**Borutho (MTS) Project: Environmental Management Programme**

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**GLOSSARY**

**EMPr:**

Environmental Management Programme: A detailed plan of action prepared to ensure that recommendations for enhancing or ensuring positive impacts and limiting or preventing negative environmental impacts are implemented during the life-cycle of a project. This Environmental Management Plan should preferable form part of Eskom's Environmental Management System and ISO 14001 standard compliance system if this has been instituted.

**ENVIRONMENT:**

In terms of the National Environmental Management Act (NEMA) (No 107 of 1998), "environment" means the surroundings within which humans exist and that are made up of:

(i) the land, water and atmosphere of the earth;

(ii) micro-organisms, plant and animal life;

(iii) any part or combination of (i) of (ii) and the interrelationships among and between them; and

(iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

**ENVIRONMENTAL CONTROL OFFICER:**

An individual nominated through the Project Coordinator to be present on site to act on behalf of the Project Coordinator in matters concerning the implementation and day to day monitoring of the EMPr.

**CONTRACTOR:**

A person or company appointed by Eskom to carry out stipulated activities

**REHABILITATION:**

Rehabilitation is defined as the return of a disturbed area to a state which approximates the state (where possible) which it was before disruption. Rehabilitation for the purposes of this specification is aimed at post-reinstatement re-vegetation of a disturbed area and the insurance of a stable land surface. Re-vegetation should aim to accelerate the natural succession processes so that the plant community develops in the desired way, i.e. promote rapid vegetation establishment.

## DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

According to regulation 33 of GN R 543, an environmental management programme must include:

(a) details of –

(i) the person who prepared the environmental management programme; and

(ii) the expertise of that person to prepare an environmental management

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MOKWALE CONSULTING was established in March 2005 with the sole aim of improving people's lives.

Mokwale Consulting concentrates mainly on social and environmental aspects. We do consultancy on any project that requires social facilitation and environmental impact assessment. This usually happens where there are processes that take place in places where local people and other stakeholders have to be fully involved and engaged to ensure sufficient service delivery.

Mokwale Consulting is committed to professional integrity and strive, as Consultants, to deliver service of quality to our clients and employers. We render the following services to our clients and/or employers:

- Environmental Impact Assessments and Environmental Management Programmes
- Social facilitation
- Geo-technical Study and Geo-hydrological Study
- Strategic and Environmental Management Framework
- Waste Management Plan
- Landfill Management

Mokwale Job Mamaganyane, Director at Mokwale Consulting, he holds the following qualifications:

- N.Dip. Economic Management Analysis- TUT (Tshwane University of Technology)(2001 – 2003)
- Dip. Project Management (Damelin) (2005)
- Cert: Geographical Information System (GIS) – University of Venda (2006)
- Cert: Environmental Impact Assessment (EIA) – University of Venda (2008 & 2009)
- Dipl. Mining Impact & Post Mining Rehabilitation - University of Venda

Has gathered an intensive experience when working on other projects with other companies and within Mokwale itself. He is a founder member and oversees projects and processes within the company. He concentrated entirely on Environmental Studies and Social facilitation processes

The following are some of the projects he facilitated for:

- Social facilitation for construction of Apel Taxi Rank and Mphemasedi Centre for the Disabled of Sekhukhune Cluster Projects under Greater Sekhukhune District Municipality.
- Project manager for Construction of 475 VIP toilets in Machacha under Greater Sekhukhune District Municipality.
- Feasiability Study for Intergrated Energy Centre in the Mutale area for SASOL SA (2003/2004) under Vhembe District Municipality.

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Peter Mokganya: Environmental Consultant at Mokwale Consulting holds a National Diploma in Environmental Management from Tshwane University of Technology. He also has an advanced certificate in Geographical Information Systems from University of Johannesburg. He has 10 year experience in the environmental impact assessment filed.

## 1. INTRODUCTION

Eskom Holdings Limited (Eskom) is mandated by the South African Government to ensure the provision of reliable and affordable power to South Africa. Eskom currently generates approximately 95% of the electricity used in South Africa. Electricity cannot be stored and must be used as it is generated. Therefore, electricity must be generated in accordance with supply-demand requirements. Eskom's core business is in the generation, transmission (transport), trading and retail of electricity. In terms of the Energy Policy of South Africa "energy is the lifeblood of development". Therefore, the reliable provision of electricity by Eskom is critical for industrial development and related employment and sustainable development in South Africa.

It is important that better precautions be taken to ensure that project activities do not result in environmental damage and that any environmental impacts are minimised and managed. This will require a concerted effort from the Contractor appointed by Eskom, as well as by Eskom itself during operation of the powerlines. This EMPr is designed to assist in this objective and to ensure that proper planning is undertaken. This EMPr has also been compiled to provide recommendations and guidelines to which compliance monitoring can be done during the construction of the powerlines as well as to ensure that all relevant factors are considered to ensure for environmentally responsible development. The EMPr will be strictly implemented during the construction of the Powerlines and will be reviewed regularly during the lifespan of the project until decommissioning for updating where necessary. It is important to note that this EMPr is a "living" document and should be reviewed on a regular basis.

### 1.1 Project description

Proposed construction of Barutho major transmission station is as follows:

1. Construction of approximately 10km 132kV Loop in Loop out power line from the existing Witkop PPRust 132kV power line to the proposed Mokopane MTS

2. Construction of approximately 10km 132kV Loop in Loop out power line from the existing Witkop Sandsloot 132kV power line to the proposed Mokopane MTS

3. Construction of approximately 28km 132kV power line from the existing potties substation to the proposed Mokopane MTS

### 1.2 Applicable Documentation

The following documentation is applicable for the project, and should be read in conjunction with this EMPr:

- Basic Assessment (BA) Report for the proposed Construction of the Transmission station
- Environmental Authorisation issued by the Department of Environmental Affairs, (once issued).

## 2. PROJECT RESPONSIBILITIES

Several professionals will form part of the project team. The most important from an environmental perspective are the Project Manager, the Environmental Control Officer (ECO), Eskom and the contractor. The Project Manager is responsible for the implementation of the EMPr on the site during the Construction phase of the project. The ECO is responsible for monitoring the implementation of the EMPr during the construction phase of the project. Eskom's contractor is responsible for the implementation of the EMPr during the Construction, Operational and Decommissioning phases of the project. Decommissioning will however entail the appointment of a new professional team and responsibilities will be similar to those during the design, pre-construction and construction phases. It is unlikely that the Powerlines will be decommissioned for several years.

