



AMENDED

ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

for the

**PROPOSED CONSTRUCTION OF 132KV DIPOMPONG AND TSWAING SUBSTATIONS
AND THEIR ASSOCIATED POWER LINES**

DEA Reference Number: DEA REF NO: 14/12/16/3/3/1/1038

NEAS Reference Number: DEA/EIA/00014744/2013

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1. INTRODUCTION AND BACKGROUND

Eskom Holdings SOC Limited, Distribution Division is proposing to construct the 132kV Dipompong and Tswaing Substations and three associated overhead Power Lines in Winterveldt area near Soshanguve. The proposed substations proposed and powerline routes and are situated across the City of Tshwane in Gauteng Province and Madibeng Local Municipality in North West Province. The project aims to strengthen the network supplying Winterveldt, improve the reliability of the network and create capacity for new and existing customers in the region which is located Winterveldt area.

In terms of the NEMA EIA Regulations, 2010: GN544 promulgated under Chapter 5 of the National Environmental Management Act (Act 107 of 1998) ("NEMA"), and published in Government Gazette 33306 on 18 June 2010; a Basic Assessment Report (BAR) is required for this project. Therefore, in order to be able to construct the proposed 132kV overhead power line and Blue Hills substation, an application for environmental authorisation must again be obtained.

Eskom Holdings SOC Ltd has appointed Envirolution Consulting as independent environmental consultants, to undertake the BAR process. The main objective of the BAR is to identify and assess potential environmental impacts associated with the proposed project, and to compile appropriate mitigation measures. An application was submitted to DEA and acknowledgement of receipt was received on 15 March 2013. The following reference numbers were allocated:

- DEA Reference Number: 14/12/16/3/3/1/860
- NEAS Reference Number: DEA/EIA/00014744/2013

After submission of the Draft Basic Assessment Report, DEA allocated the project a new reference number:

- DEA Reference : 14/12/16/3/3/1/1038

It is understood that any development can pose various risks to the environment as well as the residents or businesses in the surrounding area. These possible risks should be taken into account during the planning phase of the development. An Environmental Management Programme (EMPr) is required for the proposed project as per the National Environmental Management Act (Act No. 107 of 1998) (NEMA) EIA Regulations, 2010. The implementation of this EMPr, through the appointed contractor, remains the responsibility of the applicant, Eskom.

The purpose of this EMPr is to formulate mitigatory measures that should be made binding to all contractors during construction of the proposed development, as well as measures that should be implemented during the operational phase. The point of departure for this EMPr is to take a pro-active route by addressing potential problems before they occur. The EMPr will

also provide management responses that will ensure that the impacts of the development are minimised. 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 EMPr is, therefore, a stand-alone document, which must be used on site during each phase of the development (planning, construction and operational phases).

This document should be flexible so as to allow the contractor and developer to conform to the management commitments without being prescriptive. The management commitments prove that the anticipated risks on the environment will be minimised if they are adhered to consistently. The onus set out in the EMPr rests with the developer, main contractors and subcontractors, which promotes responsibility and commitment. Any parties responsible for transgression of the underlying management measures outlined in this document will be held responsible of non-compliances and will be dealt with accordingly.

It must be noted that DEA in their acknowledgement of the application letter requested specific information to be included in the draft Environmental Management Program. Envirolution has reviewed the letter in line with the nature of the proposed project and the requirements are summarised and responded to as follows:

Draft EMPr requirements	Envirolution Response to the requirements
A plant rescue and protection plan which allows for the maximum transplant of conservation important species from areas to be transformed. This plan must be compiled by a vegetation specialist familiar with the site in consultation with the ECO and be implemented prior to commencement of construction phase	<i>A vegetation assessment was conducted as part of this BA. See BAR Appendix D2. The proposed project will traverse sensitive vegetation groupings that were classified as natural bushveld vegetation as well as riparian and wetland vegetation thus a plant rescue and protection plan will have to be compiled for the construction phase of this project after the final route has been determined.</i>
An open space management plan to be implemented during the construction and operation of the facility	<i>This is a linear project. No plan required due to no open space zoning.</i>
A revegetation and habitat rehabilitation plan to be implemented during construction and operation of the facility including timeframes for restoration which must indicate rehabilitation within the shortest possible time after completion of construction activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats	<i>A wetland rehabilitation plan was conducted as part of this BAR. See BAR Appendix D6.</i>
An alien invasive plan to be implemented during the construction and operation of the facility. The plan must include mitigation measures to reduce the invasion of alien species and ensure that the continuous monitoring and removal of alien	<i>ESKOM have their own minimum standards for bush clearing and maintenance of overhead powerline and servitudes applicable which have been included in this EMPr (BAR Appendix J1.J2 and J3). The requirements outlined in the</i>

species is undertaken	<i>standards will be adhered to during the construction of the powerline.</i>
A storm water management plan to be implemented during construction and operation of the facility. The plan must ensure compliance with applicable legislation and prevent off site migration of contaminated storm water or increased soil erosion. The plan must include the construction of appropriate design measures that allow surface and subsurface movement of water along drainage lines so as not to impede natural surface and subsurface flows. Drainage measures must promote the dissipation of storm water runoff	<i>A storm water plan in the design of the substations is required and must incorporate these requirements in the detailed design drawings.</i>
An effective monitoring system to detect any leakage or spillage of hazardous substances during their transportation, handling, use and storage. This must include precautionary measures to limit the possibility of oil and other toxic liquids from entering the soil or storm water systems.	<i>Mitigation measures for the management and control of soil erosion have been included as part of this draft EMPr</i>
An erosion management plan for monitoring and rehabilitating erosion events associated with the facility. Appropriate erosion mitigation must form part of this plan to prevent and reduce the risk of any potential erosion	<i>Mitigation measures for erosion management have been included as part of this draft EMPr. Also see BAR Appendix J1</i>
A traffic management plan for the site access roads to ensure that no hazard would result from the increased truck traffic and that traffic flow would not be adversely affected. This plan must include measures to minimise impacts on local commuters e.g. limiting construction vehicles travelling on public road ways during the morning and late afternoon commute time and avoid using roads through densely populated build up areas so as not to disturb existing retail and commercial operations	<i>Not required. The proposed distribution line will only have limited increase in traffic during the construction phase.</i>
An environmental sensitivity map indicating environmental sensitive areas and features identified during the EIA process	<i>Included in this EMPr. Also See BAR Appendix A</i>
Measures to protect hydrological features such as streams, rivers, pans, wetlands, dams and their catchments, and other environmental sensitive areas from construction impacts including the direct or indirect spillage of pollutants	<i>A wetland rehabilitation plan was conducted as part of this BAR. See BAR Appendix D6.</i>

The document has been based on the findings of the on site assessment undertaken by Envirolution and the specialist studies. All the Environmental specifications and the procedures discussed in this document were also developed in accordance with the relevant legislation applicable to the development.

