, must be used to contain refuse from campsite bins, rubble and other construction material • Method statement	Contractor, EO	Daily

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Dust The contractor must provide and maintain a method statement for "dust control". The method statement must provide information on the proposed source of water to be utilised and the details of the licenses acquired for such usage. **Potable water can not be used as a means of dust suppression**, alternative measures must be sourced. The use of 'grey' water must be investigated as an alternative. The contractor will be responsible to source this water and obtain the required approvals to utilise this water for the purpose of dust suppression. Dust production must be controlled by regular watering of roads and works area, should the need arise. (**NB:** Concrete dust is toxic and damages soil properties. Therefore watering to prevent dust spread must not be done where concrete dust has fallen or it will infiltrate into the soil. Concrete bags must not be allowed to blow around the site and spread cement dust). In addition to the standard dust suppression measures and where these measures are not sufficient, main access roads and the site must be surfaced with a temporary surface such as gravel to assist with dust suppression. At the end of construction, the site must be fully rehabilitated by removing the temporary surface, ripping the area to loosen the soil and the area must be re-vegetated with locally indigenous vegetation only, according to the landscape development plan for the project. All vehicles transporting material that can be blown off (e.g. soil, rubble etc.) must be covered with a tarpaulin, and speed limits of 20 km/h must be adhered to. Excessive dust conditions shall be reported to the ECO. Regular monitoring of dust fallout must be carried out and the records kept on site. Baseline dust measures must be sampled and approved by the RE and ECO prior to the commencement of construction activities. All forms of dust pollution must be managed in terms of the Atmospheric Pollution Prevention Act, 1965 (**Act No.** 45 of 1965)	• Reduce dust • Reduce visual impact • Minimise loss of valuable soil material	• No visible signs of dust • No complaints from interested and Affected parties • No incidences reported to ECO • No visible evidence of dust contamination on the surrounding environment • Method statement • Baseline targets not exceeded during regular monitoring of dust counts	RE, Contractor, EO	Monitored daily

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Workshop equipment, maintenance and storage Leaking equipment shall be repaired immediately or be removed from site to facilitate repair. All potentially hazardous and non-degradable waste shall be collected and removed to a registered waste site. Cleaning and remediation must be done with products that are in line with best environmental practice e.g. Sunsorb *A method statement is required from the Contractor, tendering for the project to show procedures for dealing with possible emergencies that can occur, such as fire and accidental leaks and spillage.* The Contractor shall be in possession of an emergency spill kit that must be complete and available at all times on site. The Contractor must ensure that senior and the other relevant members of the workforce are trained in dealing with spills by using emergency spill kits. The following shall apply: All contaminated soil / yard stone shall be removed and disposed of as hazardous waste at a registered facility or placed in containers to be taken to one central point where bio-remediation can be done. (Bio-remediation should only be an option if an Environmental Authorisation has been issued) A specialist Contractor shall be used for the bio-remediation of contaminated soil where the required remediation material and expertise is not available on site. All spills of hazardous substances must be reported to the ESO, EO, RE or ECO. The contractor must comply with the regulations of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).	• Prevent pollution of the environment • Minimise chance of transgression of the acts controlling pollution • Disposal of hazardous substances in an appropriate manner	• No pollution of the environment • No litigation due to transgression of pollution control acts • Method statement	RE, Contractor, EO	Monitor daily

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Noise Prior to the commencement of any construction activities, a baseline ambient noise survey must be carried out. Equivalent continuous rating levels must be recorded for day-time (06:00 to 22:00) and night-time (22:00 to 06:00). These records must be kept on site. In terms of noise impact for various increases over the ambient, the National Noise Regulations define an increase of 7dB as "disturbing". Noise levels during construction must therefore be kept within 7dB of the baseline data. Regular monitoring of noise levels must conducted during construction and the records kept on site. All construction vehicles must be in a good working order to reduce possible noise pollution. Work hours during the construction phase shall be strictly enforced unless permission is given. Permission shall not be granted without consultation with the local residents and businesses by the EO. Noise reduction is essential and Contractors shall endeavour to limit unnecessary noise, especially loud talking, shouting or whistling, radios, sirens or hooters, motor revving, etc. The use of silent compressors is a specific requirement. Noisy activities shall take place only during working hours. The EO must inform surrounding landowners in writing 24 hours prior to any planned activities that will be unusually noisy or any other activities that could reasonably have an impact on the adjacent sites. These activities could include, but are not limited to, blasting, piling, use of pneumatic jack-hammers and compressors.	• Maintain noise levels below "disturbing" as defined in the National Noise Regulations • Minimise the nuisance factor of the development	• No complaints from surrounding landowners or I&APs	Contractor, EO	As and when required

