

**Eskom Holdings (SOC) Limited**



**Environmental Management Plan for the  
Proposed Retrofitting of the Existing  
Electrostatic Precipitators with Fabric  
Filter Bags at Grootvlei Power Station  
Units 2, 3 and 4, Mpumalanga Province**



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**Eskom Holdings (SOC) Limited****Environmental Management Plan for the Proposed Retrofitting of the Existing Electrostatic Precipitators with Fabric Filter Bags at Grootvlei Power Station Units 2, 3 and 4, Mpumalanga Province****TABLE OF CONTENTS**

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**CONTACT DETAILS OF RESPONSIBLE PERSONS**

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## **GLOSSARY OF TERMS AND ABBREVIATIONS**

### CONTRACTOR:

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

### EMERGENCY:

An undesired event that may result in a significant environmental impact and requires the notification of the relevant statutory body such as a local authority.

### EMISSIONS:

The release or discharge of a substance into the environment, which generally refers to the release of gases or particulates into the air.

### EMP:

Environmental Management Programme/Plan. A detailed plan of action prepared to ensure that recommendations for preventing the negative environmental impacts and where possible improving the environment are implemented during the life-cycle of a project.

### 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 well-being.

### ENVIRONMENTAL CONTROL OFFICER:

A suitably qualified individual who would, on behalf of Eskom, on a daily basis monitor the project compliance with conditions of the Environmental Authorisation (EA), environmental legislation and recommendations of this Environmental Management Programme.

### ENVIRONMENTAL IMPACT:

A change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services.

### ESKOM'S PROJECT MANAGER:

The Eskom appointed person, appointed to act as the manager of the project on behalf of Eskom.

INCIDENT:

An undesired event which may result in a significant environmental impact but can be managed through internal response.

PARTICULATE MATTER:

The collective name for fine solid or liquid particles added to the atmosphere by processes at the earth's surface and includes dust, smoke, soot, pollen and soil particles. Particulate matter is classified as a criteria pollutant, thus national air quality standards have been developed in order to protect the public from exposure to the inhalable fractions. PM can be principally characterised as discrete particles spanning several orders of magnitude in size, with inhalable particles falling into the following general size fractions:

- PM10 (generally defined as all particles equal to and less than 10 microns in aerodynamic diameter; particles larger than this are not generally deposited in the lung);
- PM10-2.5, also known as coarse fraction particles (generally defined as those particles with an aerodynamic diameter greater than 2.5 microns, but equal to or less than a nominal 10 microns); and
- Ultra fine particles generally defined as those less than 0.1 microns.

SITE MANAGER:

The Eskom appointed person, appointed to act as Site Manager by Eskom, and is responsible for managing the construction process on site.

# **1 INTRODUCTION**

## **1.1 Overview of the Proposed Project**

On the 31st of March 2010, Notice 248 was published, by the Department of Environmental Affairs (DEA), in terms of the National Environmental Management: Air Quality Act (Act 39 of 2004), providing new Minimum Emission Standards. The new standards require that all existing power stations conform to a standard of 100mg/Nm<sup>3</sup> (Nm<sup>3</sup> = Normalised cubic meter, 101,325kPa, 0°C, normalised to 10% reference O<sub>2</sub>, on a dry basis) by 2015. New power stations are required to conform to 50mg/Nm<sup>3</sup> by 2020.

The purpose of this project is to retrofit the existing particulate emission abatement technology with new technology that will allow the Grootvlei Power Station to consistently meet the above mentioned particulate emission license limit for existing stations. The project involves the retrofitting of the existing Electrostatic Precipitators (ESPs) in Units 2, 3 and 4 with Fabric Filter Plants (FFPs) utilising a pulse jet cleaning technology that will fit into the existing ESP casings (with an increased height of 1.1 m).

## **1.2 Applicable Documentation**

The following environmental documentation is applicable for the project, and will be read in conjunction with this EMP:

- Basic Assessment Report for the proposed retrofitting project at Grootvlei Power Station, Mpumalanga Province.
- Environmental Authorisation issued by the National Department of Environmental Affairs (DEA) (still to be issued).
- All relevant Operational Control documents forming part of the Eskom's Grootvlei Power Station Environmental Management System.

## **1.3 Structure of the Environmental Management Plan**

The EMP provides mitigation and management measures for the following phases of the project:

- *Construction Phase*  
This section of the EMP provides management principles for the construction phase of the project. Environmental actions, procedures and responsibilities as required within the construction phase are specified. These specifications will form part of the contract documentation and, therefore, the Contractor will be required to comply with the specifications to the satisfaction of the Project Manager and Environmental Control Officer, in terms of the construction contract.
- *Operation and Maintenance Phase*  
This section of the EMP provides management principles for the operation and maintenance phase of the project. Environmental actions, procedures and



responsibilities as required from Eskom within the operation and maintenance phase are specified.

- *Decommissioning Phase*

This section includes principles for the decommissioning phase of the project. This section of the EMP will be required to be revisited and updated at the time of decommissioning.

All relevant environmental legislation pertaining to the project is listed in **Section 3**. The Contractor and the client are required to comply with this legislation for all phases of the project. This list is intended to serve as a guideline only for the Contractor and is not exhaustive.