This draft Environmental Management Programme was compiled by:

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Ntsanko Ndlovu heads the project team and acts as the Project Manager for all phases of the project. Ntsanko holds an honours degree in Geography from Witwatersrand University and currently on her second year of study for a Masters degree in Environmental Management with North-West University. She is an environmental Scientist with 4 years of professional experience in the consulting field. Ntsanko is currently an Environmental Consultant, based at Envirolution Consulting. She has a wealth of experience in managing Environmental Impact Assessments (EIAs), environmental auditing and conducting environmental awareness, which she gained through the years. She is an Environmental Scientist with 4 years of experience.

2. PHASES OF THE PROJECT

The process which was followed in compiling the EMPr is in compliance with NEMA EIA Regulations (2010), and applies the principle of Integrated Environmental Management (IEM).

The EMPr deals with the following phases as detailed below:

2.1. The Planning Phase

The EMPr offers an ideal opportunity to incorporate pro-active environmental management measures with the goal of attaining sustainable development.

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

2.2. The Construction Phase

The bulk of the impacts during this phase will have immediate effect. 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.

2.3. 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.

3. RESPONSIBILITIES OF THE ROLE PLAYERS

3.1. Developer (Eskom)

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

The developer must ensure that the EMPr is included in the tender documentation so that the contractor who is appointed is bound to the conditions of the EMPr.

The developer must appoint an independent Environmental Control Officer (ECO) during the construction phase to oversee all the environmental aspects relating to the development.

3.2. Contractor

The contractor, as the developer's agent on site, is bound to the EMPr conditions through his/her contract with the developer, and is responsible for ensuring that he adheres to all the conditions of the EMPr. The contractor must thoroughly familiarise him/herself with the EMPr requirements before construction begins and must request clarification on any aspect of these documents, should they be unclear. The contractor must ensure that he/she has provided sufficient budget for complying with all EMPr conditions at the tender stage.

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

3.3. Resident Engineer (RE)

The Resident Engineer (RE) will be appointed by the 'Consultant' and will be required to oversee the construction programme and construction activities performed by the Contractor. The RE is expected to liaise with the Contractor and ECO on environmental matters, as well as any pertinent engineering matters where these may have environmental consequences. He/she will oversee the general compliance of the Contractor with the EMPr and other pertinent site specifications. The RE will also be required to be familiar with the EMPr specifications and further monitor the Contractor's compliance with the Environmental Specifications on a daily basis, through the Site Diary, and enforce compliance.

3.4. The Environmental Control Officer (ECO)

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

- Liaison with relevant authorities;
- Liaison with contractors regarding environmental management; and
- Undertaking routine monitoring and appointing a competent person/institution to be responsible for specialist monitoring, if necessary.

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

(a) Liaison with Authorities

The ECO and Eskom Environmental Representatives will be responsible for liaising with DEA. The ECO must submit environmental audit reports to the authorities should they be required for the project. These audit reports must contain information on the contractor and developer's levels of compliance with the EMPr. The audit report must also include a description of the general state of the site, with specific reference to sensitive areas and areas of non-conformance. The ECO must indicate suggested corrective action measures to eliminate the cause of the non-conformance incidents. In order to keep a record of any impacts, an Environmental Log Sheet (refer to **Appendix 1 of this EMPr**) is to be kept on a continual basis.

(b) Liaison with Contractors

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

3.5. Environmental Liaison Officer (ELO)

The contractor must appoint an Environmental Liaison Officer (ELO) to assist with day-to-day monitoring of the construction activities. Any issues raised by the ECO will be routed to the ELO for the contractors' attention. The ELO shall be permanently on site during the construction phase ensuring daily environmental compliance with the EMPr and should

ideally also be a senior and respected member of the construction crew. Past experience has revealed that, ELO's that can relate to the work force are the most effective for information transfer and ensuring compliance with the EMPr.

All the responsible parties mentioned in this section are responsible for ensuring the implementation of the EMPr and Waste Management Plan (WMP) procedures outlined in the Tables, for the duration of the project.

4. ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

SENSITIVITY MAPS

The EAP and Project specialists have evaluated all potential issues in a corridor of approximately 1000 meters wide. This would allow for fine scale adjustments of the tower positions if required. The following sensitivity maps were generated, Figure 1. , Figure 2. Hydrology Sensitivity and Figure 3. Vegetation Sensitivity

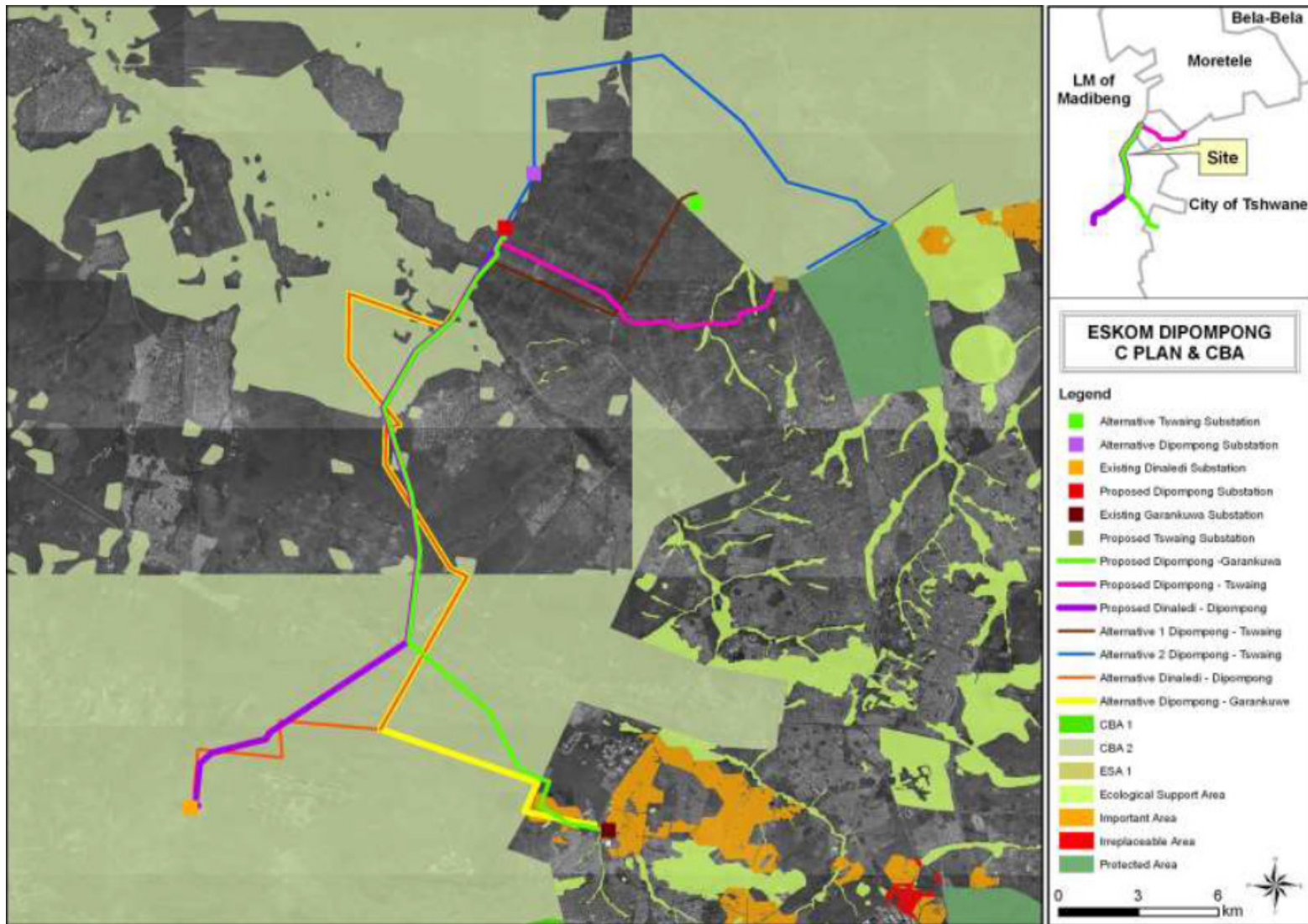


Figure 1. The route alternatives in relation to the Gauteng Conservation Plan and the North West Biodiversity Conservation Assess