Phase of development	**CONSTRUCTION**
Impact / issue	**CONSTRUCTION**

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Crew camps The contractors must provide and maintain a method statement for "Crew camps and construction laydown areas". Accommodation for members of the workforce will not be permitted on site unless authorisation has been given in terms of the Environmental Authorisation issued for the site. Dedicated wash areas must be situated away from watercourses and drainage lines. The contractor's camp shall be monitored for dust fallout and dust suppression applied as required. This may include the laying of gravel, the use of grey water can be considered as an option if the required permits have been acquired. The contractor's camp, offices and storage facilities shall be located within the site boundaries. No person shall be allowed to stay on neighbouring sites, unless it is cleared with the owner. In such an event all requirements contained herein for the contractor's camps will apply. The contractor shall provide labourers to clean up the contractor's camp and construction site on a daily basis. These areas shall then be inspected by the contractor or his/her ESO to ensure compliance with this requirement. The contractor shall be responsible for cleaning the contractor's camp and construction site of all structures, equipment, residual litter and building materials at the end of the construction period. The crew camp building materials must not be reflective to pose visual impacts.	• Minimise water pollution • Minimise dust fallout • Minimise unwarranted environmental damage outside the footprint • Maintain a clean and healthy working environment • Minimise impact to surrounding environment • Minimise visual impacts	• No signs of water or soil pollution • No complaints from surrounding landowners or I&APs • No visible signs of litter • Method statements	Contractor, EO, ESO	Monitor daily

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Fires *Eskom ref: TRMSCAAC1 Rev 3 section 4.1.2* The contractors must provide and maintain a method statement for "fires", clearly indicating where and for what fires will be utilised plus details on the fuel to be utilised Absolutely no burning of waste is permitted. Fires will only be allowed in **facilities especially constructed for this purpose** within fenced Contractor's camps. Wood, charcoal or anthracite are the only fuels permitted to be used for fires. The contractor must provide sufficient wood (fuel) for this purpose. Fires within the designated areas must be small in scale so as to prevent excessive smoke being released into the air. Heavy smoke may not be released into the air. No wood is to be collected, chopped or felled for fires from private or public property as well as from no-go or sensitive areas within the site and any surrounding natural vegetation. The contractor should ensure that fire-fighting equipment is available on site. A designated smoking area must be demarcated, away from hazardous substance storage areas.	• Minimise risk of veld fires • Minimise destruction of natural fauna and flora • Maintain safety on site • Compensate for the outbreak of fires originating from the site where work is undertaken	• No veldt fires started by the contractor' s workforce • No claims from landowners for damages due to veld fires • Method statement	Contractor, EO, ESO	Monitor daily
Erosion and sedimentation All slopes that are disturbed during construction shall immediately be stabilised to prevent erosion. Where re-vegetation of slopes is undertaken, this shall be done in accordance with the landscape architect (or appointed landscaper). To reduce the loss of material by erosion, the contractor shall ensure that disturbance on site is kept to a minimum. The contractor shall be responsible for rehabilitating all eroded areas in such a way that the erosion potential is minimised after construction has been completed. All disturbed areas will require rehabilitation must be mulched to encourage vegetation re-growth. Mulch used must be free from alien seed.	• Minimise erosion damage • Minimise impeding the natural flow of water • Minimise scarring of the soil surface and land features • Minimise disturbance and loss of topsoil • Re-growth of disturbed areas.	• No erosion scars • No loss of topsoil • No interference with the natural flow of water • No visible erosion scars once construction is completed • The footprint has not exceeded the agreed boundaries	Contractor, EO, ESO	As and when required

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
These areas must be cordoned off so that vehicles or construction personnel cannot gain access to these areas.		• All damaged areas successfully rehabilitated		
Fauna <u>All activities on site must comply with:</u> The regulations of the Animal Protection Act, 1962 (Act No. 71 of 1962); and Marine Living Resources Act, 1998 (Act No. 18 of 1998). All construction workers must be informed that the intentional killing of any animal is not permitted as faunal species are a benefit to society. Poaching is illegal and it must be a condition of employment that any employee caught poaching will be dismissed. Employees must be trained on how to deal with fauna species as intentional killing will not be tolerated. In the case of a problem animal e.g. a large snake a specialist must be called in to safely relocate the animal if the EO or ECO is not able to. Environmental induction training must include safety with wild animals into the talk to all workers on site. 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 to report the sighting. The labourforce should also be informed where snakes most often hide so that they can be vigilant when lifting stones etc	• Minimise disturbance to animals • Minimise interruption of breeding patterns of birds • Minimise destruction of habitat	• No complaints from Nature Conservation • No litigation concerning applicable animal protection acts • No measurable or visible signs of habitat destruction	RE, Contractor, EO, ESO	Monitor daily