### 2.1 Project Manager

The Project Manager is responsible for overall management of project and EMPr monitoring. The following tasks will fall within his / her responsibilities:

- Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures.
- Conduct internal audits of the construction site against the EMPr.
- Confine the construction site to the demarcated area.
- Rectify transgressions through the implementation of corrective action.

### 2.2 Environmental Control Officer

The Environmental Control Officer is responsible for the monitoring of the EMPr during the construction phase as well as liaison and reporting to Eskom, Contractor, Landowners and Authorities. The following tasks will fall within his / her responsibilities:

- Be familiar with the recommendations and mitigation measures of this EMPr.
- Conduct weekly / monthly audits of the construction site according to the EMPr.
- Educate the construction team about the management measures of the EMPr.
- Regular liaison with the construction team and the project leader.
- Recommend corrective action for any environmental non-compliance incidents on the construction site.
- Compile a regular report highlighting any non-compliance issues as well as good compliance with the EMPr.
- All negotiations for any reason shall be between the ECO, Eskom, affected parties (landowners) and the Contractor. No verbal agreements shall be made.
- All agreements shall be recorded in writing and all parties shall co-sign the documentation.
- The affected parties shall always be kept informed about any changes to the construction programme should they be involved. If the ECO is not on site the Contractor should keep the affected parties informed. The contact numbers of the Contractor and the ECO shall be made available to the affected parties. This will ensure open channels of communication and prompt response to queries and claims.

### 2.3 Contractor

The contractor is responsible for the implementation and compliance with recommendations and conditions of the EMPr. Ensure compliance with the EMPr at all times during construction activities. Maintain an environmental register which keeps a record of all incidents which occur on the site during construction of the powerlines. These incidents include:

- Public involvement / complaints
- Health and safety incidents
- Incidents involving Hazardous materials stored on site
- Noncompliance incidents

## 3. THE ENVIRONMENTAL MANAGEMENT PROGRAMME

This EMPr seeks to manage and keep to a minimum the negative impacts of a development and at the same time, enhance the positive and beneficial impacts.

### 3.1 Objectives of the EMPr

The objectives of the EMPr are to:

- Identify a range of mitigation measures which could reduce and mitigate the potential impacts to minimal or insignificant levels.
- To identify measures that could optimize beneficial impacts.
- To create management structures that addresses the concerns and complaints of I&APs with regards to the construction that will take place.
- To establish a method of monitoring and auditing environmental management practices during all phases of the construction.
- Ensure that the construction and operational phases of the project continues within the principles of Integrated Environmental Management.
- Detail specific actions deemed necessary to assist in mitigating the environmental impact of the powerlines.
- Ensure that the safety recommendations are complied with.
- Propose mechanisms for monitoring compliance with the EMPr and reporting thereon.
- Specify time periods within which the measures contemplated in the final environmental management plan must be implemented, where appropriate.

### 3.2 Emphasis of the EMPr

- Avoiding impacts by not performing certain actions.
- Minimising impacts by limiting aspects of an action.
- Rectifying impacts through rehabilitation, restoration, etc of the affected environment.
- Compensating for impacts by providing substitute resources or environments
- Minimising impacts by optimising processes, structural elements and other design features.
- Provide ongoing monitoring and management of environmental impacts of a development and documenting of any digressions /good performances.
- The EMPr is a legally binding document that all parties involved in the project must be aware of.

### 3.3 Environmental Monitoring

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

- Bi-weekly monitoring during first month where after monthly audits will be conducted by the Environmental Control Officer to ensure compliance to the EMPr conditions, and where necessary make recommendations for corrective action.

These audits can be conducted randomly and do not require prior arrangement with the project manager.

- Compilation of an audit report with a rating of compliance with the EMPr. The ECO shall keep a photographic record of any damage to areas outside the demarcated site area. The date, time of damage, type of damage and reason for the damage shall be recorded in full to ensure the responsible party is held liable. All claims for compensation emanating from damage should be directed to the ECO for appraisal. The Contractor shall be held liable for all unnecessary damage to the environment. A register shall be kept of all complaints from the Landowner or community. All complaints / claims shall be handled immediately to ensure timeous rectification / payment by the responsible party.

### 3.4 Compliance with the EMPr

A copy of the EMPr must be kept on site during the construction period at all times.

The EMPr will be made binding on all contractors operating on the site and must be included within the Contractual Clauses. It should be noted that in terms of the National Environmental Management Act No 107 of 1998 (Section 28) those responsible for environmental damage must pay the repair costs both to the environment and human health and the preventative measures to reduce or prevent further pollution and/or environmental damage (The polluter pays principle).

### 3.5 Training of Construction Workers

The construction Workers must receive basic training in environmental awareness, including the storage and handling of hazardous substances, minimization of disturbance to sensitive areas, management of waste, and prevention of water pollution.

### 3.6 Contractor Performance

The Contractor must ensure that the conditions of the EMPr are adhered to. Should the Contractor require clarity on any aspect of the EMPr, the Contractor must contact the ECO for advice.

## 4. LEGISLATION

The following environmental legislation is applicable to the proposed project.

- Constitution of South Africa (Act No. 108 of 1996)
- National Environmental Management Act (Act No 107 of 1998) – NEMA
- National Heritage Resources Act (Act No 25 of 1999)
- National Water Act (Act No 36 of 1998)
- Hazardous Substances Act (Act No. 15 of 1973)
- Protected species – provincial ordinances
- National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
- Occupational Health and Safety Act (Act No 85 of 1993)
- National Environmental Management: Air Quality Act (Act No. 39 of 2004)
- Fencing Act 31 of 1963
- National Building Regulations and Building Standards Act 103 of 1977

## 5. ENVIRONMENTAL MANAGEMENT PROGRAMME: CONSTRUCTION PHASE

### 5.1 Site Clearing

According to the Ecological study conducted by Dr Wynand Vlok on the proposed site for development, several protected trees were identified: *Boscia albitrunca, Combretum imberbe, Accacia erioloba and Schlerocarya birrea*. The report also concluded that there is a list of possible red data species in the study area as follows: *Brachystelma inconspcuum; Argyrolobium muddii; Gladiolus dolomiticus; Brachystelma hirtellum; Elaeodendron transvaallense; Curtis dentate; Euphorbis clivicola; Bowiea volubilis; Adenia fruticosa; Prunus Africana*. These trees species must be observed during construction period.