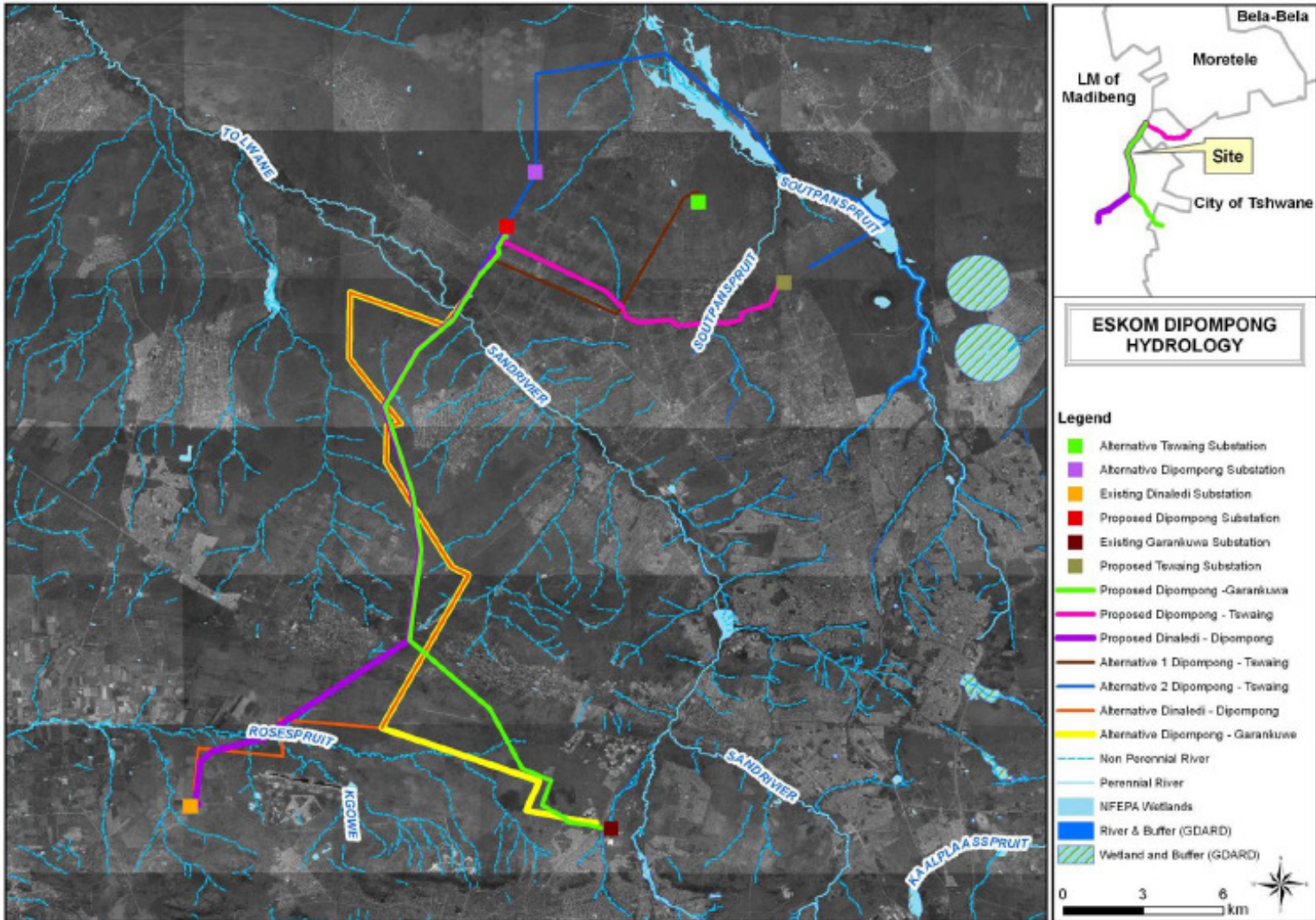


Figure 2. Hydrology Sensitivity

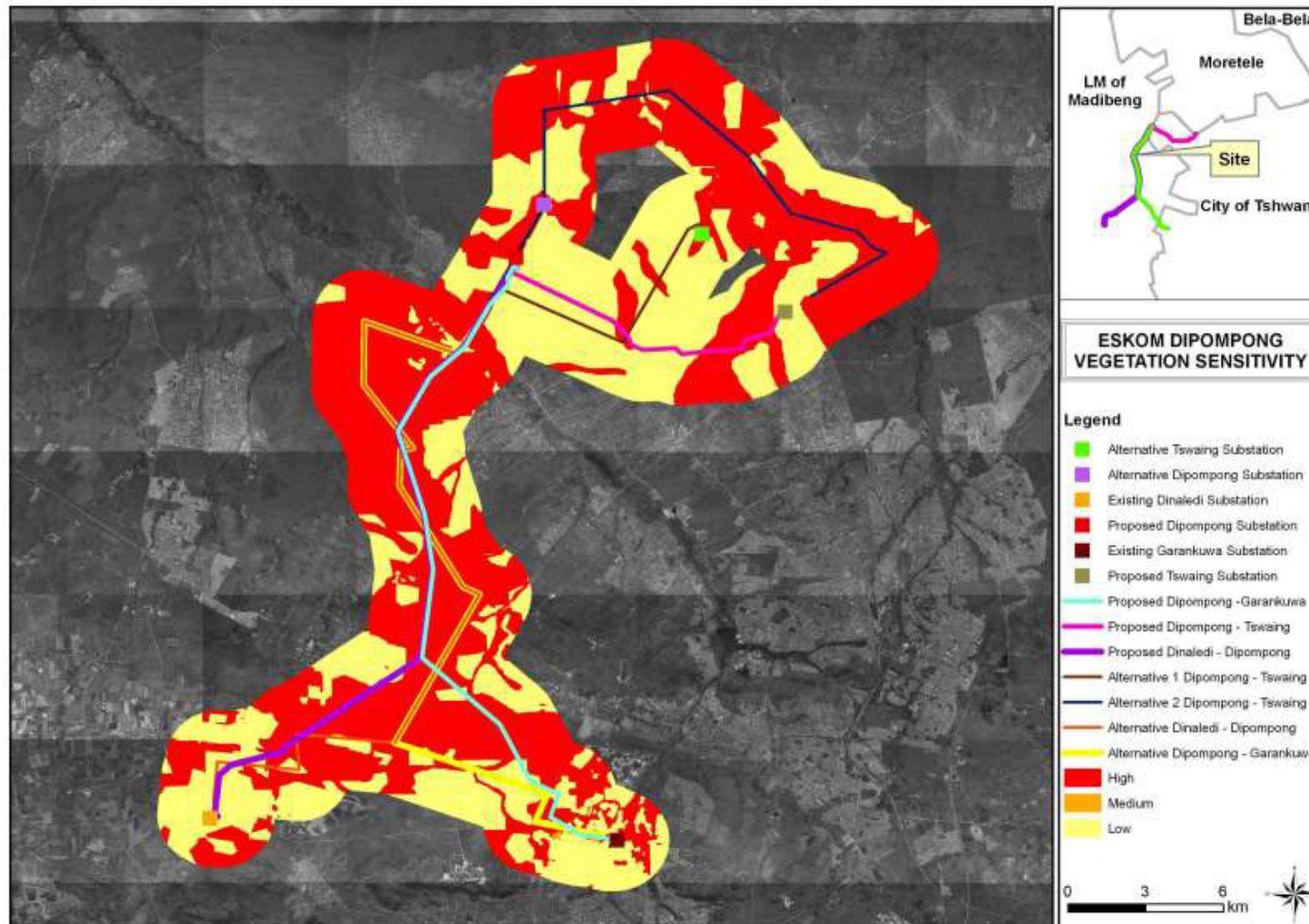


Figure 3. Vegetation Sensitivity

The following table forms the core of this EMPr for the construction and operational phases of the development. This table should be used as a checklist on site, especially during the construction phase. Compliance with this EMPr must be audited during the construction phase and following completion of construction.

PLANNING PHASE EMPr

Table 1: Planning Phase

Activity / issue	Action required	Responsible party	Frequency
Appointment and Duties of ECO	The Developer must appoint an independent Environmental Control Officer (ECO) who must monitor the contractor's compliance with the environmental management plan.	Developer	Once-off
	The developer must provide the ECO and contractor with a copy of the EMPr.	Developer	Once-off
	The priority of the ECO is to maintain the integrity of the development conditions outlined in the EMPr.	ECO	Continuous
	The ECO must form part of the project management team and attend all project meetings.	ECO	Continuous
	The contractor must ensure that the construction crew attend an environmental briefing and training session presented by the ECO prior to commencing activities on site.	ECO, Contractor	Once-off
Appointment and Duties of ELO	The contractor must appoint an Environmental Liaison Officer (ELO). This person will be required to monitor the situation with a direct hands-on approach, and ensure compliance and co-operation of all personnel.	Contractor	Once-off
EMPr	This EMPr must be made binding to the main contractor as well as individual contractors and should be included in tender documentation for the construction contract.	Developer, ECO	Once-off
	All activities on the site must comply with the Tshwane and Madibeng Municipality's By-Laws.	Developer, ECO and Contractor	Continuous
Environmental Protection Plan	Within 21 days of the Commencement Date, the Site Contractor shall prepare and submit to the Project Manager for approval in consultation with the ECO an Environmental Protection Plan. The	Developer, ECO,	Once - off

Activity / issue	Action required	Responsible party	Frequency
	Plan shall cover all environmental protection works and shall also include descriptions of environmental safeguards and emergency procedures.	Contractor	
	The Plan shall include a description of the administrative structure and lines of communication which shall be established between the Contractor's and his subcontractors' workforce for the implementation of environmental protection procedures. Details of the expertise available for the implementation of environmental protection procedures must also be provided.	Contractor, RE, ECO	Once off
	<p>In addition this plan must have a site layout plan and showing the final positions and extent of all permanent and temporary site structures and infrastructure, including:</p> <ul style="list-style-type: none"> • Buildings • Contractors' accommodation. • Contractors' camp • Roads and access routes • Gates and fences. • Essential services (permanent and temporary water, electricity and sewage) • Rubble and waste rock storage and disposal sites. • Site toilets and ablutions. • Firebreaks. • Excavations and trenches. • Topsoil stockpiles. 	Contractor, RE, ECO	Once off

Activity / issue	Action required	Responsible party	Frequency