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Flora Any corridors to surrounding natural areas must be maintained and protected; these must be demarcated as no-go areas. Locally indigenous plants must be used in the landscaping of the site. Plants that are proclaimed as problem plants or noxious weeds must be excluded from the landscaping plan and these must be removed immediately, should they occur on site. These plants, as well as any other problem plants within a specific region as stipulated by a qualified and experienced botanist, must be included in an alien management programme for the site. Eradication must occur every 6 months. A search and rescue operation must take place at the discretion of the ECO prior to site clearance activities. A nursery must be established should the need arise. The contractor must rehabilitate the construction camp and any other disturbed areas once construction activities have terminated. Compacted areas will be ripped and mulched in order to ensure recovery of the natural vegetation cover. A method statement must be provided and maintained by the contractor. Once construction is complete, rehabilitation of un-built areas must be undertaken in order to restore the aesthetic & ecological value of the area. It is recommended that a qualified landscape architect, qualified botanist and the ECO be consulted with regard to the most appropriate rehabilitation vegetation and structures. Active re-vegetation must take place with locally indigenous vegetation under the supervision of the ECO. No open fires shall be allowed on site under any circumstances, fires will only be permitted in adequate facility within the crew camp.	• Minimal disturbance to vegetation where such vegetation does not interfere with construction in terms of approvals from the relevant authority • Prevent litigation concerning removal of vegetation • Encourage natural habitat fauna • Minimise scarring of the soil surface and land features • Minimise disturbance and loss of topsoil • Minimise risk of veldt fires • Minimise risk of fauna and flora destruction	• No litigation due to removal of vegetation without necessary permission • No exotic plants used for landscaping • No visible erosion scars once construction is completed • The footprint has not exceeded the agreed boundaries • All damaged areas successfully rehabilitated • No veldt fires started by contractors work force • No claims from landowners for damages due to veldt fires • Method statement	Contractor, EO, ESO, Landscape Architect	As and when required

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Heritage In terms of the National Heritage Act, 1999 (Act No. 25 of 1999), construction personnel must be alert and must inform the local Council should they come across any findings of heritage resources within 24 hours if the area has been removed. Should any archaeological artefacts be exposed during construction activities, work on the area where the artefacts were found shall cease immediately and the South African Heritage Resources Agency shall be notified within 24 hours. Under no circumstances shall archaeological artefacts be removed, destroyed or interfered. Any archaeological sites exposed during demolition or construction activities must not be disturbed prior to authorisation by the South African Heritage Resources Agency on the appropriate provincial heritage resource agency.	• Limit the destruction of the country's heritage resources • The preservation and appropriate management of new archaeological finds should these be discovered during construction.	• No destruction of or damage to known archaeological sites	Contractor, EO, RE, ESO	Monitor Daily
No-go / sensitive areas *Eskom Ref: TRMSCAAC1 Rev 3 regarding "no entry"* All construction activities must remain within the boundaries of the development area, as demarcated at the start of construction. The construction footprint must be kept to a minimum by constructing boundaries and demarcated around areas not to be distributed thus reducing the infringement of the development on natural habitat. No-go areas must be demarcated with fencing/warning tape and signs before any construction activities commence. Vehicles are only to access the site via the approved access road. No vehicular movement is permitted outside of the substation designated area.	• Minimise the potential for the spread of the of the construction footprint • Reduce loss of fauna and flora habitat • Minimise the potential for loss of protected and or endangered fauna and flora species	• No sign of movement through "no go" areas. • Containment of footprint	RE, Contractor, ESO, EO	Monitor daily

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Access route/haul roads *Eskom Ref: TRMSCAAC1 Rev 3 regarding "no entry" and sections 4.4 and 4.6 regarding new access roads ad diversion berms.* Planning of any new access routes must be done in conjunction between the contractor,Eskom and the land owner. Existing roads and services must be utilised as far as possible. No unauthorised access is permitted. Any damage or degradation will be investigated and fines issued, the affected areas must be immediately rehabilitated. No driving off from the marked roads is permitted and designated parking areas must be identified and demarcated with applicable signage. Any work or access near or in a permanent drainage system may have implications in terms of the National Water Act, 1998 (Act No. 36 of 1998), and therefore may well require application for a water use licence.	• Minimise loss of topsoil and enhancement of erosion • Minimise fauna and flora displacement by destruction of natural habitats	• No erosion on access roads after completion of construction • No loss of topsoil due to runoff water on access roads	Contractor, RE or EO	As required, monitor daily