#### **1.4 Objectives of the EMP**

The EMP has the following objectives:

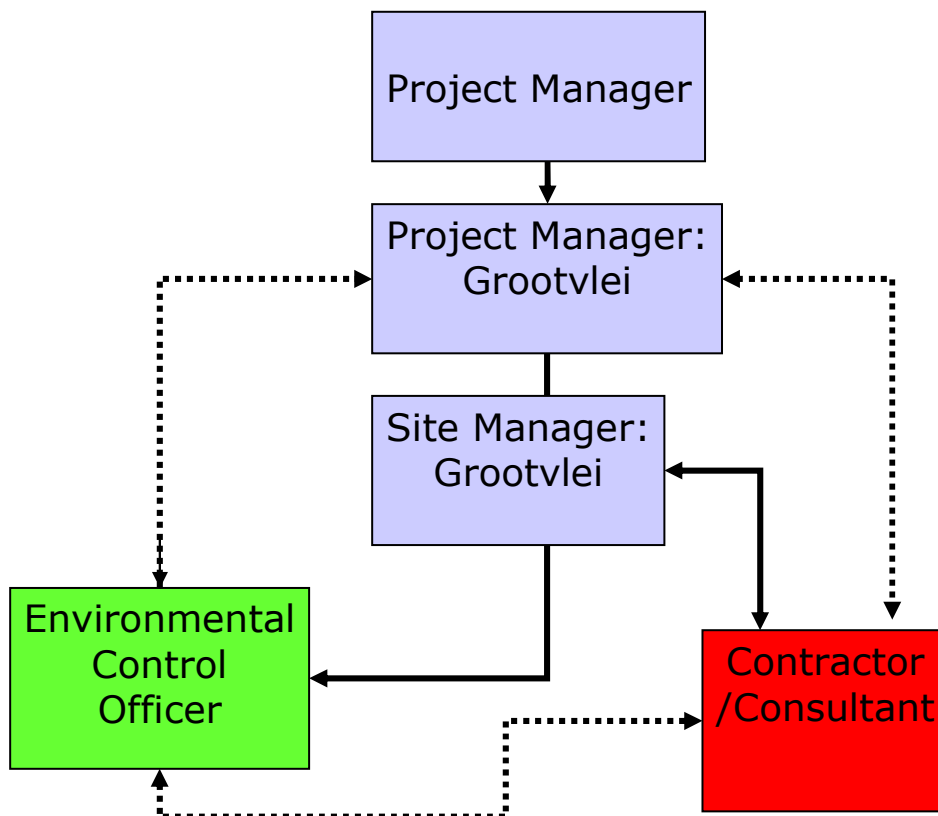
- To outline functions and responsibilities of responsible persons.
- To state standards and guidelines, which are required to be achieved in terms of environmental legislation.
- To outline mitigation measures and environmental specifications which are required to be implemented for all phases of the project in order to minimise the extent of environmental impacts, and to manage environmental impacts associated with the Sishen Infrastructure Programme.
- To prevent long-term or permanent environmental degradation.

## 2 MANAGEMENT PROCEDURES

### 2.1 Organisational Structure and Responsibility

#### 2.1.1 Functions and Responsibilities

Formal responsibilities are necessary to ensure that key procedures are executed. Specific responsibilities of the Project Manager, Site Manager and Environmental Control Officer for the construction phase of this project are as detailed below.



#### The Project Manager will:

- Ensure that Eskom and the Contractor are aware of all specifications, legal constraints and Eskom standards and procedures pertaining to the project specifically with regards to the environment.
- Ensure that all stipulations within the EMP/EA are communicated and adhered to by Eskom and its Contractor(s).
- Monitor the implementation of the EMP/EA throughout the project by means of site inspections and meetings. This will be documented as part of the site meeting minutes.
- Be fully conversant with the Basic Assessment for the project, the conditions of the Environmental Authorisation (EA), and all relevant environmental legislation.

**The Site Manager will:**

- Be fully conversant with the Basic Assessment, the EA and the EMP.
- Approve method statements.
- Provide support to the ECO
- Be fully conversant with all relevant environmental legislation and Eskom environmental policies and procedures, and ensure compliance with these.
- Have overall responsibility for the implementation of the EMP/EA.
- Ensure that audits are conducted to ensure compliance to the EMP/EA.
- Liaise with the Project Manager or his delegate, the Environmental Control Officer and others on matters concerning the environment.
- Prevent actions that will harm or may cause harm to the environment, and take steps to prevent pollution on the site.
- Confine activities to the demarcated construction site.

**The Environmental Control Officer:**

- A suitably qualified Environmental Control Officer (ECO) who would, on a daily basis monitor the project compliance with conditions of the EA, environmental legislation and recommendations of the EMP/EA.
- The costs of the ECO shall be borne by Eskom.

The Environmental Control Officer shall:

- Be fully conversant with the BAR, EA and EMP.
- Be fully conversant with all relevant environmental legislation and Eskom environmental policies and procedures, and ensure compliance with them.
- Ensure that periodic environmental performance audits are undertaken on the project implementation.
- Approve method statements
- Maintain the following on site:
  - A daily site incident register
  - A non-conformance register (NCR)
  - A public complaints register
  - A register of audits
- Remain employed until the completion of the construction phase.
- Report to project manager.

In addition, the Environmental Control Officer shall:

- Convey the contents of this document to the relevant site staff and discuss the contents in detail with the Project Manager and Contractor.
- Undertake regular and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the EMP/EA.
- Take appropriate action if the specifications contained in the EMP/EA are not followed.

- Monitor and verify that environmental impacts are kept to a minimum, as far as possible.
- Ensure that activities on site comply with all relevant environmental legislation.

### **Contractors and Service Providers:**

All contractors (including subcontractors and staff) and service providers are ultimately responsible for:

- complying with the Grootvlei Power Station's environmental management specifications;
- Be conversant with all EIA documentation, and ensure compliance thereto
- adhering to any environmental instructions issued by the Site Manager/Project Manager on the advice of the ECO;

## **2.2 Awareness and Competence**

It is important to ensure that all relevant personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and ongoing minimisation of environmental harm.