	<ul style="list-style-type: none"> • Spoil areas. • Construction materials stores. • Vehicle and equipment stores. • Sensitive and No go areas & applicable buffers • All temporary and permanent water management structures including bunds and sumps 		
Permits and Permissions	<p>The Developer shall ensure that all pertinent permits, certificates and permissions have been obtained prior to any activities commencing on site and ensure that they are strictly enforced / adhered to. This includes, for example, updating the Department of Water Affairs (DWA) licence and other monitoring programs if applicable.</p>	Contractor, Developer	Continuous
	<p>The Contractor shall maintain a database of all pertinent permits and permissions required for the contract as a whole and for critical activities for the duration of the contract.</p>	Contractor, Developer	Continuous
Method Statements	<p>The Contractor shall submit written Method Statements to the RE for the activities identified by the RE or ECO. Activities that will require method statements include:</p> <ul style="list-style-type: none"> • Logistics for the Environmental Awareness Training Course • Location and Layout of Construction camp • Construction procedures • Protection of heritage resources (graves, old buildings and 	Contractor, RE, ECO	As necessary

Activity / issue	Action required	Responsible party	Frequency
	bridges) <ul style="list-style-type: none"> • Solid and Hazardous Waste Management • Drainage and Storm water planning • Dust Control • Stockpiling area • Vegetation removal • Materials and equipment to be used • Getting the equipment to and from the site • How the equipment material will be moved while on site • How and where material will be stored • The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur • Timing and location of activities • Compliance/non compliance with Specifications • Site camp establishment • Concrete pre-cast and batching operation • Emergency procedures • Materials, equipment and staffing requirements • Transporting the materials and/or equipment to, from and within the site • Stockpiling of rubble • General and Hazardous waste management on site • The storage provisions for the materials and/or equipment 		

Activity / issue	Action required	Responsible party	Frequency
	<ul style="list-style-type: none"> The proposed construction procedure designed to implement the relevant Environmental Specifications Other information deemed necessary by the RE and/or ECO. <p>Method Statements shall be submitted at least ten working days prior to the proposed commencement of work on an activity to allow the RE (and/or ECO) time to study and approve the method statement.</p>		
	Contractor shall not commence work on that activity until such time as the Method Statement has been approved in writing by the RE contract.	Contractor, RE, ECO	Continuous
	The Contractor shall carry out the activities in accordance with the approved Method Statement.	Contractor, RE, ECO	Continuous
	Under certain circumstances, the RE may require changes to an approved Method Statement. In such cases the proposed changes must be agreed upon in writing between the Contractor and the RE, and appropriate records retained.	Contractor, RE	Continuous
	Approved Method Statements shall be readily available on the site and shall be communicated to all relevant personnel. Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the EMPr specifications.	Contractor, Developer	Continuous