### 5.2 Site establishment

Site establishment shall take place in an orderly manner and all required amenities shall be installed at Camp sites before the main workforce move onto site. The Construction camp shall have the necessary ablution facilities with chemical toilets at commencement of construction activities. The Contractor shall inform all site staff to make use of supplied ablution facilities and under no circumstances shall indiscriminate sanitary activities be allowed other than in supplied facilities. The Contractor shall supply waste collection bins where such is not available and all solid waste collected shall be disposed of at a registered landfill. A certificate of disposal shall be obtained by the Contractor and kept on file. Where a registered waste site is not available close to the construction site, the Contractor shall provide a method statement with regard to waste management. The disposal of waste shall be in accordance with all relevant legislation. Under no circumstances may solid waste be burnt on site.

**Table 1: Construction traffic and access**

| Phase | Mitigation | Responsibility | Frequency/Monitoring requirements |
|---|---|---|---|
| **Construction** | **Construction traffic**<br>• Caution during construction is needed and only existing roads must be used<br>• Construction routes must be clearly defined.<br>• Access of all construction and material delivery vehicles should be strictly controlled, especially during wet weather to avoid compaction and damage to the topsoil structure.<br>• Wheel washing and damping down of un-surfaced roads must be implemented to reduce dust.<br>• Vehicles and equipment shall be serviced regularly to avoid the contamination of soil from oil and hydraulic fluid leaks etc.<br>• Servicing must be done off-site.<br>• Soils compacted by construction shall be deep ripped to loosen compacted layers and re-graded to even running levels.<br>**Access**<br>• Temporary access roads that might be required must be rehabilitated prior to the contractor leaving the site. Should these roads trigger the threshold specified in the EIA Regulation, Environmental Authorisation must be obtained.<br>• Strategic positioning of entry and exit points to ensure as little impact/ effect as possible on the traffic flow.<br>• The main routes to the site must be clearly signposted.<br>• Planning of temporal access routes to the site for construction purposes shall be done in conjunction between the Contractor, Eskom and the Landowner. All agreements reached should be documented and no verbal agreements should be made. The Contractor shall clearly mark all access roads.<br>• 14. Where new access roads are constructed, this must be done according to design and contract specifications. Drainage channels shall be suitably designed to ensure erosion does not occur, especially at the outflow points. The new access road shall be designed to allow for the natural flow of water where required. Crossing of dongas and eroded areas on access routes to new sites shall be thoroughly planned and installed according to design and contract specifications. All areas susceptible to erosion shall be protected with suitable erosion control measures from the onset of the project. Prevention is the ultimate aim, as restoration is normally very difficult and costly. | Main Contractor, ECO | Continuous |

| | | | |
|---|---|---|---|
| | **Road maintenance**<br>• Contractors should ensure that access roads are maintained in good condition by attending to potholes, corrugations and stormwater damage as soon as these develop.<br>**General**<br>• The Contractor shall meet safety requirements under all circumstances. All equipment transported shall be clearly labelled as to their potential hazards according required safety labelling on the containers and trucks used shall be in place.<br>• The Contractor shall meet these safety requirements under all circumstances. All equipment transported shall be clearly labelled as to their potential hazards according to specifications. All the required safety labelling on the containers and trucks used shall be in place.<br>• The Contractor shall ensure that all the necessary precautions against damage to the environment and injury to persons are taken in the event of an accident | | |

**Table 2: Construction Camp**

| Phase | Mitigation | Responsibility | Frequency/Monitoring requirements |
|---|---|---|---|
| **Construction** | **Site of construction camp**<br>• Choice of site for the Contractor's camp requires the ECOs permission and must take into account location of local residents and / or ecologically sensitive areas, including flood zones and slip / unstable zones. A site plan must be submitted to the ECO and project manager for approval.<br>• The construction camp may not be situated within the 1:100 year flood line or on slopes greater that 1:3.<br>• If the Contractor chooses to locate the camp site on private land, he must get prior permission from both the project manager and the landowner<br>• The size of the construction camp should be minimized (especially where natural vegetation or grassland has had to be cleared for its construction).<br>• Adequate parking must be provided for site staff and visitors. This should not inconvenience or serve as a nuisance for neighbours. | Main Contractor, ECO | Weekly |

| Phase | Mitigation | Responsibility | Frequency/Monitoring requirements |
|---|---|---|---|
| | • The Contractor must attend to drainage of the camp site to avoid standing water and / or sheet erosion.<br>• Suitable control measures over the Contractor's yard, plant and material storage to mitigate any visual impact of the construction activity must be implemented.<br>• No development, or activity of any sort associated with camp, is allowed below the 1:100 year flood line of any water system. Storage of materials (including hazardous materials)<br>• Choice of location for storage areas must take into account prevailing winds, distances to water bodies, general onsite topography and water erosion potential of the soil. Impervious surfaces must be provided where necessary.<br>• Storage areas must be designated, demarcated and fenced.<br>• Storage areas should be secure so as to minimize the risk of crime. They should also be safe from access by unauthorised persons.<br>• Fire prevention facilities must be present at all storage facilities.<br>• Proper storage facilities for the storage of oils, paints, grease, fuels, chemicals and any hazardous materials to be used must be provided to prevent the migration of spillage into the ground and groundwater regime around the temporary storage area(s). These pollution prevention measures for storage should include a bund wall high enough to contain at least 110% of any stored volume, and this should be sited away from drainage lines in a site with the approval of the ECO.<br>• These storage facilities (including any tanks) must be on an impermeable surface that is protected from the ingress of storm water from surrounding areas in order to ensure that accidental spillage does not pollute local soil or water resources.<br>• Clear signage must be placed at all storage areas containing hazardous substances / materials.<br>• Staff dealing with these materials / substances must be aware of their potential impacts and follow the appropriate safety measures.<br>• The contractor must ensure that its staff is made aware of the health risks associated with any hazardous substances used and has been provided with the appropriate protective clothing/equipment in case of spillages or accidents and have received the necessary training.<br>• All excess cement and concrete mixes are to be contained on the construction site prior to disposal off site. | | |

| Phase | Mitigation | Responsibility | Frequency/Monitoring requirements |
|---|---|---|---|
| | • Major spillage, which may occur, shall be investigated and immediate action must be taken. This must also be reported to the ECO and DWAF, as well as local authorities if so required.<br><br>**Drainage of construction camp**<br>• Run-off from the camp site must NOT discharge into neighbours' properties or into adjacent wetlands, rivers or streams.<br>**End of construction**<br>• Once construction has been completed on site and all excess material has been removed, the storage area shall be rehabilitated. If the area was badly damaged, re-seeding shall be done.<br>• Such areas shall be rehabilitated to their natural state. Any spilled concrete shall be removed and soil compacted during construction shall be ripped, levelled and re-vegetated. | | |