To achieve effective environmental management, it is important that employees, Contractors and Subcontractors are aware of the responsibilities in terms of the relevant environmental legislation and the contents of this EMP and the relevant Eskom procedures. The ECO shall be responsible for the training sessions. Environmental training must include the following:

- Employees must have a basic understanding of the key environmental features of the surrounding environment;
- Employees will be thoroughly familiar with the requirements of the EMP/EA and the environmental specifications as they apply to the Fabric Filter Plants (FFPs).
- Employees must undergo training for the operation and maintenance activities associated with the new FFPs and have a basic knowledge of the potential environmental impacts that could occur and how they can be minimised and mitigated.
- Records must be kept of those that have completed the relevant training.

## **2.3 Monitoring**

The existing monitoring programme at the Grootvlei Power Station will ensure conformance with the EMP/EA through the contract/work instruction specifications.

The Environmental Officer at the power station will ensure compliance with the EMP/EA during operation, and will manage the monitoring activities. The Environmental Control Officer, will ensure compliance with the EMP/EA during construction, and will report to the Site Manager should any non-compliance be evident or corrective action necessary. Only

in severe cases of non-compliance, or repeated offences, will the Environmental Control Officer be required to report to the Site Manager.

All instruments and devices used for the measurement or monitoring of any aspect of this EMP/EA must be calibrated and appropriately operated and maintained.

## **2.4 Non-Conformance and Corrective Action**

The auditing of the construction or operation of the new FFPs and their associated infrastructure may identify non-conformances of the EMP/EA. Non-conformances may also be identified through incidents, emergencies or complaints. In order to correct these non-conformances, the source must be determined and corrective actions must be identified and implemented.

### ***2.4.1 Compliance with the Environmental Management Plan and/or Environmental Authorisation conditions***

- The EMP/EA will be available on-site at all times.
- All persons employed by the Contractor or his sub-contractors will abide by the requirements of the EMP/EA.
- Any members of the construction workforce found to be in breach of any of the specifications contained within the EMP/EA may be ordered by the Site Manager to leave the site. The Contractor will not direct a person to undertake any activity which would place them in contravention of the specifications contained within the EMP/EA.
- Should the Contractor be in breach of any of the specifications contained in the EMP/EA, the Site Manager will, in writing, instruct the Contractor responsible for the incident of non-compliance regarding corrective and/or remedial action required, specify a timeframe for implementation of these actions, implement a penalty and/or indicate that work will be suspended should non-compliance continue.
- Should non-compliance continue, further written notification will be forwarded to the Contractor responsible for the incident of non-compliance outlining the required corrective and/or remedial action, the timeframe for implementation, penalties and/or work will be suspended as specified previously.
- Departmental officials will be given access to the property referred to in the EA for the purpose of assessing and/or monitoring compliance with the conditions contained in the EA, at all reasonable times.

## **2.5 Documentation and Reporting**

The following documentation must be kept on site in order to record compliance with the EMP/EA:

- Record of Complaints
- Record of Emergencies and Incidents.

The Contractor will report on the following:

- Environmental incidents involving Contractor/power station employees and/or the public.
- environmental complaints and correspondence received from the public
- incidents that cause harm or may cause harm to the environment.

The above records will form an integral part of the ECO's Records. These records will be kept with the EMP/EA, and will be made available for scrutiny if so requested by the Site Manager or his delegate and the Environmental Control Officer.

The Contractor will ensure that the following information is recorded for all environmental complaints/incidents/emergencies:

- Nature of complaint/incident/emergency.
- Causes of complaint/incident/ emergency.
- Party/parties responsible for causing complaint/incident/ emergency.
- Immediate actions undertaken to stop/reduce/contain the causes of the complaint/incident/ emergency.
- Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint/incident/ emergency.
- Timeframes and the parties responsible for the implementation of the corrective or remedial actions.
- Procedures to be undertaken and/or penalties to be applied if corrective or remedial actions are not implemented.
- Copies of all correspondence received regarding complaints/incidents/emergency.

## **2.6 Public Communication**

A signboard must be erected at the entrance to the power station, informing the public of the construction activities taking place. The signboard must include the following information:

- The name of the contractor
- The name and contact details of the site representative to be contacted in the event of emergencies or complaint registration.

### **3 ENVIRONMENTAL GUIDELINES, STANDARDS AND PERMITS**

#### **3.1 Legal Summary**

The following is a summary of the applicable environmental legislation for the New Fabric Filter Plants at the Grootvlei Power Station.

<b>APPLICABLE LEGISLATION ALREADY IN EFFECT AT DATE OF THIS EMP</b>
• Constitution of South Africa (Act No. 108 Of 1996)
• Environment Conservation Act (Act No. 73 Of 1989)
• National Environmental Management Act (Act No. 107 Of 1998)
• National Environmental Management: Air Quality Act (Act No. 39 of 2004)
• National Environmental Management: Waste Act (Act No. 59 of 2008)
• Occupational Health and Safety Act (Act No. 85 Of 1993)
• National Environmental Management Amendment Act No. 8 of 2004

#### **3.2 Environmental Guidelines and Standards**

All applicable environmental standards contained within the environmental legislation will be adhered to. At the time of compiling this EMP, the following environmental guidelines and standards were identified as being applicable.

##### **3.2.1 Air Quality Standards**

Currently air pollution in South Africa is regulated under the National Environmental Management: Air Quality Act 39 of 2004, which replaced the Atmospheric Pollution Prevention Act 45 of 1965 (APPA). The new Act was signed by the President and gazetted in February 2005 and sections of the act have come into force subsequently.