Activity / issue	Action required	Responsible party	Frequency
<p style="text-align: center;">Environmental Awareness and Training</p>	<p>The Contractor shall ensure that all site personnel have a basic level of environmental awareness training. Topics covered should include;</p> <ul style="list-style-type: none"> • What is meant by “Environment” • Why the environment needs to be protected and conserved • How construction activities can impact on the environment • What can be done to mitigate against such impacts • Awareness of emergency and spills response provisions • Social responsibility during construction of the sub-transmission lines e.g. being considerate to local residents <p>- It is the Contractor’s responsibility to provide the site foreman with environmental training and to ensure that the foreman has sufficient understanding to pass this information onto the construction staff.</p> <p>- Training should be provided to other staff members in the use of the appropriate fire-fighting equipment. Translators are to be used where necessary.</p> <p>- Use should be made of environmental awareness posters on site.</p> <p>- The need for a “clean site” policy also needs to be explained to the workers.</p> <p>- Staff operating equipment (such as excavators, loaders, etc.) shall be adequately trained and sensitised to any potential hazards associated with their tasks.</p> <p>The Contractor must monitor the performance of construction workers to ensure that the points relayed during their introduction have been properly understood and are being followed.</p>	<p>Developer, Contractor, ECO</p>	<p>Continuous</p>

Activity / issue	Action required	Responsible party	Frequency
Existing Services and Infrastructure	The Contractor shall ensure that existing services (e.g. roads, pipelines, power lines and telephone services) are not damaged or disrupted.	Contractor, RE, ECO	Continuous.
	The Contractor shall be responsible for the repair and reinstatement of any existing infrastructure that is damaged or services which are interrupted.	Contractor	As necessary
	Such repair or reinstatement will be to the Contractor's cost and shall receive top priority over all other activities.	Contractor	Continuous
	A time limit for the repairs may be stipulated by the RE in consultation with the Contractor.	Contractor, RE, ECO	Continuous
Environmental incidents	The contractor must take corrective action to mitigate an incident appropriate to the nature and scale of the incident and must also rehabilitate any residual environmental damage caused by the incident or by the mitigation measures themselves. All incidents must be reported to the ECO and the developer.	ELO, ECO, Contractor	Continuous

CONSTRUCTION PHASE EMPr

Table 2: Construction Phase

Activity / issue	Action required	Responsible party	Frequency
Site establishment	If construction camp is required in the study area, the contractor must establish a construction camp in an area as agreed with the ECO. The site for the construction camp must not be in an environmentally sensitive area such as close proximity to a watercourse, on a steep slope or on erosive soils. The area must be properly demarcated prior to establishment to prevent the construction camp from being unnecessarily large. The camp must be properly fenced.	ECO, Contractor	Once off
	The working width of the construction area must be clearly demarcated by the installation of coloured pegs prior to construction. Particularly sensitive areas (e.g. river or drainage lines) must be demarcated with danger tape.	ECO, Contractor	Once off, monitor weekly
	The lateral spread of the construction must be monitored on a weekly basis.	ECO, ELO, Contractor	Monitor weekly
	The use of roads on landowner property should be determined based on discussions with landowners during the negotiation process. Letters of agreement with landowners must be kept on a file	ECO, Contractor	Continuous,
	ELO will also be required to monitor unauthorised movement of construction crew.	ELO, Contractor	Once off, monitor daily
	The developer should provide dustbins to be used during site preparation and surveying.	Developer	Once off

Activity / issue	Action required	Responsible party	Frequency
	To prevent excessive disturbance of natural vegetation, the contractor should use existing disturbed or paved areas wherever possible.	ECO, Contractor	Once off, monitor weekly
	To prevent the deterioration of surface water quality, the contractor must provide adequate ablution facilities. However these facilities must not be placed within the vicinity of watercourses. Toilets are to be emptied regularly throughout the construction phase. Every effort must be made to prevent the contamination of surface or sub-surface water.	Contractor	Bi-weekly inspections
Excavation of towers	All excavation (if not working in the area) should be barricaded/covered to prevent safety and environmental accidents	ELO, Contractor	Monitor daily
	Minimise the time taken to complete each operation that is causing inconvenience or disruption in this area.	Contractor	Continuous
	Make temporary access ways over any excavations.	Contractor	Continuous
	To inform property owners of the exact time and duration of closing entrances to any properties at any one time.	Contractor	Continuous
Site Housekeeping	The Construction Site and surrounds are to be maintained in a clean orderly and presentable condition at all times.	Contractor	Monitor Daily
	Regular inspections by the Contractor (and ECO) will be undertaken using checklists to ensure a minimum standard of orderliness is maintained.	Contractor, ECO	Weekly
	Construction activities shall avoid causing unnecessary disruption and nuisance to adjacent landowners and the public as a whole.	Contractor	Continuous

Activity / issue	Action required	Responsible party	Frequency
General: waste	Litter generated by the construction crew must be collected in rubbish bins and disposed of weekly at registered waste disposal sites.	ELO, Contractor	Weekly
	All building and other rubble, solid and liquid waste etc must be disposed of as necessary at an appropriately licensed refuse facility.	ELO, Contractor	Once off, as necessary
	Ensure that no refuse wastes are burnt on the premises or on surrounding premises. No fires will be allowed on site.	ELO, Contractor	Monitor daily
	The construction site must be kept in a clean and orderly state at all times.	Contractor, Construction crew	Monitor daily
	Ensure that no litter, refuse, wastes, rubbish, rubble, debris and builders wastes generated on the premises be placed, dumped or deposited on adjacent/surrounding properties during or after the construction period of the project are disposed of at dumping site as approved by the Council.	ELO, Contractor	Monitor daily - weekly
Fire Prevention and Control	The Contractor shall take all reasonable and precautionary steps to ensure that uncontrolled fires are not started as a consequence of his activities on site. No open fires are allowed on site	Contractor	Daily
	The Contractor shall ensure that there is basic fire-fighting equipment available on site as per requirement of the local Emergency Services.	Contractor, ECO	Continuous

Activity / issue	Action required	Responsible party	Frequency
	<p>The Contractor shall ensure that all site personnel are aware of the fire risks and how to deal with any fires that occur. This shall include, but not be limited to:</p> <ul style="list-style-type: none"> • Regular fire prevention talks • Posting of regular reminders to staff. 	Contractor, ECO	Continuous
	<p>Any fires, which occur, shall be reported to the Environmental Liaison Officer immediately and then to the relevant authorities.</p>	Contractor	Continuous
Emergency Procedures	<p>The Contractor shall submit Method Statements covering the procedures and response plan for the main activities, which could generate emergency situations through accidents or neglect of responsibilities. These situations include, but are not limited to:</p> <ul style="list-style-type: none"> • Accidental fires; • Vehicle and plant accidents; and • Blasting (if required). 	Contractor	As necessary
	<p>The Contractor shall assemble and clearly list the relevant emergency telephone contact numbers for staff and brief staff on the required procedures.</p>	Contractor	Weekly
Hazardous Substances	<p>If potentially hazardous substances are to be stored on site, the Contractor shall provide a Method Statement detailing the substances/materials to be used together with the procedures for the storage, handling and disposal of the materials in a manner which will reduce the risk of pollution that may occur from day to day storage, handling, use and/or from accidental release of any hazardous substances used.</p>	Contractor,	Monitor daily - weekly