**Table 3: Environmental Education and Training**

| Phase | Mitigation | Responsibility | Frequency/Monitoring requirements |
|---|---|---|---|
| **Construction** | **Environmental training**<br>1. Ensure that all site personnel have a basic level of environmental awareness training. Topics covered should include;<br>• What is meant by "Environment"<br>• Why the environment needs to be protected and conserved<br>• How construction activities can impact on the environment<br>• What can be done to mitigate against such impacts<br>• Awareness of emergency and spills response provisions<br>• Social responsibility during construction of the powerlines e.g. being considerate to local residents | Main Contractor, ECO | Monthly |

| Phase | Mitigation | Responsibility | Frequency/Monitoring requirements |
|---|---|---|---|
| | • 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.<br>• Training should be provided to the staff members in the use of the appropriate fire-fighting equipment. Translators are to be used where necessary.<br>• Use should be made of environmental awareness posters on site.<br>• The need for a "clean site" policy also needs to be explained to the workers.<br>• Staff operating equipment (such as excavators, loaders, etc.) shall be adequately trained and sensitised to any potential hazard associated with their tasks.<br>**Monitoring of environmental training**<br>• 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. | | |

**Table 4: Soils**

| Phase | Mitigation | Responsibility | Frequency/Monitoring requirements |
|---|---|---|---|
| **Construction** | **Topsoil**<br>• The contractor should, prior to the commencement of earthworks determine the average depth of topsoil, and agree on this with the ECO. The full depth of topsoil should be stripped from areas affected by construction and related activities prior to the commencement of major earthworks. This should include the building footprints, working areas and storage areas. Topsoil must be reused where possible to rehabilitate disturbed areas.<br>• Care must be taken not to mix topsoil and subsoil during stripping.<br>• Removed polluted topsoil should be transported to a licensed landfill site.<br>**Soil Stripping**<br>• No soil stripping must take place on areas within the site that the contractor does not require for construction works or areas of retained vegetation.<br>• Construction vehicles must only be allowed to utilise existing tracks or pre-planned access routes.<br>**Fuel storage**<br>• It is recommended that fuel and oil must not be stored on site during the construction phase and that containment dams or berms are constructed around transformers.<br>• Topsoil and subsoil to be protected from contamination.<br>• Cement, concrete and chemicals must be mixed on an impermeable surface and provisions should be made to contain spillages or overflows into the soil.<br>• Any storage tanks containing hazardous materials must be placed in banded containment areas with sealed surfaces. The bund walls must be high enough to contain 110% of the total volume of the stored hazardous material.<br>**Concrete mixing (if required)**<br>• Concrete mixing must be contained within a bundled area.<br>• Concrete mixing must only take place within designated areas. | ECO, Main Contractor | Monthly |

| Phase | Mitigation | Responsibility | Frequency/Monitoring requirements |
|---|---|---|---|
| | • Ready mixed concrete must be utilised where possible.<br>• No vehicles transporting concrete to the site may be washed on site.<br>• If a batching plant is necessary, run-off should be managed effectively to avoid contamination of other areas of the site. Untreated run-off from the batch plant must not be allowed to get into the storm water system or any rivers, streams, wetlands or existing erosion channels / dongas.<br>**Earthworks**<br>• Soils compacted during the construction of the line should be deeply ripped to loosened compacted layers and re-graded to even running levels. Topsoil should be re-spread over landscaped areas. According to specifications by the Eskom's landscape architect the area should be re-vegetated upon completion of construction activities. | | |

**Table 5: Erosion Control**

| Phase | Mitigation | Responsibility | Frequency/Monitoring requirements |
|---|---|---|---|
| **Construction** | 1. Wind screening and stormwater control should be undertaken to prevent soil loss from the site.<br>2. The use of silt fences and sand bags must be implemented in areas that are susceptible to erosion.<br>3. Other erosion control measures that can be implemented are as follows:<br>• Brush packing with cleared vegetation<br>• Mulch or chip packing<br>• Planting of vegetation<br>• Hydroseeding / hand sowing<br>4. All erosion control mechanisms need to be regularly maintained.<br>5. Seeding of topsoil and subsoil stockpiles to prevent wind and water erosion of soil surfaces.<br>6. Retention of vegetation where possible to avoid soil erosion.<br>7. Vegetation clearance should be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time.<br>8. Re-vegetation of disturbed surfaces should occur immediately after the construction activities are completed.<br>9. No impediment to the natural water flow other than approved erosion control works is permitted.<br>10. To prevent stormwater damage, the increase in stormwater runoff resulting from construction activities must be estimated and the drainage system assessed accordingly. A drainage plan must be submitted to the ECO for approval and must include the location and design criteria of any temporary stream crossings. | ECO, Main Contractor | Bi-Monthly |

**Table 6: Ground and Surface Water Pollution**

| Phase | Mitigation | Responsibility | Frequency/Monitoring requirements |
|---|---|---|---|
| **Construction** | **Sanitation**<br>• Adequate sanitary facilities and ablutions must be provided for construction workers<br>• The facilities must be regularly serviced and emptied to reduce the risk of surface or groundwater pollution.<br>**Hazardous materials**<br>• Use and or storage of materials, fuels and chemicals which could potentially leak into the ground must be controlled.<br>• All storage tanks containing hazardous materials must be placed in banded containment areas with sealed surfaces. The bund wall must be high enough to contain 110% of the total volume of the stored hazardous material with an additional allocation for potential stormwater events.<br>• Any hazardous substances must be stored at least 20m from any of the water bodies on site.<br>• The Environmental Control Officer should be responsible for ensuring that potentially harmful materials are properly stored in a dry, secure, ventilated environment, with concrete or sealed flooring and a means of preventing unauthorised entry.<br>• Contaminated wastewater must be managed by the Contractor to ensure existing water resources on the site are not contaminated. All wastewater from general activities in the camp shall be collected and removed from the site for appropriate disposal at a licensed commercial facility.<br>**Cement mixing**<br>• Cement contaminated water must not enter the water system as this disturbs the natural acidity of the soil and affects plant growth.<br>**Public areas**<br>• Food preparation areas should be provided at the construction camp with adequate washing facilities and food refuse should be stored in sealed refuse bins which should be removed from site on a regular basis.<br>• The contractor should take steps to ensure that littering by construction workers does not occur and persons should be employed on site to collect litter from the site and immediate surroundings, including litter accumulating at fence lines.<br>**Water resources**<br>• Site staff shall not be permitted to use any other open water body or natural water source adjacent to or within the designated | ECO, Main Contractor | Weekly |