##### **3.2.2 Waste Disposal**

All waste (general and hazardous) generated during the construction and operation phases may only be disposed of at appropriately licensed waste disposal sites (. Towards this end, the station's waste management procedures must be complied with.

#### **3.3 Environmental Permitting Requirements**

Environmental permits, which will be required to be obtained for construction and operation, are discussed briefly below. These will be required to be obtained before construction commences.

##### **3.3.1 Air Quality Licence**

Although Eskom has an existing Air Quality Licence, the change in air quality abatement technology will result in a change in the actual emissions quality which in turn results in the need for Eskom to request a change of this Air Quality Licence.

## **4 CONSTRUCTION**

### **4.1 Contractor Selection and Performance**

- Eskom must ensure that this EMP/EA forms part of any contractual agreements with sub-contractors for the execution of the proposed project
- The contractor must monitor the performance of the construction team from time to time to ensure compliance with the requirements of this EMP/EA

### **4.2 Legal and Other Requirements**

- Eskom and the Contractor must comply with the relevant provisions of the applicable environmental legislation and associated regulations promulgated in terms of these laws.

### **4.3 Social Interaction**

- The Grootvlei Power Station will deal with community complaints according to their communications procedure.
- Contractors must prevent and prohibit their employees from entering neighbouring land and homes.
- All construction activities must take place within the demarcated footprint.

### **4.4 Labour**

- Noisy activities must be undertaken during normal working hours (i.e. 6am to 6pm) as far as possible.
- Night-time activities should be limited as far as possible, maintained to "non-noisy" activities, and construction activities must be contained.

### **4.5 Employment – Local Preference**

- As far as possible, Eskom should encourage its contractors to give employment preference to those living in the surrounding areas in accordance with Eskom's commercial processes.

### **4.6 Safety and Security**

All provisions of the Occupational Health and Safety Act, 85 of 1993, and any other applicable legislation, including the relevant procedures in place at the Grootvlei Power station, must be adhered to by Eskom and its contractors.

### **4.7 Emergency Response**

Contractors must comply with the Eskom Emergency Preparedness and Response Procedure.



## 4.8 Fire Control

Element	Management Plan
<b>Sources</b>	Open fires / flames on site
<b>Controls</b>	<ul style="list-style-type: none"> <li>All construction personnel will receive training on fire hazards and techniques to extinguish any fire that may be initiated on the site.</li> <li>The equipment required to extinguish any fires that may be initiated by construction activities must be installed on the site.</li> <li>Flammable materials will be stored under conditions that will limit the potential for ignition and the spread of fires.</li> <li>The Contractor will supply fire-fighting equipment in proportion to the fire risk presented by the type of construction and other on-site activities and materials used on site. This equipment will be kept in good operating order.</li> <li>No fires must be allowed the construction site.</li> <li>Any welding or other sources of heating of materials must be done in a controlled environment, wherever possible and under appropriate supervision, in such a manner as to minimise the risk of fires and/or injury to staff.</li> <li>The use of open fires for cooking of food, is prohibited.</li> <li>Restrict smoking activities to demarcated smoking areas.</li> </ul>
<b>Corrective Action</b>	<ul style="list-style-type: none"> <li>Report any fires which occur to the Fire department immediately</li> </ul>

## 4.9 Site Establishment and Management

### 4.9.1 Construction Camp and Construction Staff

Prior to the establishment of the construction camp, the Contractor will produce a layout plan showing the positions of all buildings, vehicle wash areas, fuel and cement storage areas and other infrastructure for approval of the Site Manager, for approval.

Construction staff must be adequately educated by the Environmental Control Officer or the Site Manager as to the provisions included in the EMP/EA and general environmentally friendly practice.

### 4.9.2 Sanitation

Element	Management Plan
<b>Controls</b>	<ul style="list-style-type: none"> <li>Suitable toilets will be provided for the staff at all points at which workmen are carrying out duties under the contract</li> <li>Toilets must be clean and functional throughout the construction period.</li> <li>Station ablution facilities can be utilised</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>The Contractor will monitor that toilet facilities are used by personnel and that use of non-designated areas is actively discouraged.</li> </ul>

#### 4.9.3 Site Management

Element	Management Plan
<b>Controls</b>	<ul style="list-style-type: none"> <li>The Contractor must take responsibility for the site to conform to all contractual aspects and environmental standards applicable. This includes aspects related to stormwater management and waste management.</li> <li>The Contractor must provide adequate refuse bins that must be cleaned/emptied and the waste removed from site on a regular basis.</li> <li>The construction camp must be kept neat and tidy at all times.</li> </ul>

#### 4.9.4 Site Access

Element	Management Plan
<b>Controls</b>	<ul style="list-style-type: none"> <li>Access in and out of the site must be allowed only at identified access gates to minimise impacts during construction.</li> <li>Construction activities must be limited to areas which are deemed to be safe, and deemed as the minimum area needed for the construction activity. All areas that are identified by the Site Manager as being unsafe will be indicated as such with warning signs in all relevant languages.</li> </ul>

#### 4.9.5 Site Clearing (Workshop area)

Element	Management Plan
<b>Controls</b>	<ul style="list-style-type: none"> <li>The size of area subjected to land clearance will be kept to a minimum.</li> <li>Only areas as instructed by the Site Manager, and as approved by this BAR process, must be cleared and grubbed.</li> <li>Cleared vegetation debris will be collected and disposed of to a suitable waste disposal site. It will not be burned on site.</li> <li>No vegetation will be cut or collected off construction sites for burning or for any other purpose without the prior permission of the Site Manager.</li> <li>All vegetation not required to be removed will be protected against damage.</li> </ul>