Activity / issue	Action required	Responsible party	Frequency
	Hazardous chemical substances (eg. oil, hydrocarbons) used during construction shall be stored in secondary containers.	Contractor	Monitor daily - weekly
	The relevant Material Safety Data Sheets (MSDS) shall be available on Site. Procedures detailed in the MSDS shall be followed in the event of an emergency situation.	Contractor	Monitor daily - weekly
	The waste, resulting from the use of hazardous materials, shall be disposed of at a hazardous waste disposal site as approved by the RE. Storage and disposal of waste is regulated through other legislation, which should be complied with i.e. the Occupational Health and Safety Act. Records for disposal must be kept in the Environmental file	Contractor, RE	Monitor daily - weekly
	Surface water draining off contaminated areas containing oil and petrol would need to be channelled towards a sump which will separate these chemicals and oils.	Contractor, RE	Monitor daily - weekly
	Oil residue shall be treated with oil absorbent such as Drizit or similar and this material removed to an approved waste site.	Contractor, RE	Monitor daily - weekly
Health and Safety	The Contractor shall comply with all standard and legally required health and safety regulations as promulgated under the Occupational Health and Safety Act and associated regulations.	Contractor, RE	Daily
	The Contractor shall provide a standard first aid kit at the site office of each camp and/or at additional identified locations where needed.	Contractor	Daily

Activity / issue	Action required	Responsible party	Frequency
Air Pollution	All forms of dust/air pollution must be managed in terms of the NEMA Air Quality Act (AQA) 2004, (Act 39 of 2004); this includes the control of noxious and offensive gases, smoke, dust and vehicular emissions. Under no circumstances may heavy smoke be released into the air	Developer, Contractor	Daily
Erosion Control	Appropriate flow diversion and erosion control structures i.e. earth embankments must be put in place where soil may be exposed to high levels of erosion due to steep slopes, soil structure etc.	ELO, Contractor	As necessary
	Should a freak storm displace the temporary earth embankments or other erosion control structures, a visual inspection of the site must be made and any damage be recorded. Any damage and loss of soil resulting from a storm is to be remedied immediately. Should the temporary walls collapse due to construction error, the contractor is to fund the remediation process.	ELO, Contractor	As necessary
	Measures must be implemented to distribute storm water as evenly as possible to avoid point sources of erosion.	ELO, Contractor	As necessary
	Construction on steep slopes and in soft or erodable material will require erosion control measures and correct grassing methods.	ELO, Contractor	As necessary
	All construction areas should be suitably top soiled and vegetated as soon as is possible after construction.	ELO, Contractor	Continuous
General: noisy activities	Construction and the use of construction machinery should be limited between 06h00 and 18h00 on weekdays only.	Developer, Contractor	Monitor daily

Activity / issue	Action required	Responsible party	Frequency
	Institute noise control measures throughout the construction phase for all applicable activities, including the construction times.	ELO, Contractor	Once off, as necessary
	Inform residents of nearby residential areas of planned noisy activities outside the timeframes stated above.	ECO, ELO, Contractor	Once off, as necessary
	No construction should occur during weekends, unless the adjacent residents (\pm 1km) have been notified in writing at least three days in advance.	ELO, Contractor	Once off, as necessary
	Construction activities must abide by the national noise laws and the municipal noise by-laws with regard to the abatement of noise caused by mechanical equipment.	Developer, Contractor ELO,	Continual
	Prior to blasting (if required), the contractor must inform the adjacent landowners at least five days in advance.	ELO, Contractor	As necessary
General: activities that can cause dust	Wet all unprotected cleared areas and stockpiles with water to suppress dust pollution during dry and windy periods.	ECO, ELO	Monitor daily
	Ensure proper rehabilitation of disturbed areas in order to minimise bare patches.	ELO, Contractor	Continual
General: Crime, safety and security	Ensure that the construction vehicles are under the control of competent personnel and are in proper working order.	Contractor	Before construction commences & continual
	Ensure that only suitably qualified personnel use construction vehicles.	Contractors	Before construction commences & continual
	Ensure that the contact details of the police or security company and ambulance services are available on site.	Contractor	Once off, monitor weekly

Activity / issue	Action required	Responsible party	Frequency
	Limit access to the construction crew camp to construction workers through access control.	ELO, Contractor	Once off, Continual
	Comply with the requirements of the Occupational Health and Safety Act, 1993 (Act No.85 of 1993) requirements.	ELO, Contractor	Continual
	Vehicular traffic during construction activities must be limited to a maximum speed limit of 30 km/hr.	ELO, Contractor	Continual
	Site notices informing the public of the planned activities must be placed at visible locations a few days prior to any blasting.	ELO, Contractor	As necessary
Stripping of vegetation	The working strip required for the construction of the proposed development must be effectively monitored to prevent excessive vegetation removal. By maintaining the maximum amount of stabilising vegetation, the extent of erosive action will be contained.	ELO, Contractor	Monitor weekly
	Should the construction phase occur in the rainy season, the erection of berms may be necessary in areas prone to erosion (e.g. steep slopes or erosive soils). These bermed areas must be monitored frequently for signs of erosion.	ELO, Contractor	Once off, monitor weekly
	Vegetation to be retained during the construction phase must be clearly demarcated with danger tape.	ELO, Contractor	Once off, as necessary

Activity / issue	Action required	Responsible party	Frequency
Excavation	The topsoil cleared must be retained. The topsoil contains most of the inorganic matter, decomposed organisms and nutrients, thus the removal of the topsoil constitutes a major loss in terms of ecosystem function. In order to ensure that the minimal amount of soil is removed with vegetation clearance, it is strongly advised that vegetation be harvested as close to ground level as possible before earthworks machinery is utilised. Soil removed in this manner will contain the existing seed bank, stolons, rhizomes and runners as well as an additional supply of organic matter that will be beneficial during the early stages of vegetation reinstatement. Harvested grass should be retained and used as a mulch to combat erosion.	ELO, ECO, Contractor	Once off, monitor weekly
	Topsoil and subsoil must be placed on opposite sides of the trench and must be kept separate throughout construction and rehabilitation.	ELO, ECO, Contractor	Monitor weekly
	Topsoil must not be stockpiled for an extensive period (> 3 months). This is to prevent the redundancy of the existing seed bank as well as the alteration of the soil characteristics (permeability, bulk density etc.).	ELO, ECO, Contractor	Monitor weekly
	Erect signs and/or danger tape around the exposed excavations to warn the public of the inherent dangers.	ELO, Contractor	Continual
Removal of excavated material	Trucks removing excavated material can cause compaction of soil if new pathways are created. Vehicles should, therefore, use existing roads. If the creation of new roads is unavoidable, these temporary roads should be ripped and re-vegetated after use.	ECO, Contractor	Monitor weekly