| Phase | Mitigation | Responsibility | Frequency/Monitoring requirements |
|---|---|---|---|
| | site for the purposes of bathing, washing of clothing or for any construction or related activities.<br>• Municipal water (or another source approved by the ECO) should instead be used for all activities such as washing of equipment or disposal of any type of waste, dust suppression, concrete mixing, compacting, etc.<br>• Proper compaction of backfilled material to attain low permeability.<br>• Ensure that surface/storm water is diverted away from excavation trenches.<br>• If necessary ensure that stream flow bypasses the construction area within drainage lines.<br>• Shape backfilling of trench in such a way that water ponding and erosion of backfilled trench are avoided.<br>• Ensure that contaminants are safely stored and away from the construction site. | | |

**Table 7: Hydrology and Stormwater**

| Phase | Mitigation | Responsibility | Frequency/Monitoring requirements |
|---|---|---|---|
| **Construction** | • The site must be managed in order to prevent pollution of drains, downstream watercourses or groundwater, due to suspended solids, silt or chemical pollutants.<br>• Silt fences should be used to prevent any soil entering the stormwater drains.<br>• Temporary cut of drains and berms may be required to capture stormwater and promote infiltration.<br>• Promote water saving mind set with construction workers in order to ensure less water wastage.<br>• New stormwater infrastructure construction must be developed strictly according to specifications from ECO in order to ensure efficiency.<br>• Hazardous substances must be stored at least 20m away from the buffer area surrounding any water bodies on site to avoid pollution.<br>• The installation of the stormwater system must take place as soon as possible after commencement of the construction activities, to attenuate stormwater from the construction as well as the operational phase.<br>• Earth, stone and rubble is to be properly disposed of so as not to obstruct natural water path ways over the site. (i.e. these materials must not be placed in stormwater channels, drainage lines or rivers).<br>• There should be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed.<br>• If a batching plant is necessary, run-off should be managed effectively to avoid contamination of other areas of the site. Runoff from the batch plant must not be allowed to get into the stormwater system or nearby steams, rivers or erosion channels or dongas. | ECO, Main Contractor | Weekly |

**Table 8: Air Quality**

| Phase | Mitigation | Responsibility | Frequency/Monitoring requirements |
|---|---|---|---|

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|---|---|---|---|
| **Construction** | **Dust control**<br>• Wheel washing and damping down of un-surfaced and unvegetated areas.<br>• Retention of vegetation where possible will reduce dust travel.<br>• Excavations and other clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas.<br>• Damping down of all exposed soil surfaces with water sprinklers when necessary to reduce dust.<br>• The Contractor shall be responsible for dust control on site to ensure no nuisance is caused to the Landowner or neighbouring Communities.<br>• A speed limit of 30km/h must not be exceeded on dirty roads (if any).<br>• Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor.<br>• Regular servicing of vehicles in order to limit gaseous emissions (to be done off-site).<br>• Regular servicing of on site toilets to avoid potential odours.<br>• Allocated cooking areas must be provided.<br>• The contractor must make alternative arrangements (other than fires) for cooking and / or heating requirements. LP gas cookers may be used provided that all safety regulations are followed.<br>**Rehabilitation**<br>• The contractor should commence rehabilitation of exposed soil surfaces as soon as practical after completion of earthworks.<br>**Fire prevention**<br>• The contractor must ensure that any grass left in a natural state during the construction of a powerline should be cut in order to prevent veld fires, especially during the dry months.<br>• No open fires shall be allowed on site under any circumstance. All cooking shall be done in demarcated areas that are safe and cannot cause runaway fires.<br>• The Contractor shall have operational fire-fighting equipment available on site at all times. The level of fire fighting equipment must be assessed and evaluated thorough a typical risk assessment process. It may be required to increase the level of protection, especially during the winter months. | ECO, Main Contractor | Daily |

**Table 9: Noise**

| Phase | Mitigation | Responsibility | Frequency/Monitoring requirements |
|---|---|---|---|
| **Construction** | • Noise levels should not exceed 40db and all works will be restricted to working hours**.**<br>• The construction phase must aim to adhere to the relevant noise regulations and limit noise to within standard working hours in order to reduce disturbance of residential areas in close proximity to the development.<br>• Construction site yards, workshops, and other noisy fixed facilities should be located well away from noise sensitive areas. Once the proposed final layouts are made available by the contractor(s), the sites must be evaluated in detail and specific measures designed into the system.<br>• Truck traffic should be routed away from noise sensitive areas, where possible.<br>• Noisy operations should be combined so that they occur where possible at the same time.<br>• Blasting operations (if required) are to be strictly controlled with regard to the size of explosive charge in order to minimise noise and air blast, and timings of explosions. The number of blasts per day should be limited, blasting should be undertaken at the same times each day and no blasting should be allowed at night.<br>• Construction activities are to be contained to reasonable hours during the day and early evening. Night-time activities near noise sensitive areas should not be allowed.<br>• With regard to unavoidable very noisy construction activities in the vicinity of noise sensitive areas, the contractor and ECO should liaise with local residents on how best to minimise impact, and the local population should be kept informed of the nature and duration of intended activities.<br>• As construction workers operate in a very noisy environment, it must be ensured that their working conditions comply with the requirements of the Occupational Health and Safety Act (Act No 85 of 1993). Where necessary ear protection gear should be worn.<br>• Noisy activities to take place during allocated construction hours only as per section 25 of the Noise Control Regulations of the Environment Conservation Act, 1989 (Act No. 73 of 1989).<br>• Noise from labourers must be controlled.<br>• Noise suppression measures must be applied to all construction equipment. Construction equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or | ECO, Main Contractor | Daily |

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| | equipment not be in good working order, the contractor may be instructed to remove the offending vehicle or machinery from site.<br>• The contractor must take measures to discourage labourers from loitering in the area and causing noise disturbance. Where possible labour shall be transported to and from the site by the contractor or his Sub-Contractors by the contractors own transport. | | |