#### 4.9.6 Plant Repair, Maintenance & Cleaning

Element	Management Plan
<b>Controls</b>	<ul style="list-style-type: none"> <li>Drip trays etc. are to be provided by the contractor, this also applies to the storage of vehicles overnight.</li> <li>All emergency repair work away from bunded areas will make use of drip trays.</li> <li>Regular inspections will be carried out to detect leaks and spillages on vehicles and machinery.</li> </ul>

## 4.10 Noise

Element	Management Plan
<b>Potential Impact</b>	Nuisance noise from construction activities affecting the surrounding areas
<b>Sources</b>	<ul style="list-style-type: none"> <li>• Site preparation and earthworks (workshop area)</li> <li>• Construction related transport and Building activities</li> </ul>
<b>Controls</b>	<ul style="list-style-type: none"> <li>• Noise control measures must be implemented by the contractor. All noise levels must be controlled at the source.</li> <li>• All employees must be given the necessary ear protection gear, where necessary.</li> <li>• Affected parties must be informed of any excessive noise factors.</li> <li>• No loud music is allowed on site and in construction camps.</li> <li>• All construction vehicles on site, will maintain the speed limits prescribed by the power station, in order to limit additional noise and dust generated by these vehicles.</li> <li>• The ECO will be advised in advance when unavoidable out-of-hours work will occur.</li> <li>• Noise from vehicles and on-site powered machinery and equipment will not exceed the manufacturer's specifications, based on the installation of noise attenuation measures.</li> </ul>
<b>Maintenance</b>	<ul style="list-style-type: none"> <li>• All construction equipment must be maintained in good working order.</li> <li>• Silencers on construction equipment will be maintained to ensure no deterioration in noise-dampening capacity.</li> </ul>
<b>Corrective Actions</b>	<ul style="list-style-type: none"> <li>• The Contractor will respond timeously in the event of any complaints by local residents or others about disturbing noise. The noise source will be identified and appropriate noise mitigatory measures instituted in consultation with the affected party(ies).</li> <li>• In the case of legitimate complaints the noise level must be tested by a specialist</li> </ul>

## 4.11 Air Pollution Management

### 4.11.1 Air Quality

Element	Management Plan
<b>Sources</b>	<ul style="list-style-type: none"> <li>• Construction Dust</li> <li>• Unintentional Fire</li> <li>• Construction Vehicle emissions</li> </ul>
<b>Controls</b>	<ul style="list-style-type: none"> <li>• All activities on-site must comply with the requirements of the National Environmental Management: Air Quality Act (Act 39 of 2004).</li> <li>• Burning of materials including wood, grass and refuse which emit visible smoke will not be permitted on construction sites.</li> <li>• No open fires are to be allowed on site.</li> <li>• Speed limits must be enforced in all areas, including public roads and private property to limit the levels of dust pollution</li> <li>• Dust dispersion from construction activities, unsurfaced roads, spoil dumps and other construction locations will be limited and suppressed to the maximum extent practical.</li> <li>• An appropriate freeboard will be maintained in trucks hauling dirt, sand,</li> </ul>

Element	Management Plan
	soil and other loose material when leaving the road reserve.
<b>Maintenance</b>	<ul style="list-style-type: none"> <li>The Contractor will ensure that all vehicles and machinery are fitted with appropriate emission control equipment, are maintained frequently and serviced to the manufacturers' specifications.</li> </ul>
<b>Corrective Actions</b>	<ul style="list-style-type: none"> <li>If monitoring results or complaints indicate inadequate compliance with the EMP, the source of the problem must be identified and existing procedures or equipment modified to ensure that the problem is rectified.</li> </ul>

## 4.12 Water Management

### 4.12.1 Water for Domestic Use

The Contractor will implement measures to ensure that the construction workforce present on the site has access to sufficient potable water.

Element	Management Plan
<b>Controls</b>	<ul style="list-style-type: none"> <li>Contractors must ensure construction crews are provided with an appropriate portable water supply, safe and healthy sanitary facilities and protection against exposure to environmentally dangerous or unhealthy situations or conditions.</li> </ul>

### 4.12.2 Water Consumption

Element	Management Plan
<b>Controls</b>	<ul style="list-style-type: none"> <li>The contractor must create awareness and encourage the construction workforce to use water sparingly such that there is no water wastage.</li> <li>The contractor will not make use of/collect water from any other source than those pointed out to them as suitable for use.</li> </ul>

### 4.12.3 Water Pollution Management

Element	Management Plan
<b>Controls</b>	<ul style="list-style-type: none"> <li>The contractor must ensure that working areas where hazardous substances (such as vehicle fuels) are handled or stored are designed to collect and contain these hazardous substances.</li> <li>The contractor must ensure that no pollution enters surface water or has the potential to pollute groundwater by ensuring that there is containment of spillages (e.g. diesel, oils, etc) and that there is an emergency plan in place to deal with accidental spillage.</li> <li>The contractor must ensure that washing of containers, equipment, vehicles and other surfaces only occurs at designated washing areas (use to be made of existing Eskom facilities).</li> <li>The contractor must ensure that all fuel, chemical, oil, etc spills are confined to areas where the drainage of water can be controlled and managed to confine spillages such that they do not interfere with stormwater and groundwater (referred to as 'clean water').</li> </ul>