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Crime, safety and security *(Eskom ref: TPL 41-142 safety earthing of capacitor banks)* Construction procedures must make provision for earthing requirements No site staff, other than security personnel and skeleton staff shall be housed on site unless otherwise stipulated in the Environmental authorisation. Security personnel and skeleton staff shall be supplied with adequate protective clothing, ablution facilities, water and refuse collection facilities, facilities for cooking and heating so that open fires are not necessary. A boundary fence will serve to prevent access to the site, for public safety and security reasons. The access to the site must be controlled so as to restrict unauthorised personnel from entering the site. The workers on site must retain some means of identification. The ESO and the contractor are responsible for ensuring that only authorised personnel are on site at all times. The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and the National Building Regulations. *(Eskom ref: TSP 41-691, page 2 of 77 and EPL 32-94).* The contractor shall ensure that all emergency procedures are in place prior to commencing work. Emergency procedures shall include (but not be limited to) fire, spills, contamination of the ground, accidents to employees, use of hazardous substances and materials, etc. The contractor shall ensure that lists of all emergency telephone numbers / contact persons are kept up to date and that all numbers and names are posted at relevant locations throughout the construction site. The nearest emergency service provider must be identified during all phases of the project as well as its capacity and the magnitude of accidents it will be able to handle. The contact details of this emergency centre, as well as the police and ambulance services must be available at prominent locations around the construction site and the construction crew camps.	• Reduce the risk of potential incidences • Minimise the potential impact on the environment	• No incidences reported	RE, Contractor, ESO, EO	Monitor daily

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Geotechnical All trenches and excavation works must be properly backfilled and compacted according to specifications given in sub-clause 5.2.4. Of SABS 1200DA. In terms of the geotechnical investigation that was undertaken it is required that a competent concrete design and well controlled construction take place due to the soils being classified as mildly aggressive towards concrete with leaching being the dominant mode of attack.	• Minimise potential structural faults • Minimise trench collapse	• No visible signs of backfill deterioration or trench collapse	Geotechnical Engineer, Structural Engineer, Geologist, RE, Contractor	As and when required

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Hydrology The RE or the ECO must assess whether regular water sampling of surface and /or ground water resources within the immediate and/or surrounding environment are necessary. Should this be the case, baseline data from sampling should be obtained relevant to the activity and sensitivity of the area. Regular sampling must be carried out to determine deviations from the baseline data. Increased run-off during construction must be managed using berms and other suitable structures as required to ensure flow velocities are reduced. Storm water, wherever possible, should be allowed to soak into the land in the area on which the water fell. In the event of pollution caused as a result of construction activities, the contractor, according to section 20 of the National Water Act, 1998 (Act No. 36 of 1998) shall be responsible for all costs incurred by organisations called to assist in pollution control and/or to clean up polluted areas. Approval must be obtained from DWAF for any activities that require authorisation in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998). A relevant specialist must be consulted prior to the demarcation of drainage lines and wetlands. No vehicular access is allowed in permanently wet areas. No equipment shall be used which may cause irreparable damage to wet areas. The contractor shall use alterative methods of construction in such areas. "**NO ENTRY**" signs must be strategically placed along rivers, streams and other natural or man-made drainage lines which are in close proximity to access routes.	• Minimise pollution of soil, surface and ground water resources in the immediate and surrounding environments • Minimise impeding the natural flow of water • Minimise the impact on natural water flow dynamics • Minimise scarring of the soil surface and land features • Minimise damage to river and stream embankments	• No visible signs of pollution • No signs of siltation of water courses • No visible erosion scaring once construction is completed • Minimum loss of topsoil • No access roads through river and stream banks • No visible erosion scars on embankments once construction is completed • No erosion or siltation downstream • No deviation from baseline data during regular sampling	RE, Contractor, EO	As and when required, monitor daily