**Table 10: Vegetation disturbance**

| Phase | Mitigation | Responsibility | Frequency/Monitoring requirements |
|---|---|---|---|
| **Construction** | • Power line: The spans that cross drainage lines should be marked with Bird Flight Diverters on the earth wire of the line, five metres apart, alternating black and white<br>• Ecological study has revealed that there are couples of maraula trees at the site, these trees species are protected in terms of the National Forest Act of 1998 (Act 84 of 1998), so these trees must be protected at all cost.<br>• Trees: The removal of large trees should be avoided if at all possible.<br>• Poles: The poles should be fitted with bird perches on top of the poles to draw birds, particularly vultures, away from the potentially risky insulators<br>• During all phases of the project; workers must be limited to areas under construction and access to neighbouring undeveloped areas adjacent to the sub-station and power line must be strictly regulated, preventing disturbances to the surrounding environment.<br>• Weeds and alien invasive vegetation should be removed and prevented from spreading into newly disturbed areas or areas recently cleared of vegetation.<br>• Exotic tree species should be replaced with suitable indigenous tree or shrub species.<br>• Materials should not be delivered to the site prematurely which could result in additional areas being cleared or affected.<br>• No vegetation to be used for firewood.<br>• All alien invasive species including species surrounding the site should be removed to prevent further invasion and replaced with indigenous tree, grass and plant species.<br>• Horticultural activities should be severely restricted and only allowed around certain predetermined areas.<br>• Gardens or landscaped areas around the proposed development (extremely limited), should be planted with indigenous | ECO, Ecologist | Weekly |

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| | (preferably using endemic or local species from the area) grasses, forbs, shrubs and trees, which are water wise and require minimal horticultural practices.<br><br>**Rehabilitation**<br><br>• Re-vegetation and rehabilitation Manual should be prepared for use of contractors. Where herbicides are used to clear vegetation, specimen specific chemicals should be applied to individual plants only. General spraying should be prohibited. All alien vegetation should be eradicated over five year period. Invasive species should be given the highest priority.<br><br>• Where the removal of alien species may leave soil exposed, alternative indigenous species should be established before eradication takes place. Individual property owners along the powerline should be encouraged to plant indigenous non-invasive plants.<br><br>• All damaged areas shall be rehabilitated upon completion of the contract in accordance with ECO satisfaction. Slopes in excess of 2% must be contoured and slopes in excess of 12% must be terraced. Extra seed shall be sown on disturbed areas as directed by the ECO (see below for specifications). Other methods of rehabilitating disturbed sites may also be used at the discretion of the Project Manager to comply with the conditions of the EMP, e.g. stone pitching, logging, etc. Contour banks shall be spaced according to the slopes. The type of soil shall also be taken into consideration.<br><br>• A mixture of vegetation seed can be used, provided the mixture is carefully selected to ensure the following:<br><br>• Annual and perennial species are chosen.<br><br>• Pioneer species are included.<br><br>• All the species shall not be edible.<br><br>• Species chosen will grow in the area under natural conditions.<br><br>• Root systems must have a binding effect on the soil.<br><br>• The final product should not cause an ecological imbalance in the area.<br><br>• All natural areas impacted during construction must be rehabilitated with locally indigenous grasses typical of the representative botanical unit.<br><br>• Fragmentation must be kept to a minimum.<br><br>• Rehabilitation must take place as soon as construction is complete to avoid the edge effect, the infiltration of alien species and soil erosion within the servitude.<br><br>• Rehabilitation process must make use of species indigenous to the area. Seeds from surrounding seed banks can be used for | | |

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| | re seeding.<br>**Demarcation of construction area**<br>• The construction area must be well demarcated and no construction activities must be allowed outside of this demarcated footprint.<br>• Areas which are identified by the ECO as being ecologically sensitive and which are adjacent to any construction work are to be suitably demarcated to prevent damage by labour and equipment.<br>• Only vegetation within the construction area must be removed.<br>• Vegetation removal must be phased in order to reduce impact of construction.<br>• The construction site office and laydown areas must be clearly demarcated and no encroachment must occur beyond demarcated areas.<br>• Strict and regular auditing of the servitude to ensure containment of the construction activities.<br>• Where the route passes intact vegetation (but does not impact onit), a buffer zone should be established to ensure that construction activities do not extend into these areas.<br>• Construction areas must be well demarcated and these areas strictly adhered to.<br>• Soils must be kept free of petrochemical solutions that may be kept on site during construction. Spillage can result in a loss of soil functionality thus limiting the re-establishment of flora.<br>**Utilisation of resources**<br>• Gathering of firewood or any other natural material onsite or in areas adjacent to the site is prohibited.<br>**Exotic vegetation**<br>• 27. All exotic vegetation must be removed from site.<br>• 28. Alien vegetation on the site will need to be removed.<br>• 29. The contractor should be responsible for implementing a programme of weed control (particularly in areas where soil has been disturbed); and grassing of any remaining stockpiles to prevent weed invasion.<br>• 30. The spread of exotic species occurring throughout the site should be controlled.<br>**Construction schedule**<br>• Where possible, construction should take place during winter i.e. the dormant stage to minimise impacts on vegetation | | |

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| | during the growing season.<br>**Removal of Vegetation**<br>• All vegetation within the footprint of the construction trench must be removed immediately prior to the onset of excavation<br>**Sensitive area mitigation measures**<br>• Intensive environmental compliance monitoring must be conducted by an independent party during this construction period | | |

**Table 11: Fauna**

| Phase | Mitigation | Responsibility | Frequency/Monitoring requirements |
|---|---|---|---|
| **Construction** | • The contractor must ensure that no faunal species are disturbed, trapped, hunted or killed during the construction phase.<br>• Containment of construction servitudes through identified sensitive areas.<br>• The steel monopoles that should be fitted with a bird perch at the top of the pole. This will provide additional safe perching space to birds and will draw them away from the dangerous areas on the insulators.<br>• The earth wire of the line should be fitted with Bird Flight Diverters.<br>• As a precautionary mitigation measure it is recommended that Eskom and construction contractor as well as an independent environmental control officer should be made aware of the possible presence of certain threatened animal species prior to the commencement of construction activities. In the event that any of the above-mentioned species are discovered relevant conservation authorities should be informed and activities surrounding the site suspended until further investigations have been conducted.<br>• 6. All necessary mitigation measures must be implemented to minimise impacts on the environment. | ECO | Weekly |