## 4.13 Soil Management

### 4.13.1 Topsoil

Element	Management Plan
<b>Controls</b>	<ul style="list-style-type: none"> <li>The Contractor is required to strip topsoil together with grass from all areas where permanent or temporary structures are located, construction related activities occur, and access roads are to be constructed. Topsoil must be stockpiled for later use.</li> <li>Topsoil stripping will be scheduled for the dry season, as far as possible.</li> <li>Topsoil is to be handled twice only - once to strip and stockpile, and secondly to replace, level, shape and scarify.</li> <li>Topsoil must not be compacted in any way, nor should any object be placed or stockpiled upon it. No vehicles may be allowed access onto the stockpiles after they have been placed</li> <li>Stockpiled topsoil must be either vegetated with indigenous grasses or covered with a suitable fabric to prevent erosion and invasion by weeds.</li> </ul>
<b>Maintenance</b>	<ul style="list-style-type: none"> <li>As far as possible, stored topsoil will be free of deleterious matter such as large roots, stones, refuse, stiff or heavy clay and noxious weeds which would adversely affect its suitability for planting.</li> </ul>

### 4.13.2 Erosion Control

Element	Management Plan
<b>Controls</b>	<ul style="list-style-type: none"> <li>Areas susceptible to erosion must be protected by installing the necessary temporary and/or permanent drainage works as soon as possible.</li> <li>Blocking of stormwater drainage systems must be prevented and storm water must be managed to prevent soil erosion.</li> <li>All cleared areas will be promptly rehabilitated and in accordance with specific instructions from the Site Manager.</li> <li>Soil must be exposed for the minimum time possible once cleared of invasive vegetation. The timing of clearing and grubbing must be co-ordinated as much as possible to avoid prolonged exposure of soils to wind and water erosion.</li> </ul>

## 4.14 Waste Management

Element	Management Plan
<b>Sources</b>	<ul style="list-style-type: none"> <li>Packaging</li> <li>Construction wastes</li> <li>Storage of oils and fuels</li> <li>Domestic waste</li> </ul>
<b>Controls</b>	<ul style="list-style-type: none"> <li>Waste management on site is to be in accordance with Eskom's existing waste management procedures - see attached in <b>Appendix A</b>.</li> </ul>

Element	Management Plan
	<ul style="list-style-type: none"> <li>Where possible, construction wastes on site must be reused or recycled</li> <li>The Contractor must familiarise themselves with the definitions of waste and the handling, storage and transport of it as prescribed in the applicable environmental legislation.</li> </ul>
<b>Corrective actions</b>	<ul style="list-style-type: none"> <li>A complaints register must be maintained, in which any complaints from the community must be logged. All complaints must be investigated and, if appropriate, acted upon</li> <li>Corrective actions are required to be undertaken immediately after a complaint is made or a non-conformance is identified.</li> </ul>

#### 4.15 Storage and Handling of Hazardous Substances

Element	Management Plan
<b>Controls</b>	<ul style="list-style-type: none"> <li>Hazardous Waste Management on site is to be in accordance with Eskom's existing waste management procedures - see attached in <b>Appendix A</b>.</li> <li>The contractor must store all hazardous substances (including oils, fuels, chemicals, etc.) in a manner prescribed in the relevant Acts and Regulations.</li> <li>Any spills will be rendered harmless and arrangements made for appropriate collection and disposal including cleaning materials, absorbents and contaminated soils.</li> </ul>
<b>Maintenance</b>	<ul style="list-style-type: none"> <li>Any accidental chemical/fuel spills to be corrected immediately.</li> <li>Keep MSDS records of chemicals in use up to date.</li> <li>Implement appropriate actions and measures to reduce, stop or contain a spill of potentially hazardous substances.</li> <li>Implement appropriate actions and measures to reduce or prevent contamination of the ground and surface water as a result of a spill of potentially hazardous substances</li> </ul>
<b>Corrective Actions</b>	<ul style="list-style-type: none"> <li>A complaints register must be maintained, in which any complaints from the community must be logged. All complaints must be investigated and, if appropriate, acted upon</li> <li>Keep written records detailing the type of spill, the corrective and remedial measures implemented in the stopping or reduction of the spill, and the clean up of the spill. Such progress reporting is important for monitoring and auditing purposes and the written reports may afterwards be used for training purposes in an effort to prevent similar future occurrences.</li> <li>Report the nature and extent of the spill to the ECO, and Site manager as soon as possible.</li> <li>The ECO will prescribe measures to be implemented in order to prevent spills of potentially hazardous substances.</li> </ul>

**4.15.1 Cement and Concrete**

<b>Element</b>	<b>Management Plan</b>
<b>Controls</b>	<ul style="list-style-type: none"> <li>• Concrete must be mixed only in an area demarcated for this purpose. All concrete spilled outside this area, must be promptly removed by the Contractor and taken to a permitted waste disposal site. After all concrete mixing is complete all waste concrete must be removed from the batching area and disposed of at an approved waste disposal site.</li> <li>• Waste concrete and cement sludge must be scraped off the site of the batching plant and removed to a suitable disposal site. (To prevent pollution during the rain).</li> <li>• Solidified concrete can be disposed of at a suitable disposal site.</li> <li>• Concrete must not be mixed directly on the ground. Plastic liners or mixing trays are to be used.</li> </ul>