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Soil The contractor must provide and maintain a method statement for "management of topsoil". Topsoil must be stripped from all areas that are to be utilized during the construction period and where permanent structures and access is required. These areas will include comprising the permanent works, stockpiles, access roads, construction camps and laydown areas. Topsoil shall be stripped after search and rescue (Fauna and Flora) has been conducted and clearing of woody vegetation and before excavation or construction commences. Topsoil must be deemed to be the top layer of soil containing organic material, nutrients and plant grass seed. For this reason it is an extremely valuable resource for the rehabilitation and vegetation of disturbed areas. Ripping shall be done to a depth of 250 mm in two directions at right angles. Topsoil shall be placed in the same soil zone from which it had been stripped. At the beginning of the construction phase, topsoil removed for vegetation clearance must be stripped to a minimum depth of 150 mm and stockpiled on the demarcated topsoil stockpile areas. All topsoil must be removed and stockpiled on the site. However, the use of topsoil for rehabilitation contaminated by the seed of alien vegetation (e.g. blackjacks, etc.) must not be permitted unless a programme to germinate the seed and eradicate the seedlings is drawn up and approved, or some other mitigatory feature is found. This must be approved by the ECO. Single handling is recommended. Stock piles must not be higher than 2m to avoid compaction. Dust suppression is necessary for stockpiles older than a month – with either water or a biodegradable chemical binding agent. Backfill will require contouring to ensure that it blends in with the surrounding environment. Remediated slopes should be graded to preferably 1:2 Slopes can then be capped with topsoil. This requires a minimum layer of 100 mm in most areas.	• Minimise scaring of the soil surface and land features • Minimise disturbance and loss of soil • Minimise construction footprint • Minimise sedimentation of nearby drainage lines • Maintain the integrity of topsoil's for future landscaping and rehabilitation • Containment of invasive plant growth	• No visible erosion scars once construction is completed • The footprint has not exceeded the agreed site in terms of EA etc. • Minimal invasive weed growth • No signs of sedimentation and erosion • Disturbed surfaces to be rehabilitated must be ripped and the area must be backfilled with excavated material from the site. • Method statement	Contractor	Daily

Table 4: Operational Phase

Phase of development	**OPERATIONAL**
Impact / issue	**General**

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Storm water Management Storm water, wherever possible, must be allowed to soak into the land in the area on which the water has been discharged. The storm water system, especially the discharge points, must be inspected and damaged areas must be repaired if required. Where vegetation has been utilised as part of the storm water management system, it is important to ensure that the vegetation is maintained and does not die, as this is essential for effective infiltration. For all maintenance undertaken reference must be made to recommendations in the engineer's reports and or the approved storm water management plan. All maintenance activities must be monitored to ensure that no environmental damage occurs. All damage must be mitigated immediately.	• Minimise pollution of soil, surface and ground water resources • Minimise the potential loss of topsoil • Minimise the potential of flooding of the development, or its neighbouring properties	• No evidence of pollution at the discharge points • No evidence of silt build-up at the discharge points • No complaints from I & AP's	Management body, maintenance crew: '*to be announced'*	As and when required Monitor seasonally

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
ATMOSPHERIC POLLUTION **Air pollution** All forms of dust/air pollution must be managed in terms of the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965), this includes the control of noxious and offensive gases, smoke, dust and vehicular emissions Under no circumstances may heavy smoke be released into the air. **Light pollution** Night time light sources must be directed away from, conservation areas, naturally vegetated areas, as this may be the cause of ecological disturbance. **Noise pollution** Noise levels shall be kept within acceptable limits, these are determined in terms of the relevant local by laws.	Reduce visual impact Minimise chances of transgression of the acts controlling pollution	No complaints from surrounding residents and businesses	Management body: '*to be announced*'	Monitor daily

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Safety and Security Boundary wall if present must be regularly inspected and maintained to prevent any damage. All fencing on site must be managed in terms of the **Fence Act No. 31 of 1963** All maintenance and repair work must be done in accordance with **National Building Regulations and Standards Act 103 of 1977** Maintenance work must not be the cause of environmental damage. Any environmental damage caused must be investigated and mitigated immediately. Where Electric fences are installed, these must be monitored to ensure that animals have not been trapped. If animal fatalities have occurred these must be investigated and the services of a qualified specialist (bird, reptile…) must be employed to implement the correct management action to prevent further fatalities. An emergency plan (including fire management) must be developed and implemented; the relevant authority must approve this plan. Ensure that all fire extinguishers are replaced on or before their expiry dates. Ensure that pump devices are in good working order.	• Reduce the risk of potential incidences • Minimise litigation and complaints by I&AP's	• No complaints from surrounding residents and businesses	*Contractor*	As and when required
Traffic management Access to and from the capacitor banks will take place strictly along the service road.	• Maintainance of Access road	No complaints from surrounding residents and businesses	*Land Owner*	Monitored continually
Landscape maintenance All alien invasive plant species must be removed for disposal at a registered organic waste transfer facility.	Reduce visual impact	EMP pro forma documentation	*Land owner*Management body: '*to be announced*'	Monitor seasonally