Activity / issue	Action required	Responsible party	Frequency
Stockpiling soil	Ensure that excavated and stockpiled soil material is stored and bermed on the higher lying areas of the site and not in any storm water run-off channels or any other areas where it is likely to cause erosion or where water would naturally accumulate.	ECO, Contractor	Once off, Daily
	The areas where excavated soil will be stockpiled must be bordered by berms to prevent soil loss caused by rain.	ELO, Contractor	Once off, monitor weekly
	Soil stockpiles must not be higher than 2m	ELO, ECO, Contractor	Monitor weekly
Destruction of heritage resources	The contractors and workers should be notified that heritage resources might be exposed during the construction work.	ECO	Once off
	Should any heritage resources be exposed during excavation, work on the area where the heritage resources were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible.	ECO, Contractor	Continuous
	All discoveries shall be reported immediately to the South African Heritage Resources Authority (SAHRA) so that an investigation and evaluation of the finds can be made. Acting upon advice from SAHRA, the Environmental Control Officer will advise the necessary actions to be taken.	ELO, Contractor	Continuous
	Under no circumstances shall any heritage resources be removed or interfered with by anyone on the site unless under the instruction of SAHRA. Destruction of heritage resources is not allowed.	ELO, Contractor	Continuous

Activity / issue	Action required	Responsible party	Frequency
	Contractors and workers shall be advised of the penalties associated with the unlawful removal of heritage resources as set out in section 51(1) of the National Heritage Resources Act (Act No. 25 of 1999).	ECO	Once off
	A person or entity, e.g. the Environmental Control Officer, should be tasked to take responsibility for the heritage resources and should be held accountable for any damage.	Developer	Once off
Protection of Sensitive Environments and Natural Features	Alien species of vegetation should be removed from any working areas and the site camp(s). Alien vegetation species should also be eradicated when they begin to establish themselves in disturbed areas (disturbance of the natural vegetation will encourage the establishment of invasive species). In order to discourage the spread of alien species, soil should not be moved from one part of the site to another without the consent of the ECO.	ECO,ELO, Contractor	Continuous
	Alien and Invasive plant species should be eradicated and managed on the study area according to the Conservation of Agriculture Resources Act (Act no. 43 of 1983) and Section 28 of the National Environmental Management Act, 1998. All areas disturbed as part of the proposed activity will be deemed as the study area.	ECO,ELO, Contractor	Continuous
	Access to any open space system should be controlled to prevent unnecessary disturbances to the residing fauna or vegetation.	ELO, Contractor	Continuous

Activity / issue	Action required	Responsible party	Frequency
	The extent of the construction sites and access roads should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance), and no construction personnel or vehicles may leave the demarcated area except those authorised to do so. Those areas surrounding the construction site that are not part of the demarcated development area should be considered as “no-go” areas for employees, machinery or even visitors.	ELO, Contractor	Continuous
	Measures must be put in place to ensure that the energy of storm-water that is to be released into any watercourse is dissipated.	ELO, Contractor	Continuous
	Remove vegetation only within the minimum width necessary for excavation.	ELO, Contractor	Once off
Aesthetic / visual	Prevent unnecessary removal of vegetation outside the width of the working area by clearly demarcating the working area.	ELO, Contractor	Continual
	Remove vegetation and topsoil and stockpile separately from subsoil prior to excavation.	ELO, Contractor	Continual
	Revegetate disturbed ground in the working area by seeding and spreading of vegetation that has been removed at the start of construction.	ELO, Contractor	Continual
	Killing of birds is not allowed on site	ELO, Contractor	Continual

Activity / issue	Action required	Responsible party	Frequency	
	Establish screening planting along the sides of the substations that front towards the communities.	ELO, Contractor	Once off	
Surface water	Ensure that excavated and stockpiled soil material is stored and bermed on the higher lying areas.	ELO, Contractor	Once off	
	Vegetation clearance must be kept to a minimum to reduce the risk of siltation and be in accordance with Eskom Minimum Standard for vegetation management and erosion control.	ELO, Contractor	Once off	
	Adequate provision must be made for sanitation for the construction workers. Chemical toilets on site are to be emptied weekly.	Developer, Contractor	ECO,	Once off – weekly
	Construction vehicles are to be maintained in good working order, to reduce the probability of leakage of fuels and lubricants. No servicing of vehicles is to be undertaken in close proximity to watercourses.	ELO, Contractor		Once off
	Construction in wetland areas should be undertaken in the presence and/or in consultation with the ECO & ELO.	ELO, Contractor		Continual
Drainage lines, wetlands, pans	All construction activities must remain within the boundaries of the development area, as demarcated at the start of construction. There should be no vehicular access to the drainage lines outside the development area	ELO, Contractor	Continual	
	Wetland areas should be demarcated and marked as “no go “areas	ELO, Contractor, ECO	Continual	

Activity / issue	Action required	Responsible party	Frequency
	Where soil disturbance associated with construction of the power line occurs in the wetland areas, these areas should be suitably top soiled and re-vegetated with appropriate vegetation as soon as is possible after construction.	ELO, Contractor, ECO	Continual
	The wetland areas where the power line will traverse will be occupied by a number of amphibian species, the Giant bullfrog <i>Pyxicephalus adspersus</i> being the most threatened species, A buffer zone must be established of no disturbance around this species occurrence, and owing the breeding habitats of wetlands and pans for this species, care should be taken during the power line's construction phase to not disturb such areas as much as possible.	ELO, Contractor, ECO	Continual
	No water should be abstracted from any drainage lines, wetlands and pans	ELO, Contractor, ECO	Continual
	No stockpile areas should be located within drainage lines, wetlands and pans, or within the associated buffer zone	ELO, Contractor, ECO	Continual
	No hazardous materials (such as oil) should be kept within 50m of the edge of a wetland buffer zone.	ELO, Contractor, ECO	Continual
	No construction camps should be located within the 1:100 year floodline of a watercourse or a wetland.	ELO, Contractor, ECO	Continual

Activity / issue	Action required	Responsible party	Frequency
	No vehicles and access of persons should be allowed through any wetland, except where approved by the relevant authority	ELO, Contractor, ECO	Continual
	Any erosion formed during the construction phase or during the vegetation establishment period shall be backfilled and compacted, and the areas restored to an acceptable condition (>80% vegetation cover).	ELO, Contractor	Continual
	Building materials and fuels should be stored in designated areas where contaminated runoff is contained and disposed of in a responsible manner.	ELO, Contractor	Continual
	The clearing, cutting and removal of trees and areas of natural vegetation must be done in consultation with Eskom Environmental office, ECO and the ELO and relevant permit must be obtained and kept on site	ELO, Contractor, ECO	Continual
Destruction of vegetation	All invader plant species must be removed from the site. Communal landscaping within the development must be done with indigenous vegetation.	ELO, Contractor, ECO	Continual
	Collection of firewood from neighbouring properties is strictly prohibited.	ELO, Contractor, ECO	Continual
	No fires may be ignited with the intent to destroy the flora on site and surrounding properties.	ELO, Contractor, ECO	Continual
	Storm water will be managed according to the Eskom Guidelines for Erosion Control and Vegetation Management.	ELO, Contractor	Continual