**4.15.2 Fuel storage**

<b>Element</b>	<b>Management Plan</b>
<b>Controls</b>	<ul style="list-style-type: none"> <li>• All legal compliance requirements with respect to Fuel storage and dispensing must be met.</li> <li>• All fuel storage tanks (temporary or permanent) and associated facilities must be designed and installed in accordance with the relevant oil industry standards, SANS codes and other relevant requirements.</li> <li>• Areas for storage of fuels and other flammable materials must comply with standard fire safety regulations and may require the approval of the Municipal Fire Prevention Officer.</li> <li>• Symbolic safety signs depicting "No Smoking", "No Naked Flames" and "Danger" are to be prominently displayed in and around the fuel storage area.</li> <li>• The capacity of the fuel storage tanks must be clearly displayed and the product contained within the tank clearly identified.</li> <li>• There must be adequate fire- fighting equipment at the fuel storage and dispensing area or areas.</li> <li>• Tanks must be situated in a bunded area, the volume of which must be at least 110% of the proposed volume of the tank.</li> <li>• The floor of the bunded area must be smooth and impermeable, constructed of concrete or plastic sheeting with impermeable joints with a layer of sand over to prevent perishing. The floor of the bunded area will be sloped towards an oil trap or sump to enable any spilled fuel and/or fuel –soaked water to be removed.</li> <li>• Any water that collects in the bund must not be allowed to stand and must be removed and the hydrocarbon digestion agent within must be replenished.</li> <li>• Only empty and externally clean tanks may be stored on the bare ground. All empty and externally dirty tanks must be sealed and stored on an area where the ground has been protected.</li> <li>• Any electrical or petrol-driven pump must be equipped and positioned so as not to cause any danger of ignition of the product.</li> </ul>

Element	Management Plan
	<ul style="list-style-type: none"> <li>All waste fuel and chemical impregnated rags must be stored in leak-proof containers and disposed of at an approved hazardous waste site.</li> </ul>
<b>Maintenance</b>	<ul style="list-style-type: none"> <li>Regular inspections will be carried out to detect leaks and spillages. All storage facilities will be maintained as regularly as is necessary to ensure they meet the original specification. Inspections will be carried out on a daily, weekly and monthly basis by the ECO.</li> <li>All equipment that leak oil or fuel must be repaired immediately or removed from the construction site</li> </ul>
<b>Corrective Actions</b>	<ul style="list-style-type: none"> <li>Absorbent material must be available at tanks to absorb any spills</li> </ul>

#### 4.16 Traffic and Transport

Element	Management Plan
<b>Potential Impacts</b>	<ul style="list-style-type: none"> <li>Traffic, and thus accident potential, increase at the proposed access point</li> <li>Traffic, and thus accident potential, increase on neighbouring roads</li> </ul>
<b>Controls</b>	<ul style="list-style-type: none"> <li>A responsible person must be given the duty of monitoring the traffic and to see that the correct and sufficient warning signs are in place.</li> <li>Creation of designated access to the proposed site to ensure safe entry and exit.</li> <li>Transport of all hazardous substances must be in accordance with the relevant legislation and regulations.</li> <li>All drivers will be in possession of an appropriate valid driver's license.</li> <li>All maintenance vehicles travelling on public roads will adhere to the specified speed limits.</li> <li>Moderate speeds (i.e. as per the power station's speed limits) will be employed and adhered to on all access/service roads.</li> <li>The movement of all vehicles will be controlled such that they remain on designated routes.</li> <li>No member of the workforce will be permitted to drive a vehicle under the influence of alcohol or narcotic substances.</li> <li>No deviation from approved access roads will be allowed. If necessary, new access routes can be designed, but must initially be approved by the ECO.</li> <li>Traffic control mechanisms must be implemented to limit vehicle entrained dust from unpaved roads.</li> </ul>
<b>Maintenance</b>	<ul style="list-style-type: none"> <li>Appropriate maintenance of all vehicles</li> <li>Appropriate maintenance of access roads</li> </ul>
<b>Corrective Actions</b>	<ul style="list-style-type: none"> <li>Visual monitoring of dust produced by traffic in order to minimise dust emissions</li> <li>Visual monitoring of traffic control measures to ensure they are effective</li> <li>A complaints register must be maintained, in which any complaints from the community must be logged. All complaints must be investigated and, if appropriate, acted upon.</li> </ul>



**4.17 Site Clean -up**

<b>Element</b>	<b>Management Plan</b>
<b>Controls</b>	Workshop area – if required: <ul style="list-style-type: none"><li>• The contractor must ensure that all temporary structures, materials, waste and facilities used for construction activities are removed upon completion of the project.</li><li>• The contractor must fully rehabilitate (e.g. clear and clean area, rake, pack branches etc) all disturbed areas and protect them from erosion.</li><li>• Only indigenous plants that adapted to the local conditions must be considered for rehabilitation purposes.</li></ul>

## 5 OPERATION AND MAINTENANCE

The operation and maintenance of the fabric filter plant must comply with the Grootvlei Power Station's ISO certification processes.

### 5.1 Labour

#### 5.1.1 Conduct of Employees

The following restrictions or constraints will be placed on the operation and maintenance staff in general:

- No indiscriminate disposal of rubbish or rubble.
- No littering.
- All Eskom safety, health and environmental procedures will be complied with.

### 5.2 Hazard and Risk

Element	Management Plan
<b>Actions/Controls</b>	<ul style="list-style-type: none"> <li>• When construction is complete, the Risk Management and Emergency Response Procedures at the power station must be updated to include the Fabric Filter Plants.</li> <li>• On-site and off-site emergency plans</li> <li>• Monitoring</li> <li>• Incident and reporting</li> <li>• Community consultation and information</li> </ul>
<b>Maintenance</b>	<ul style="list-style-type: none"> <li>• Regular checks and drills must be conducted to ensure that the risk and hazard control strategies are maintained.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>• All monitoring will occur according to the risk management and emergency response procedures.</li> <li>• A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon.</li> </ul>
<b>Corrective Actions/Reporting</b>	<ul style="list-style-type: none"> <li>• If an emergency report or emergency drill indicates an error/omission in risk and hazard management procedures, then procedures must be altered or updated to ensure effective management.</li> <li>• If an incident occurs, then emergency procedures must be enacted to ensure all impacts are minimized.</li> </ul>