**Table 12: Waste Management**

| Phase | Mitigation | Responsibility | Frequency/Monitoring requirements |
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| **Construction** | **Construction rubble**<br>• Construction rubble shall be disposed of in pre – agreed, demarcated spoil dumps that have been approved by the relevant Municipality.<br>**Litter management**<br>• Refuse bins must be placed at strategic positions to ensure that litter does not accumulate within the construction site.<br>• Waste disposal will need to take place in terms of Section 20 if the Environmental Conservation Act (Act No. 73 of 1989).<br>• Skip waste containers should be maintained on site. These should be kept covered and arrangements made for them to be collected regularly form the site by the local council.<br>• All waste must be removed from the site and transported to a landfill site as approved by the relevant Municipality.<br>• Waybills providing disposal at each site shall be provided to the ECO's inspection.<br>**Hazardous waste**<br>• All waste hazardous materials must be carefully stored as advised by the ECO, and then disposed of off site at a licensed landfill site.<br>• Contaminants to be stored safely to avoid spillage<br>• Machinery must be properly maintained to keep oil leaks in check.<br>• All solid waste generated during the construction process must be placed in bulk waste collection area<br>• In the Contractors camp. The bund walls must be high enough to contain 110% of the total volume of the stored hazardous material.<br>• The waste will be cleared regularly by a recognised waste Contractor<br>• Litter collection bins must be provided within the Contractors camp at convenient intervals and must be be regularly cleared<br>• Separation of waste and recycling of paper, glass etc. must be encouraged<br>**Sanitation**<br>• The Contractor shall provide mobile chemical toilets on the site.<br>• Staff shall be sensitised to the fact that they should use these facilities at all times. No indiscriminate sanitary activities on site shall be allowed.<br>• Ablution facilities shall be within 100m from workplaces but not closer than 50m from any natural water bodies or boreholes. There should be enough toilets available to accommodate the workforce. Male and females must be accommodated separately where possible. | ECO | Weekly |
| | **Remedial actions**<br>• Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated on-site.<br>18. Excavation of contaminated soil must involve careful removal of soil using appropriate tools/machinery to storage containers until treated or | | |

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| Construction | **Worker safety**<br>• Implementation of safety measures, work procedures and first aid must be implemented on site.<br>• A health and safety plan in terms of the Occupational Health and Safety Act (Act No. 85 of 1993) must be drawn up to ensure worker safety.<br>• Workers should be thoroughly trained in using potentially dangerous equipment.<br>• Contractors must ensure that all equipment is maintained in a safe operating condition.<br>• A safety officer must be appointed.<br>• A record of health and safety incidents must be kept on site.<br>• Any health and safety incidents must be reported to the project manager immediately.<br>• First aid facilities must be available on site at all times.<br>• Workers have the right to refuse work in unsafe conditions.<br>• The Contractor shall take all the necessary precautions against the spreading of disease such as measles, etc. especially under livestock.<br>• A record shall be kept of drugs administered or precautions taken and the time and dates when this was done. This can then be used as evidence in court should any claims be instituted against Eskom or Contractor.<br>• The contractor must ensure that all construction workers are well educated about HIV/ AIDS and the risks surrounding this disease.<br>• Material stockpiles or stacks, such as, pipes must be stable and well secured to avoid collapse and possible injury to site workers.<br>**Worker facilities**<br>• Eating areas should be regularly serviced and cleaned to ensure the highest possible standards of hygiene and cleanliness<br>• Fires are not to be allowed.<br>**Protective gear**<br>• Personal Protective Equipment (PPE) must be made available to all construction staff and must be compulsory. Hard hats and safety shoes must be worn at all times and other PPE worn were necessary i.e. dust masks, ear plugs etc.<br>• No person is to enter the site without the necessary PPE. | ECO | Weekly |

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| | **Site safety**<br>• The construction camp must remain fenced for the entire construction period.<br>• Potentially hazardous areas such as trenches are to be demarcated and clearly marked<br>• Adequate warning signs of hazardous working areas.<br>• Uncovered manholes and excavations must be clearly demarcated.<br>• Emergency numbers for local police and fire department etc must be placed in a prominent area.<br>• Fire fighting equipment must be placed in prominent positions across the site where it is easily accessible. This includes fire extinguishers, a fire blanket as well as a water tank.<br>• Suitable conspicuous warning signs in English and all other applicable languages must be placed at all entrances to the site.<br>• All speed limits must be adhered to.<br>**Hazardous Material Storage**<br>• Staff that will be handling hazardous materials must be trained to do so.<br>• Any hazardous materials (apart from fuel) must be stored within a lockable store with a sealed floor.<br>• The bund walls for the transformer oil containers must be in place before the installation of these containers.<br>• The provisions of the Hazardous Chemical Substances Regulations promulgated in terms of the Occupational Health and Safety Act 85of 1993 and the SABS Code of Practise must be adhered to. This applies to solvents and other chemicals possibly used in the construction time.<br>• The immediate response must be to contain the spill.<br>• The source of the spill must be identified, controlled, treated or removed.<br>**Fire management**<br>• Fire fighting equipment should be present on site at all times as per OHSA.<br>• All construction staff must be trained in fire hazard control and fire fighting techniques.<br>• All flammable substances must be stored in dry areas which do not pose an ignition risk to the said substances.<br>• No open fires will be allowed on site.<br>• Smoking may only be conducted in demarcated areas.<br>**Procedure in the event of a petrochemical spill**<br>• The individual responsible for or who discovers the petrochemicalspill must report the incident to the Project Manager, ECO or Contractor.<br>• The problem must be assessed and the necessary actions required will be undertaken. | ECO | Weekly |
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**Table 13: Security**

| Phase | Mitigation | Responsibility | Frequency/Monitoring requirements |
|---|---|---|---|
| Construction | • Access to the construction site should be strictly controlled by a security company.<br>• 24 hour security on-site.<br>• Unsocial activities such as consumption or illegal selling of alcohol, drug utilisation or selling on site should be prohibited. Any persons found to be engaged in such activities shall receive disciplinary or criminal action taken against them.<br>• No person shall enter the site unless authorised to do so by the contractor, project manager and ECO<br>• If any fencing interferes with the construction process, such fencing shall be deviated until construction is completed. The deviation of fences shall be negotiated and agreed with the landowner in writing.<br>• Construction staff is to make use of the facilities provided for them, as opposed to ad-hoc alternatives (e.g. fires for cooking, the use of surrounding bush as a toilet facility are forbidden).<br>• Trespassing on private / commercial properties adjoining the site is forbidden.<br>• Driving under the influence of alcohol is prohibited.<br>• All employees must undergo the necessary safety training and wear the necessary protective clothing.<br>• Secure the site in order to reduce the opportunity for criminal activity in the locality of the construction site | Main Contractor, ECO | Weekly |