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
Infrastructure maintenance *Eskom ref: TSP 41-691; TPL 41-142* The Capacitor must be maintained in accordance with engineer's specifications.	• Reduce visual impact • Minimise pollution of soil, surface and ground water resources	• No complaints from surrounding residents and businesses • No pollution of the environment	*Management body*	As and when required Monitor as part of a monthly maintenance inspection/schedule
Upgrades and renovations Were civil's contractor	• Contingencies for minimising ne	• EMP pro forma documentation	*Management body*	As and when required

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
s g or a w t or i ks v ar e e re i q m ui p re a d c wi t th s in th a e n d t e i v c el i o p p a m t e e nt d fo r t u o p gr o a c di c n u g r a n d d u re r n i o n				

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
vation activities, the planning and construction EMPhere in must be im g construction activities				

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION
pl e m e nt e d.				

3 CONCLUSION

Provided that mitigation measures are implemented as per this EMP, the project will result in limited negative environmental impacts. The impacts anticipated from the construction of the proposed project are considered as acceptable. The development is in line with the exceptional service to the development of South Africa and its peoples.

Furthermore, this EMP should be seen as a dynamic management tool, which should be reviewed, updated and modified as the project progresses and additional impacts are identified. The environmental incident log sheet (Table 5) is designed to assist with the site inspections, which will take place continuously during the construction and operational phase.

4 RECOMMENDATIONS

This Environmental Management Plan (EMP) should be used as an on-site reference document during all phases of this development, and monthly auditing should take place in order to determine compliance with this EMP. Parties responsible for transgression of this EMP shall be held responsible for any rehabilitation that may need to be undertaken. Parties responsible for environmental degradation through irresponsible behaviour or negligence should receive penalties.

Table 5: Environmental Incident Log

DATE	ENVIRONMENTAL CONDITION	COMMENTS (Include any possible explanations for current condition and possible responsible parties. Include photographs, records etc. if available)	CORRECTION ACTION TAKEN	SIGNATURE

DATE	ENVIRONMENTAL CONDITION	COMMENTS (Include any possible explanations for current condition and possible responsible parties. Include photographs, records etc. if available)	CORRECTION ACTION TAKEN	SIGNATURE

Table 6: Complaints Record Sheet

COMPLAINT'S RECORD SHEET **File Ref:**

DATE: …

…

…

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…

Page …. of ….

COMPLAINT RAISED BY:

CAPACITY OF COMPLAINT

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:

COMPLAINT RECORDED BY:
COMPLAINT:
PROPOSED REMEDIAL ACTION:

ECO:

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_____ Date:

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ANNEXURE 1

METHOD STATEMENT

CONTRACT:…….
DATE:…….

WHAT WORK IS TO BE UNDERTAKEN (give a brief description of the works):

WHERE ARE THE WORKS TO BE UNDERTAKEN (where possible, provide an annotated plan and a full description of the extent of the works):

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:…….. **End Date:**…….

HOW ARE THE WORKS TO BE UNDERTAKEN (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

DECLARATIONS for Method Statement [ ]

1) ENGINEER
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____

_____

(Signed) (Print name)

Dated:._____

2) CONTRACTOR
I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____

_____

(Signed) (Print name)

Dated: _____

ANNEXURE 2

DECLARATION OF UNDERSTANDING BY THE DEVELOPER

I, _____

Representing _____

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

Contract _____

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

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2: _____

ANNEXURE 2

DECLARATION OF UNDERSTANDING BY THE ENGINEER

I, _____

Representing _____

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

Contract _____

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

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2: _____

ANNEXURE 3

DECLARATION OF UNDERSTANDING BY THE CONTRACTOR

I, _____

Representing _____

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

Contract _____

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

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2:

Annexure 4

Eskom Policies and Guidelines

TPL 41-142 Safety earthing of capacitor banks

TPL 41-435 Transmission environmental policy

TGL 42-336 Fire protection association guideline

TGL 41-336 Erosion guideline

TRMPVACV2 Access to farms

EPL 32-94 Eskom SHE policy

ESKASAAC2 Management of Polychlorinated Biphenyls