### 5.3 Noise

Element	Management Plan
<b>Actions/Controls</b>	<ul style="list-style-type: none"> <li>• In order to reduce the overall noise emission to acceptable levels, final design of equipment will ensure the level of noise emission from the plant must be limited to levels guaranteed by the contractor.</li> <li>• All noise from activities during operation and maintenance must be within acceptable limits (according to the Environment Conservation Act and the National Environmental Management Act), taking into</li> </ul>

Element	Management Plan
	consideration that maintenance activities may be required outside of working hours, for example, in the case of emergencies.
<b>Maintenance</b>	<ul style="list-style-type: none"> <li>All plant and equipment, including vehicles, must be properly maintained in order to minimise noise generation.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>Observation of on-site noise levels by the station's Environmental Officer (EO)</li> <li>A complaints register must be held, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon.</li> </ul>
<b>Corrective Actions/Reporting</b>	<ul style="list-style-type: none"> <li>Corrective action is required to be undertaken immediately after a complaint is made or non-conformance is identified.</li> <li>Any complaints regarding noise must be investigated, sources identified and mitigation measures implemented. Feedback on resolution of the issue must be provided to the complainant.</li> <li>The EO will maintain an incident reporting system to record non-conformances.</li> </ul>

#### 5.4 Air Pollution Management

Element	Management Plan
<b>Maintenance</b>	<ul style="list-style-type: none"> <li>All equipment must be maintained according to industry standards. This will ensure that emissions continue to fall within guideline levels.</li> <li>Roads must be sealed and maintained to ensure that dust from road or vehicle sources will not exceed prescribed levels.</li> <li>Ensure incident and complaint registers are established and maintained.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>Monitoring must be undertaken to ensure emissions are not exceeding the legal limits.</li> <li>A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, of appropriate acted upon.</li> </ul>
<b>Corrective Actions/Reporting</b>	<ul style="list-style-type: none"> <li>If monitoring results or complaints indicate inadequate performance, then the source of the problem must be identified, and existing procedures or equipment modified to ensure the problem is rectified.</li> <li>The Environmental Office is to keep an environmental incident reporting system to record non-conformances.</li> </ul>

#### 5.5 Water Management

Element	Management Plan
<b>Controls/actions</b>	<ul style="list-style-type: none"> <li>Potentially contaminated water must be directed to the pollution control dams.</li> <li>Spills of potential contaminants must be immediately cleaned up and neutralised. Such spills must be handled with consideration to health and safety considerations.</li> <li>The use of water to clean up spills must be avoided except where absolutely necessary.</li> <li>Spill kits must be made available on site for the clean up of spills and</li> </ul>

Element	Management Plan
	<p>leaks of contaminants.</p> <ul style="list-style-type: none"> <li>Spill response procedures to include removal/disposal of potentially contaminated water and any used absorbent materials.</li> </ul>
<b>Maintenance</b>	<ul style="list-style-type: none"> <li>The surface and ground water quality control structures used on site must be monitored and maintained in a fully operational state at all times.</li> <li>Ensure incident/complaint registers are established and maintained.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>Monitoring program used should be an extension of the existing monitoring program at Eskom.</li> </ul>
<b>Corrective Actions/reporting</b>	<ul style="list-style-type: none"> <li>Corrective action is required to be undertaken immediately of a complaint is made, or potential/actual leak or spill of polluting substance identified. This includes stopping the contaminant from further escaping, cleaning up the effected environment as much as practically possible and taking preventative measures.</li> </ul>

## 5.6 Waste management

Element	Management Plan
<b>Actions/Controls</b>	<ul style="list-style-type: none"> <li>Ensure compliance with Eskom's existing Waste Management Procedures (<b>Appendix A</b>).</li> <li>Ensure that care is taken to ensure that spillages of any hazardous substances are limited during maintenance. Should any accidental spillage take place, it must be cleaned up according to specified standards regarding bioremediation.</li> <li>General Waste <ul style="list-style-type: none"> <li>* Recycled where possible or disposed of properly to a licensed landfill</li> </ul> </li> <li>Hazardous Waste <ul style="list-style-type: none"> <li>* Separate hazardous and general waste and dispose hazardous waste to an appropriately licensed hazardous waste disposal site.</li> </ul> </li> </ul>
<b>Maintenance</b>	<ul style="list-style-type: none"> <li>Uncontaminated waste must be removed at least weekly for disposal</li> <li>Contaminated or regular wastes must be disposed of as necessary and in accordance with legislation</li> <li>An incident/complaint register must be established and maintained</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>Visual inspection of the site must be carried out daily for evidence of litter or waste material that has been inappropriately disposed of by site personnel</li> <li>Waste collection must be monitored on a regular basis</li> <li>A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon.</li> </ul>
<b>Corrective Actions/Reporting</b>	<ul style="list-style-type: none"> <li>Corrective action is required to be undertaken immediately after a complaint is made or non-conformance is identified.</li> <li>Upon the identification of any non-conformance, appropriately feasible remediation measures must be determined and implemented.</li> <li>An incident reporting system will record and manage follow up of resolution of non-conformances</li> </ul>

## **6 DE-COMMISSIONING**

### **6.1 General Principles for Environmental Management during Decommissioning**

At this point of the project planning process, the necessity for and timing of the decommissioning of the new Fabric Filter Plants is not known. It is assumed that decommissioning will commence once the Life of the Power Station has been reached, and will be undertaken as part of the station decommissioning processes. Decommissioning will be undertaken as required by the Power Station's closure objectives. These objectives may be required to be re-visited and supplemented closer to closure. In order to minimise the extent of rehabilitation activities required during the decommissioning phase, Eskom continuously ensures that constant effort is applied to rehabilitation activities throughout the life of the Power Station.

# **Appendix A:**

## **Existing Waste Management Procedures**