**Table 14: Social Environment**

| Phase | Mitigation | Responsibility | Frequency/Monitoring requirements |
|---|---|---|---|
| Construction | • All contact with the affected parties shall be courteous at all times.<br>• The rights of the affected parties shall be respected at all times.<br>• A complaints register should be kept on site. Details of complaints should be incorporated into the audits as part of the monitoring process. This register is to be tabled during monthly site meetings<br>• Where possible unskilled job opportunities should be afforded to local community members.<br>• Equal opportunities for employment should be created to ensure that the local female population also have access to these opportunities. Females should be encouraged to apply for positions.<br>• Payment should comply with applicable Labour Law legislation in terms of minimum wages. | Main Contractor, ECO | Weekly |

**Table 15: Cultural and Heritage Artefacts**

| Phase | Mitigation | Responsibility | Frequency/Monitoring requirements |
|---|---|---|---|
| Construction | • Heritage report conducted at the site indicated that is possible that phase 1 HIA study may have missed heritage resources as heritage sites may occur in clumps of vegetation while others may lie below the surface of the earth and may only be exposed once development commences. However, it concluded that there is no reason from a heritage point of view why the Eskom should not continue.<br>• Any finds must be reported to the nearest National Monuments office to comply with the National Heritage Resources Act (Act No 25 of 1999)<br>• Local museums as well as the South African Heritage Resource Agency (SAHRA) should be informed if any artefacts are uncovered in the affected area.<br>• The contractor must ensure that his workforce is aware of the necessity of reporting any possible historical or archaeological find to the ECO so that appropriate action can be taken.<br>• Any discovered artefacts shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits shall be obtained from the South African Heritage Resources | Main Contractor, ECO | Weekly |

## 6. ENVIRONMENTAL MANAGEMENT PROGRAMME: OPERATIONAL PHASE

**Table 16: Power lines Operation and Maintenance**

| Phase | Mitigation | Responsibility | Frequency/Monitoring requirements |
|---|---|---|---|
| Operational | **Maintenance**<br>1. All applicable standards, legislation, policies and procedures must be adhered to during operation.<br>2. Regular inspection of the power line must take place to monitor their status. | Eskom, Project Manager | Monthly |

**Table 17: Biodiversity (fauna and flora)**

| Phase | Mitigation | Responsibility | Frequency/Monitoring requirements |
|---|---|---|---|
| Operational | **Vegetation**<br>1. Indigenous vegetation must be maintained on the servitude on an annual basis and all exotics removed as they appear and disposed off appropriately.<br>**fauna**<br>**2.** Very little activity of wild animals was observed, no any flora species must be harmed by construction staff during construction | Eskom | Annually |

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| **Decommissioning phase** | **Removal of equipment**<br>• All structures comprising the construction camp are to be removed from site.<br>• The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc, and these shall be cleaned up.<br>• All hardened surfaces within the construction camp area should be ripped, all imported materials removed, and the area shall be top soiled and regressed.<br>• Construction materials must be removed once construction has ended; e.g.crushed stone may not be left or randomly strewn around the site.<br>**Temporary services**<br>• The Contractor must arrange the cancellation of all temporary services.<br>• A copy of all way bridge certificates from waste disposed are to be presented to the ECO.<br>• Temporary roads must be closed and access across these, blocked.<br>• All areas where temporary services were installed are to be rehabilitated to the satisfaction of the ECO.<br>**Associated infrastructure**<br>• Surfaces are to be checked for waste products from activities such as concreting and cleared in a manner approved by the ECO.<br>• All surfaces hardened due to construction activities are to be ripped and imported material thereon removed.<br>• All rubble is to be removed from the site to an approved disposal site as approved by the ECO. Burying of rubble on site is prohibited.<br>• The site is to be cleared of all litter.<br>• The Contractor is to check that all watercourses are free from building rubble, spoil materials and waste materials.<br>• Fences, barriers and demarcations associated with the construction phase are to be removed from the site.<br>• All residual stockpiles must be removed to spoil or spread on site as directed by the ECO.<br>• All leftover building materials must be returned to the depot or removed from the site.<br>• The Contractor must repair any damage that the construction works has caused to neighbouring properties, specifically, but not limited to, damage caused by poor storm water management. | Main Contractor, Eskom, ECO | Weekly |

## 7. CONCLUSION

Provided that mitigation measures are implemented as per this EMPr, the project will result in limited negative environmental impacts. This project can also be considered as environmentally acceptable. Furthermore, this EMPr 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 20) is designed to assist with the site inspections, which will take place continuously during the construction and operational phase.

## 8. RECOMMENDATIONS

This Environmental Management Programme (EMPr) 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 EMPr. Parties responsible for transgression of this EMPr shall be held responsible for any rehabilitation that may need to be undertaken. Parties responsible for environmental degradation through irresponsible behavior or negligence should receive penalties.

**Table 18 : Environmental and Incident Log**

| ENVIRONMENTAL AND INCIDENT LOG | | | | |
|---|---|---|---|---|
| **DATE** | **SITE CONDITONS** | **COMMENTS** | **CORRECTIVE ACTION TAKEN** | **SIGNATURE** |
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**Table 19: Complaints Record Sheet**

| **COMPLAINTS RECORD SHEET** | |
|---|---|
| **DATE:** | **FILE REFERENCE NUMBER:** |
| **COMPLAINT RAISED BY:** | |
| **CAPACITY OF COMPLAINANT:** | |
| **COMPLAINT RECORDED BY:** | |
| **COMPLAINT:** | |
| **COMPLAINT RAISED BY:** | |
| • | |
| • | |
| • | |
| • | |
| **ECO'S PROPOSED REMEDIAL ACTION** | |
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| • | |
| • | |
| • | |
| **ECO**<br>Signature: …….<br>Date:…….. | **SITE MANAGER**<br>Signature: …….<br>Date:…….. |