Activity / issue	Action required	Responsible party	Frequency
Fauna	<ul style="list-style-type: none"> • All recommendations and mitigation measures provided in the faunal report must be adhered to. • Any animals rescued or recovered will be relocated in suitable habitat away from the power line. • Trees including stumps; bark and holes in trees are vital habitats for numerous arboreal reptiles (chameleons, snakes, agamas, geckos and monitors) • The removal of indigenous and protected tree species (<i>Leadwood Combretum imberbe</i> and <i>Marula Scleroarya birrea</i>) as well as vegetation clearance must be kept to the minimum area required and remain in the existing servitude wherever possible. All pertinent tree permits for the removal of trees must be obtained from the Department of Agriculture Forestry and Fisheries prior removal • It is recommended that when livestock carcasses appear below a power line, or within close proximity it should be moved to 100m away and preferably be placed near "perchable" trees. 	ELO, Contractor, ECO	Continual
Storm water	Onsite treatment will be undertaken through the use of chemical toilets. The toilets will be serviced periodically by the supplier.	ELO, Contractor	Continual

Activity / issue	Action required	Responsible party	Frequency
	<p>Adequate Stormwater Management should be implemented as part of the proposed activity to prevent erosion and sedimentation of the surrounding wetlands, floodplains and rivers:</p> <ul style="list-style-type: none"> • Sheet runoff from access roads should be curtailed; and • Runoff from exposed surfaces should be slowed down by strategic placement of berms. 	ELO, Contractor	Continual
Sewage	All solid waste will be collected at a central location at each construction site and will be stored temporarily until removal to an appropriately permitted landfill site in the vicinity of the construction site.	ELO, Contractor	Continual
Solid waste	Diesel generators will be utilised for the provision of electricity if connections are unavailable.	ELO, Contractor	Continual
Electricity	The contractor must make use of local labour where possible in order to stimulate the local economy.	Contractor	Once off
Recruitment of labour	The contractor must appoint one of his employees to act as an Environmental Liaison Officer. This person will be required to monitor the situation with a direct hands-on approach.	Contractor	Once off
	Eskom and the contractors should maximise the use of local labour where possible by developing a strategy to involve local labour in the contractor teams and construction process.	ELO, Contractor	Once-off

Activity / issue	Action required	Responsible party	Frequency
Social	Before construction commences, representatives from the local authority and community-based organisations, as well as neighbouring and/or affected residents should be informed of the details of the construction company (contractor), size of the workforce and construction schedules.	ELO, Contractor	Once-off
	Local sourcing of materials would assist in providing more economic and employment opportunities for the local people.	ELO, Contractor	As necessary
	A specific contact person should be identified to allow community members and property owners to easily direct their queries and concerns and obtain general information regarding the construction process.	ELO, Contractor	Once-off
	Safety and security measures should be discussed with the property owners and local safety and security structures e.g. the local Community Policing Forums.	ELO, Contractor	Once-off
	Limit the movement of construction vehicles in areas where sensitive receptors are situated e.g. schools and pedestrians.	ELO, Contractor	As necessary
	Eskom should keep the construction of access roads to a minimum and rather use the existing infrastructure, as the construction and maintenance of these roads are very costly, impact on the residents' daily living and movement patterns, and create a potential for erosion.	ELO, Contractor	As necessary

Activity / issue	Action required	Responsible party	Frequency

OPERATIONAL PHASE EMPr

Table 3: Operational Phase

Activity / issue	Action required	Responsible party	Frequency
General	A maintenance plan for the distribution line must be developed to ensuring that good working order is achieved.	Developer	Once-off
Protection of Sensitive Environments and Natural Features	Alien species of vegetation should be removed from any working areas and the site camp(s). Alien vegetation species should also be eradicated when they begin to establish themselves in disturbed areas (disturbance of the natural vegetation will encourage the establishment of invasive species). In order to discourage the spread of alien species, soil should not be moved from one part of the site to another without the consent of the ECO.	ELO, Contractor, ECO	As necessary
	A monitoring programme should be implemented to enforce the continual eradication of alien and invasive species, especially along wetland and areas corresponding of primary grassland.	Developer	As necessary
	Checks must be carried out at regular intervals to identify areas where erosion is occurring. Appropriate remedial actions, including the rehabilitation of the eroded areas are to be undertaken.	Developer	As necessary
Vegetation	Re-vegetated sites should be monitored for invasion by alien seedlings on a regular basis. Such seedlings should be removed by hand.	Developer	Continuous
	Care must be taken all the time when applying the herbicide to remove aliens	Developer	Continuous

Activity / issue	Action required	Responsible party	Frequency
	Screen planting that was specifically established to minimise the intrusiveness of the power line or substation must be maintained and dead or sick plants replaced for a determinate period after construction.	Developer	Continuous
	Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to.	Developer	Continuous
	Plants that are not interfering with the operation of the powerline during the maintenance must not be disturbed.	Developer	Continuous
Health & Safety	An emergency plan (including fire management) must be developed and implemented. Ensure that all fire extinguishers are replaced on or before their expiry dates.	Developer	Continuous
	Site Safety checks should be carried out in accordance with the pertinent Occupational Health and Safety requirements prior to site closure.	Developer	Continuous
	Telephone numbers of emergency services shall be posted conspicuously in the office for use in emergency situations	Developer	Continuous
Social	Conditions stipulated by property owners in terms of the construction activities should be implemented and monitored.	Developer	Continuous
	Where local skills are not available for the operation and maintenance of the line, Eskom should consider capacity building and training to ensure that locals are employable.	Developer	Continuous

Activity / issue	Action required	Responsible party	Frequency
	Careful consideration should be given to the tower designs in order to minimise impacts on existing structures and activities on affected properties.	Developer	Continuous
	It is recommended that Eskom implements a skills audit and develops a skills database.	Developer	Continuous
Erosion control	Storm water should be managed according to the Eskom Guidelines for Erosion Control and Vegetation Management.	Developer	Continuous

6. CONCLUSION

Provided this project is mitigated, as per the EMPr, the project will result in limited negative environmental impacts that can be mitigated through implementation of this EMPr. It is the applicant's responsibility to ensure that this EMPr is made binding on the contractor by including the EMPr in the contract documentation. The contractor must thoroughly familiarise himself with the requirements of the EMPr and appoint an environmental liaison officer (ELO) to oversee the implementation of the EMPr on a day-to-day basis.

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.

Key issues

- The Contractor and Developer must continuously apply all the relevant requirements by the OHS Act and other legislations;
- Proper warning tape (e.g. orange danger nets) must be erected to inform public of the inherent dangers; and
- Should blasting activities be required on certain areas during foundations excavations, it is important the relevant permits be obtained and that the adjacent landowners are informed of these planned activities five days in advance and that site notices informing the public are strategically placed at visible locations.

APPENDIX 1: AN EXAMPLE OF INCIDENT AND ENVIRONMENTAL LOG

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

